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HIV in the European Region

Using Evidence to Strengthen Policy and Programmes

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THE CENTRE FOR RESEARCH ON DRUGS AND HEALTH BEHAVIOUR

HIV Epidemics in the European Region: Vulnerability and Response

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Abbreviations

AIDS	Acquired immune deficiency virus
ART	Anti-retroviral therapy
AOR	Adjusted odds ratio
CAR	Central Asian Republics
CI	Confidence interval
ECDC	European Centre for Disease Control
EMCCDA	European Monitoring Centre for Drugs and Drug Addiction
EMIS	European Men's Internet Survey
EU	European Union
EE	Eastern Europe
FSU	Former Soviet Union
FSW	Female sex worker
GNI	Gross national income
HAART	Highly active anti-retroviral therapy
HIV	Human Immunodeficiency virus
HCV	Hepatitis C virus
ICRSW	International Committee on the Rights of Sex Workers
IDU	Injecting drug user
LGBT	Lesbian, gay, bisexual, transgender
Monitoring	Measurement over time using a repeated study or through multiple separate studies employing comparable methodologies
MSM	Men who have sex with men
MSW	Male Sex Worker
NGO	Non-governmental organisation
NSP	Needle Syringe Programme
OR	Odds ratio
OST	Opiate substitution therapy
PLHIV	People living with HIV
PWID	People who inject drugs
RDS	Respondent driven sampling
SW	Sex worker
STI	Sexually transmitted infection
SWAN	Sex Workers' Advocacy Network
TAMPEP	European Network for HIV/STI Prevention and Health Promotion among Migrant Sex Workers

TESSy	The European Surveillance System
TLS	Time location sampling
UAI	Unprotected anal intercourse
UNGASS	United Nations General Assembly Special Session
UVI	Unprotected vaginal intercourse
VCT	Voluntary counselling and testing
WHO	World Health Organization

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Executive Summary

European Region Countries

This report covers the following 53 countries of the WHO European Region and Lichtenstein:

West: Andorra, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Liechtenstein, Luxembourg, Malta, Monaco, The Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland, United Kingdom

Centre: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Hungary, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia, The former Yugoslav Republic of Macedonia, Turkey

East: Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine, Uzbekistan

HIV in Europe

Despite decreases in the rate of spread in the last decade, the number of new HIV diagnoses in Europe continues to increase, and by 2011, reached over 1.2 million individuals, with over half a million diagnoses reported in the last five years. Between 2006 and 2010, there have been an average of 127 new diagnoses each year per million people in Europe. Our review of national case reports indicates that the continuing increase in new HIV cases in Europe is fuelled by epidemics in the East. Whereas, an average of 74 and 11 new diagnoses per million were reported in the West and Centre between 2006 and 2010, there were 273 per million people in the East. In this time period, new diagnoses have been relatively stable in the West and Centre, but increasing (by around 30%) in the East, with the highest rates of new diagnoses in Estonia, Russian Federation and Ukraine. The proportion of cases among women are declining in the West and Centre, but remain consistent in the East (at 41%).

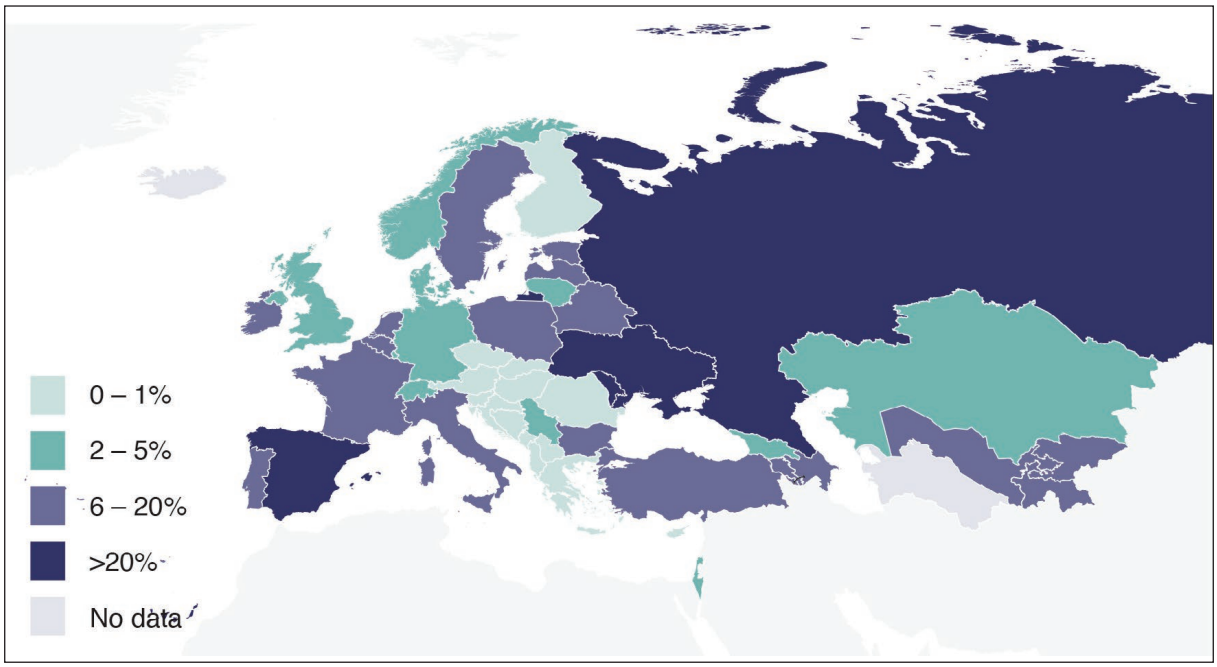
HIV diagnoses and prevalence among key populations

Between 2006 and 2010, 25% of case reports in Europe were associated with injecting drug use, with higher proportions in the East (33%) than West (5%) and Centre (7%). Whereas there was an annual average of 89 reported HIV diagnoses associated with injecting drug use per million people in the East in this five year period, there were 3.6 per million in the West and 0.8 per million in the Centre. The countries with the highest levels of reported diagnosed cases among people who inject drugs (PWID) in Europe were the Ukraine (153 per million people), Russian Federation (98 per million people), and Kazakhstan (78 per million people).

Findings from HIV prevalence studies show that prevalence among PWID is highest in Estonia (55.3%), Spain (34.5%), Russian Federation (28.9%), Republic of Moldova (28.6%) and Ukraine (22.9%) (see Figure 1). Our review of multivariate risk factors linked to HIV among PWID shows that a history of injecting with previously used injecting equipment, injecting with greater frequency, and a longer history of injecting were linked to HIV. When aggregated across multivariate studies, being of female sex emerges as a risk factor.

Heterosexual exposure was the reported risk factor for 29% of HIV diagnoses in the region. There has been a slight decline in the proportion of cases attributed to heterosexual exposure as well as the number of HIV cases in the West, both have remained stable in the Centre and increased in the East. During the period the annual average per million population was 74 in the West, 11 in the Centre and 273 in the East. The countries with the highest levels of reported cases in Europe were Ukraine (161 per million people), Republic of Moldova (145 per million people) and Portugal (91 per million people). The highest proportion of cases with heterosexual exposure among women was reported in the East (60%), then in the West (50%) and lowest in the Centre (43%). The proportion of reports among people aged 30 years or less at diagnosis declined in all three sub-regions.

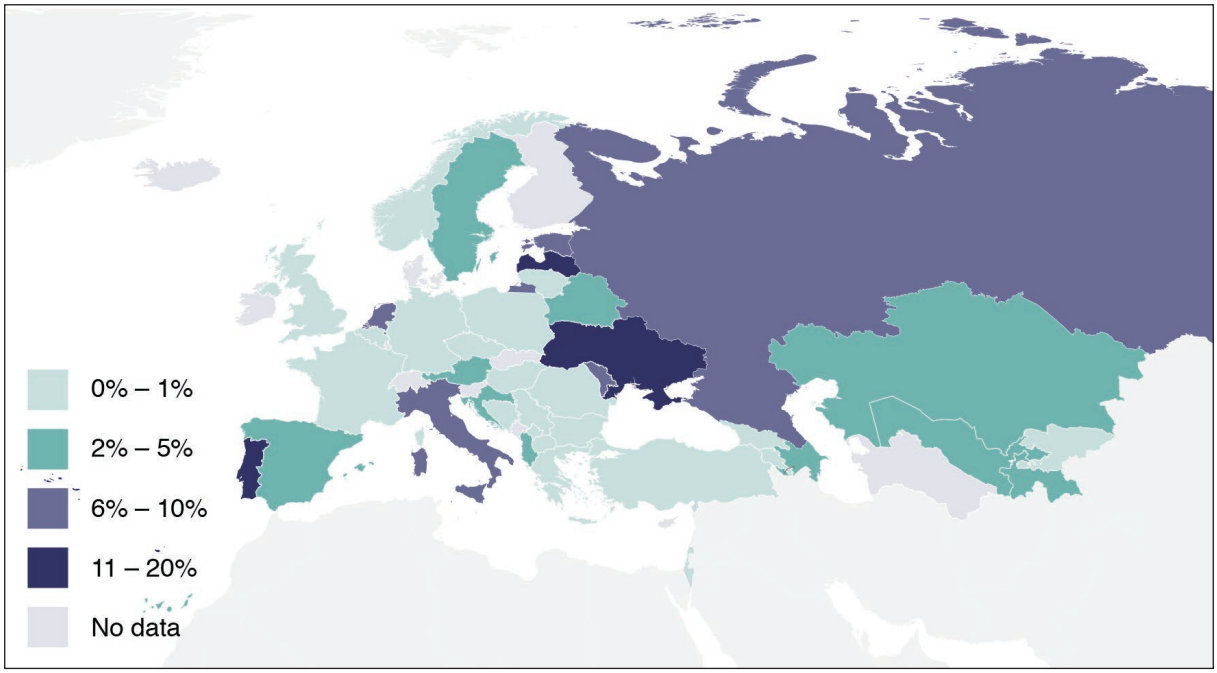
ES Figure 1 Average HIV case prevalence among people who inject drugs across Europe (2006 – 10)



Source: Appendix 2.A.6.

With few exceptions, European countries do not collate risk factor information concerning sex work as part of case reporting. Our review of HIV prevalence studies shows that HIV remains low among female sex workers (FSWs) who do not inject drugs, at less than 1% in the West. [1 – 12] HIV prevalence among female SWs in the East is generally higher than in the West and Centre, ranging from around 2% to 8% (ES Figure 2). Our review shows a clear relationship between higher HIV prevalence and higher prevalence of injecting drug use among SWs. In the West, HIV prevalence is higher among male and transgender sex workers than FSWs, irrespective of injecting drug use, reflecting the higher prevalence of HIV among men who have sex with men (MSM), the main client group of male sex workers (MSWs).

ES Figure 2 Prevalence of HIV among female sex workers in Europe (2006 – 10)



Source: Appendix 2.A.6.

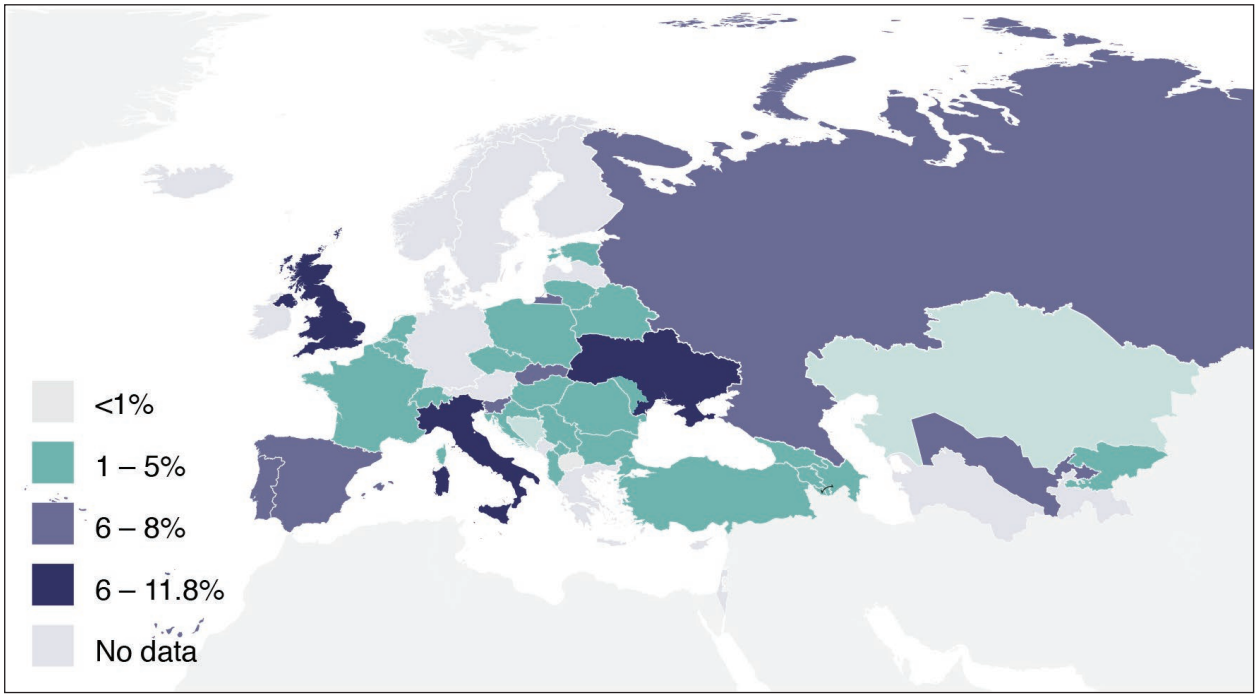
Case reporting data shows that sex between men was reported for 10% of all HIV diagnoses in Europe, and higher in the West (36%), than Centre (22%) or East (0.5%). Between 2006 and 2010, the annual average number of diagnoses linked to sex between men per million people was 27 in the West compared with 2.5 in the Centre and 1.4 in the East, and highest in United Kingdom (43.4), Netherlands (43) and Spain (37.3) (ES Figure 3). But the Centre and East have witnessed marked increases in the number of reported diagnoses associated with sex between men in the last five years. Despite these increases our findings suggest that case reports remain under-reported in this region among MSM. An indication of the extent of under-reporting can be seen in the high numbers of case reports with no known exposure group (including in the Russian Federation, Estonia and Poland) which may reflect MSM-associated cases hidden due to social and legislative issues related to homosexuality.

Our review also shows that estimates of HIV prevalence among samples of MSM are highest in the West, but vary from as low as 1.6% in Switzerland to nearly 20% in Spain. We also noted a relative lack of targeted HIV prevalence and risk behaviour surveys among MSM throughout the region. Our review of multivariate analyses investigating HIV risk factors among MSM linked HIV to inconsistent condom use, unprotected anal intercourse, and a history of STIs. Findings from our systematic review also suggest that the epidemics among MSM in the West may be perpetuated by a core group of MSM and HIV positive MSM engaging in high risk behaviours with a high number of sex partners. [13 – 14]

The evidence shows that HIV epidemics of Europe are greatest in their burden and momentum in the East, where transmission remains primarily linked to injecting drug use. While the epidemics in the West remain primarily linked to sex between men, we see recent increases in such case reports in the East and Centre. It is important to note that such case report data is only as robust as the HIV surveillance systems producing them. Under-reporting risk status, especially among MSM, is likely in settings where social stigma is greatest, arguably in the East of the region. Our synthesis of case report and HIV prevalence data suggest that the allocation of HIV prevention resources should concentrate upon bolstering and expanding prevention responses targeting PWID and their sexual partners in the East of the region,

introducing prevention responses among MSM in the East and Centre, and reinvigorating prevention responses among MSM in the West.

ES Figure 3 HIV prevalence among men who have sex with men across Europe (2006 – 10)



Source: Appendix 2.A.6.

There is also emerging evidence in Europe of the potential for sexual transmission of HIV among PWID involved in sex work. In Estonia, HIV was not associated with injecting drug use among SWs and they had correspondingly lower prevalence of hepatitis C virus (HCV) suggesting less risky injecting behaviours. [16] A similar pattern has been observed in the Russian Federation: a study showed reduced odds of HCV among women who inject drugs associated with sex work, but increased odds of syphilis pointing to the potential for sexual transmission. [17 – 18] The high prevalence of syphilis reported alongside HIV observed in the Russian Federation, Ukraine, Republic of Moldova and the Central Asian Republics suggests that conditions may exist for increased sexual transmission of HIV among SWs in the East of the region.

We have not reviewed surveillance activities focused on groups that reflect the general population—such as pregnant women or prisoners. Surveillance activities amongst such groups—particularly pregnant women—should be regularly reviewed as they can provide insights into whether an epidemic might be generalising. Monitoring pregnant women may also provide insights into migrants as these often have a higher fertility rate. In countries where there is evidence that indicates generalisation of the epidemic, or the potential for the epidemic to generalise, then surveillance among such groups should be incorporated as a response to the epidemic.

Our review shows that SWs involved in injecting drug use have higher HIV prevalence than SWs who do not inject drugs, and that HIV prevalence among SWs is highest in the East where HIV prevalence is highest among PWID. There is considerable overlap between sex work and drug injecting in the East, with some studies of SWs suggesting that the majority are also PWID, [19] and studies of PWID suggesting that between a quarter and a half have exchanged sex for money or drugs. [20 – 21] Our review finds that SWs who inject drugs are more vulnerable not only to HIV, but also prone to violence, increased problems with mental health, reduced condom use and unwanted pregnancies. [22 – 24] Further, a high proportion of male and transgender SWs report injecting drugs. [25 – 29] HIV prevention interventions need to give priority to targeting the intersection of sex work and injecting drug use.

Taken together, HIV surveillance systems need to increase the accuracy of risk factor data among heterosexual exposures as well as target surveillance among the sexual partners of PWIDs. It is fundamental that HIV prevention responses should integrate sexual health and drug-related health. Among SWs, sexual risk reduction interventions need to better address sexual transmission risk in non-paying and regular relationships. While our review shows consistent condom use with clients is generally the norm among SWs, it is much less common with non-paying partners. Among PWID, sexual health concerns have been eclipsed by an almost exclusive focus on preventing viral transmission liked to the shared use of injecting equipment, and this may be particularly the case in the East, where the potential for onwards sexual transmission appears currently greatest. [30] The majority of PWID in surveys across the region report inconsistent condom use with their regular partners, the majority of whom are non-injectors for male PWID.

HIV and migration

European HIV case reports indicate the potential significance of migration. Among MSM in the West, 5.8% of diagnoses in 2010 were among men who originated from elsewhere in the West and 2.8% were among men from the Centre or East. Among diagnoses in the West associated with injecting drug use, 4.3% originated elsewhere in the West and 20% in the Centre or East. Among cases associated with heterosexual exposure in the West, over a third were among people who originated from a country with a generalised HIV epidemic. Evidence internationally indicates that local and international migration can have important effects in the dynamics of HIV transmission, both among vulnerable groups and in relation to heterosexual exposure. [31 – 33]

There is a pattern among MSM to migrate into the cities, and from cities in the East toward the metropoles of Western Europe. An effect of homophobia in the region is generating mobility among MSM who tend to move or travel to urban centres, considered more gay-friendly and less stigmatising.[25, 34 – 35] The surveys we reviewed suggested that a significant minority of MSM are migrants; up to 15% in many sites. [25, 36 – 38] Studies of MSM in some cities show higher prevalence of HIV among migrant MSM. [39]

In the last twenty years, there are increasing numbers of migrant women working in the European sex industries. In the West, the majority of SWs are migrant women, most of whom are East European and African. Being a migrant emerges in some studies of SWs as a risk factor for HIV, but in others, there is no such association, most likely reflecting the HIV prevalence within country of origin. [2, 33, 40 – 41] A systematic review examining the effect of migration on the risk of HIV among migrant SWs found that there was a higher prevalence of HIV among some FSWs originating from high prevalence countries, likely due to infection at home. However there were no consistent differences in risk highlighting the importance of the local context such as the availability of services to migrants, immigration policies, and local organisation of the sex industry in mediating risk among migrant FSWs. [42]

Taken together, there is a need to better monitor migrant status in HIV surveillance as well as to increase the accessibility of HIV prevention responses to migrant PWID, SWs and MSM, including through the translation of existing materials, and messaging via the internet and travel companies, including those servicing the gay tourist market. [12, 41, 43]

Monitoring and surveillance of HIV among PWID, SW and MSM

During the period 2000 – 2010, HIV surveillance studies were found to be better established among PWID than among SWs and MSM, with very little data available among migrants and male SWs.

Among the 21 countries where HIV prevalence was higher than 5% among PWID, the majority (18) had conducted repeated studies monitoring HIV prevalence and risk behaviour (16) among PWID. HIV prev-

alence and behavioural studies need to be conducted in Ireland and Turkey where no recent surveys had been conducted and no surveys at all were identified in Iceland or Turkmenistan for PWID. In the context of economic decline across the region and the recent outbreaks of HIV in Greece and Romania in part attributed to recession and reduction in services, we recommend vigilance in monitoring HIV case reports as well as one off behavioural/prevalence surveys to anticipate changes in risk behaviours across the region. This is particularly important in countries where prevalence is higher than 5% among PWID, among those hardest hit economically, such as Iceland, Spain and Italy, and in Iceland and Turkmenistan where routine surveillance is not implemented.

Ten countries were identified with high HIV prevalence (>5%) among SWs, and among these, repeated HIV prevalence studies had been conducted in six, and studies to monitor risk behaviours in seven. Studies to monitor HIV or behaviour among FSWs need to be implemented in Portugal and Turkey and improved in Estonia and the Netherlands. This is particularly important given the lack of routine HIV/STI epidemiological data in relation to sex work in Europe. [44] Studies of MSWs were only found in six countries across the region, all these studies found high prevalence of HIV (>5%). Three of these studies were conducted in countries with the highest annual average number of HIV case reports per million (United Kingdom, Netherlands, Spain). Portugal, Switzerland, Denmark, Ireland, Greece, France and Luxembourg also report high numbers of HIV cases among MSM and should consider implementing targeted prevalence studies among male SWs.

Very few countries in the West (2) had undertaken either repeated surveys or studies at different points in time that could be used to monitor prevalence among MSM, while seven countries had done this in the Centre and 10 in the East. Slovakia, Poland, Luxemburg, and Italy, countries of high prevalence (>5%), need to implement repeated targeted studies that could be used to monitor prevalence or risk behaviours.

Our review noted the need for a systematic assessment of the robustness of methods used to monitor HIV prevalence and risk in key populations over time. We also noted the need to expand or introduce repeated studies to measures these, as well as indicators of HIV incidence, in some countries. Establishing mechanisms for repeated measures of HIV prevalence and risk is especially important, as is the development of a centralised portal for the synthesis of such data to enable cross region comparisons. Moreover, HIV surveillance systems provide unrealised opportunities to collate data on indicators of HIV prevention intervention coverage, as outlined in 3rd generation surveillance guidelines.[45] Data on the coverage of combination interventions is especially important. Where feasible, surveillance systems should also be geared towards monitoring indicators of how the social and structural context mediate HIV, for instance, estimating the prevalence of violence among SWs and MSM and of police contact among PWID.

A key challenge in collecting data to inform interventions is the political context in which sex work, drug use and sex between men takes place. In contexts where, for example, sex work is heavily regulated or sex between men is stigmatised, conducting HIV related surveillance studies among people with few rights or representation may create ethical or safety challenges. Proposals for HIV related surveillance studies need to be conducted with full consultation with affected populations, and with appropriate rights protections in place.[44] There are some useful lessons in good surveillance practice in Europe, including for instance, the European Men's Internet Survey (EMIS) among MSM, the sentinel surveillance of HIV and risk among PWID in Spain, the United Kingdom and Italy, and sentinel surveillance among SWs in Central Asia. [40, 46 – 49] All countries within the region should regularly assess and estimate the sizes of the three main key populations at high risk—MSM, PWID and SW. The plausibility of the estimates generated should be assessed robustly by a range of stakeholder including civil society groups from within the populations of interest. The estimation process should be undertaken at least every 10 years.

Our review of surveillance data shows higher rates of HIV testing in the East, especially in the Russian Federation. This may result from mandatory testing of migrants and the practice of 'opt-out' rather than 'opt in' testing polices at various clinic and health service settings as well as an occupational requirement. [50 – 51] Evidence reviewed tends to show the protective effect of HIV testing in reducing HIV risk among PWID and SWs and unprotected anal intercourse (UAI) among MSM, however the cost of this widespread testing of general population groups that occurs in the East should be evaluated. [52] Any increase in HIV testing needs to occur simultaneously with increasing access to treatment and reducing stigma associated with HIV positivity and the removal of structural barriers to employment and discrimination for those diagnosed.

Environmental risk factors shaping HIV risk

Our review points to regional differences, suggesting that levels of risk behaviour among key populations tend to be highest in the East. While the frequency of reported needle or syringe sharing is highly variable across Europe, there are instances of especially high levels of sharing in the East and Central Asia. Among SWs, the systematic review showed that condom use with clients was consistently higher in the West than East or Centre. Among MSM, the highest rates of condom use during anal sex emanate from studies in the West, with rates around 15% higher than those reported in the East. Reports of unprotected anal intercourse are also higher in the East than West or Centre. Most PWID across the region report inconsistent condom use with their regular partners, with a substantial minority reporting inconsistent condom use with their casual partners.

While the epidemiological studies we reviewed rarely explicitly embraced exploration of social determinants, our synthesis of data on HIV risk factors nonetheless points to the potential role of environmental level factors in HIV transmission (Chapter 3). Our discussion of HIV prevention responses (Chapter 4), also highlights that the development and impact of interventions can be shaped by social and structural context.

Our review identified a number of cross-cutting environmental factors as key domains of future social epidemiological research investigating HIV vulnerability in the region: criminalisation of key populations at high risk, drug use and sexual practices; the experience of social stigma and discrimination; migration; gender inequalities; and material inequalities. In our ecological analysis, the strongest and most consistent association we found was a linear relationship between an increased number of people imprisoned per 100,000 population and increased HIV prevalence among PWID and FSWs (Chapters 4.2 and 4.3). Prison, an effect of criminalisation of drug use and sex work, can constitute a risk environment for the acquisition of HIV. This is not an exhaustive list and does not discount the potential importance of multiple other structural factors. Future epidemiological and intervention studies of HIV among key populations need to better systematically delineate how micro-and macro-environmental factors combine to increase or reduce HIV risk.

Among PWID, our review of multivariate studies pointed to unemployment, gender and aspects of the legal environment as potentially important. Regarding gender, women who inject drugs tend to be younger than their male counterparts, engage in higher rates of needle and syringe sharing, and are more likely to share their sex partners' injecting equipment and engage in riskier sexual practices. [53 – 60] Regarding the legal environment, ever having been arrested and ever having spent time in prison emerged as risk factors for HIV. Rates of arrest were high among PWID surveyed, especially in the East. Qualitative studies in the region link police arrest, as well as the fear or experience of police violence with reduced capacity for risk reduction. [61 – 63] There is a need to systematically document the prevalence and contexts of policing practices, including extrajudicial practices, which may violate the human rights

of PWID as well as potentially impact upon their HIV risk reduction capacity. The data also suggest that there is an urgent need to maximise the coverage and intensity of HIV prevention interventions in prison settings. These findings are corroborated by studies internationally. [61 – 62] [64 – 68]

Among SWs, violence emerges as an important contextual determinant of HIV risk, linking to HIV both directly and indirectly. Reported levels of sexual and physical violence among SWs were high, and appeared most common among minority groups (transvestites, Roma) and in the East. [12, 43, 69 – 71] Evidence also points to aggressive policing practices, especially in the East, exacerbating the potential for HIV risk by women having to work longer hours to make up time after arrest, having unprotected sex for more money to make up lost income, and not carrying condoms as they may be used as evidence of sex work. [64, 72 – 73] Explicitly linked to policing is legislation regulating sex work, which is a key structural determinant of violence and HIV risk. The practice of criminalising activities related to sex work can reduce opportunities for communication between SWs and often results in the concentration of sex work into tolerance zones. [74 – 75] The evidence suggests that where sex work is unregulated and accompanied by police corruption, as in the East, results in the most risky environments. [73, 76] Legislation may also influence community attitudes towards SWs with criminalization of sex work reinforcing negative attitudes and violence towards sex workers and hinder the implementation of targeted services as reflected in fewer numbers of targeted services for sex workers in the Russian Federation. [77] [78] Repressive policies will reduce SWs access to HIV services particularly, as often reported in the East, when HIV testing is enforced following detention by police. The punitive approach to HIV testing following arrest or detention must be stopped in the East in favour of facilitating voluntary testing alongside counselling.

Among MSM, the reviewed evidence suggests that social stigma in relation to male homosexuality emerges as a key factor influencing men's capacity for risk reduction efforts. Felt stigma also constrains the potential impacts of HIV surveillance and prevention efforts, disabling HIV prevention help-seeking efforts as well as encouraging under reporting of same sex activity as risk factors in HIV surveillance efforts. Institutionalised social stigma experienced by MSM can be viewed as a form of 'structural violence' mediating HIV risk indirectly as well as directly.

Strengthening HIV prevention among PWID

Findings from our modelling analysis show that high but achievable coverage levels of NSP can result in large decreases (>30%) in HIV incidence and prevalence in settings with high HIV prevalence among PWID. Required coverage levels are much lower when interventions are combined or in lower prevalence settings. The analysis also highlights the importance of combination interventions for reducing HIV incidence and prevalence to low levels in high prevalence settings, with no single intervention (or only at high coverage in the lower prevalence setting of Dushanbe, Tajikistan) being able to reduce HIV incidence to less than 1% or prevalence to less than 10% in 20 years. Modelling shows that when core interventions are delivered in combination, coverage targets become more feasible, although still remain considerable, with about 60% coverage of all three core interventions being required in Tallinn, Estonia and St. Petersburg, Russian Federation over 20 years and about 30% coverage in Dushanbe, to reduce HIV prevalence to less than 10%. The effectiveness of HIV prevention policies depends upon the combined effects of multiple integrated interventions, including HIV testing to identify those in need of antiretrovirals, and bringing these to scale. [79]

Intervention availability and coverage is shaped by the policy and social environment, and we have noted, for instance, how law enforcement, policing practices, and national commitments to HIV prevention can limit HIV prevention coverage potential. We have noted how in the Russian Federation—a setting of a major HIV epidemic—the legal and social environment has constrained, even prohibited, the development of proven-to-be-effective HIV prevention interventions, such as OST. Structural interventions bringing about policy, legal or social change are required to enable sufficient HIV prevention

scale-up, and this is arguably most urgent in the East of the region. The package of combination HIV prevention interventions promoted by WHO and other international agencies as core to national HIV prevention programming (which include NSP, OST and ART) under-emphasises the potential role of social and structural intervention approaches.

Moreover, combination HIV prevention approaches should consider including interventions fostering policy reform as well as legal change. While lacking in rigorous evaluation, interventions targeting changes in the criminal justice environment include: police HIV prevention training and partnerships; developing alternatives to prison programmes, including coerced or mandated entry to drug treatment via community penalties and court orders; the provision of sterile injecting equipment in prisons, which meta-analyses link to no adverse but positive risk reduction effects; the provision of OST in prisons, linked to improved drug treatment outcomes including post release; and interventions enabling legal aid and legal rights literacy to protect against rights violations, though the HIV prevention impact of these remains unknown.

Interventions which bring about change in the legal environment seek to minimise the iatrogenic health effects of the criminalisation of drug users and of the prohibition of HIV prevention interventions. Legal restrictions to the provision of sterile needles and syringes need to be relaxed in order to increase availability and accessibility. HIV risks are in part associated with the criminalization of drug use per se, as increasingly evidenced internationally, [80 – 83] then decriminalizing drug use as a strategy to reduce such harm needs to be considered. [82, 84]

Strengthening HIV prevention among sex workers

The importance of sex worker specific services cannot be overstated – they are important not only in the provision of services and reducing HIV and STIs but also in facilitating access to SWs for monitoring of harms and risk associated with sex work. To date the majority of interventions focus on reducing prevalence of STIs and HIV, outcomes that may have an onward effect on non-sex working communities. The ecological analysis suggests a decrease in HIV prevalence among FSWs with increasing numbers of sex work services that address not only STIs and HIV but broader harms associated with sex work. More interventions are needed which do not focus solely on sexual risk behaviours, STIs and HIV, but rather on broader health outcomes including: reducing violence; unwanted pregnancies; and improving mental and emotional health. These need to be properly evaluated.

Indicators of coverage by SW services across the region was limited. Data on HIV testing suggested that over a third of SWs across the region had been tested for HIV but this may reflect testing following arrest or detainment or as a result of mandatory testing through regulation, as in Greece, rather than voluntary testing. We recommend the routine collation of reported HIV or STI testing at SW services, in order to facilitate an estimate of the effective coverage of services in relation to HIV prevention, taking into account the need for consultation with SWs and protection of privacy. Routinely monitoring condom use with clients and non-paying partners would also give an insight into sexual risk behaviours, as the high prevalence of gonorrhoea underscores the persistent sexual vulnerability of SWs.

New approaches to health service provision are needed across the region to adapt to the changing sex work scene and the increasing number of off-street and migrant SWs. Projects in the United Kingdom have attempted to target off-street populations by conducting outreach on line and contacting women via their websites and circulating frequent emails about services, check up appointments and other information. Catering for the needs of migrant SWs requires the incorporation of translation and interpreters into services particularly in West Europe. In the East, the focus of services has been via existing harm reduction projects and on addressing specific problems relating to drug use and HIV/STI testing rather than broader issues relating to sex work and sexual health. It is fundamental that HIV prevention interventions specifically target SWs, including those not involved in drug use and who may not define themselves as

connected to the sex industry. It is also important that drug and sexual health services are sufficiently integrated to maximize their coverage potential.

Research from Europe and internationally has shown that criminalisation and enforcement-based approaches towards sex work can increase risk of both physical and sexual violence against women, [75, 85 – 86] as well as risk of STIs. [17, 87] Policies and legislation connected to sex work should focus on facilitating safer working environments rather than enforcement approaches that can further marginalise women. Legislation of sex work in Europe is largely characterised by a prohibitive model that may not criminalise the act of selling sex, but criminalises activities around it such as working in groups or running brothels which can limit sex workers' ability to organise their work safely. In countries where sex work is regulated, the benefits of this are denied to migrant sex workers without legal residency rights who are not accorded the same rights as non-migrants. There is evidence that decriminalization of sex work can reduce incidences of violence and improve mental health of sex workers. A long-term strategy needs to decriminalize sex work across the region. Managed street sex work zones have been effective in reducing incidences of violence and providing a safer place to work and should be introduced as a short term strategy.

Reports show that SWs experience violence not only in relation to sex work but by boyfriends, husbands and family. Broader structural interventions to reduce violence among women as a whole is needed as well as targeted interventions for SWs. Policies are needed that address the social welfare of sex workers and social determinants of health such as disparities in employment opportunities, wage, access to welfare and domestic violence. [87 – 88] [89] The inclusion of these kinds of structural interventions often have a knock on benefit of reducing harms among peripheral members of key population groups who may not identify themselves as such. This is of paramount importance in populations as diverse and fluid as sex workers.

Strengthening HIV Prevention among MSM

Effective measures to estimate coverage of services among MSM are urgently needed in order to monitor uptake of services. Standardised indicators are currently lacking across the region. An important finding of the review is that access to mainstream sexual health provision for MSM can be impeded by staff hostility borne out of the dual stigma of homosexuality and HIV, and patient fears concerning breaches of confidentiality. [90 – 92] Such concerns appear more acute in the East. For instance, social stigma appears to act as a deterrent to timely HIV testing and levels of HIV testing are lower in the Centre and East. There is a need to more systematically document how stigma and violence is experienced by MSM, how this affects HIV risk reduction capacity, and to put greater emphasis on stigma reduction initiatives as a core element of HIV prevention programming. Stigma reduction interventions should be promoted throughout all sectors of society and within criminal justice agencies in particular. Protective laws (those against discrimination based on sexual orientation) may assist in prevention efforts through their impact on the perceived acceptability of enacted stigma and should be supported throughout the region.

Our review notes a varied environment in relation to the criminalization and social regulation of homosexuality throughout Europe. Legal changes to decriminalise homosexuality in the parts of the region where such laws remain (Turkmenistan, Uzbekistan) need to be made. Shifts in Western Europe towards recognizing the social inclusion of MSM—for instance, through the legalization of civil partnerships between men—are important social interventions in that they contribute to an enabling context for health and citizenship, including potentially for HIV prevention. Community-level interventions may facilitate some of the social changes required to enable the wider social acceptance of homosexuality, including regarding the day-to-day practices of health, welfare and regulatory institutions, and especially the practices of police and health care professionals. Aside from HIV prevention capacity, our review notes that

HIV surveillance systems are much more likely to correctly attribute transmission of HIV between MSM, and thus better allocate treatments, in settings less socially stigmatized.

Evidence suggests that HIV testing can increase condom use for anal intercourse, [93 – 94] but for HIV-negative men it is a more effective HIV prevention strategy when accompanied by effective counselling on risk reduction. [95] Dedicated MSM-only test facilities are needed in countries where most physicians are inclined to hostility toward MSM. For full impact, it is essential that links are made with other prevention services appropriate to the needs of MSM, particularly in the East where many MSM appear poorly informed of the HIV risks linked to certain practices. [96] Paying for tests and other medical care is a major barrier to uptake and should be discontinued. Condoms should be made freely available in all gay venues and known meeting places required as a condition of local authority licensing to reduce UAI. Additionally, strategies other than a reliance on 100% condom use are needed such as encouraging slower rates of partner change, fewer partners, and especially the avoidance of multiple concurrent partnerships. Concurrency is a key risk factor in the spread of HIV because people are more inclined to use condoms in casual relationships [14, 97], but the establishment and maintenance of trust in a relationship encourages unprotected intimacy and then sets up barriers to honesty about any infidelity. [98 – 99] Other strategies should involve encouraging the practices of sex acts other than anal sex. [100]

In the West, social stigma appears less prominent as a factor shaping access to help and risk reduction, HIV testing is more common, knowledge of the risks posed by UAI is higher, and condoms are widely available. [101 – 102] However, many MSM continue to have unprotected sex frequently with casual partners. In a context of the widespread availability of HAART, there may also be a misplaced reliance on negative HIV results when selecting sex partners. [103 – 104] Interventions need to question how strategies of 'serosorting' are applied in practice, for they may promote a false sense of security and counselling alongside HIV testing is necessary to address any misconceptions regarding the safety of relying upon recent HIV-negative test results as a rationale for unprotected sex.

Complacency about infection and treatment availability complicates prevention messages in the West. There is some evidence that good adherence to HAART can reduce viral load to undetectable levels, and that HAART therefore acts as HIV prevention. [105 – 106] Patients with undetectable viral load may have detectable virus in semen and therefore be infectious. [107 – 109] Many of the studies providing the evidence of effectiveness of treatment as prevention are based on mathematical modelling rather than observed data, which are highly sensitive to the parameters and underlying assumptions of the model, while the remainder are ecological studies which overall give mixed results and are unable to demonstrate causality. [105 – 106, 110 – 111] An assumption that treatment is protective is particularly problematic in the case of MSM, given that the per-act probability of transmission is so much higher for anal sex [112] than for vaginal sex, [113] and that partner numbers are typically higher. The promotion of HIV treatment as a strategy for HIV prevention in Europe needs, therefore, to be approached with some caution.

One difficulty with the targeting of HIV prevention in parts of the European region is that it tends to be based on 'Western' models of experience, and these tend historically to be based on interventions targeting homosexually-identified men. Such approaches may tend to over-include men who perform mainly or only the receptive role, since those who tend to take the insertive role may be more likely to identify themselves as heterosexual. [114] It is fundamentally important to recognize the heterogeneous nature of populations of MSM and to tailor interventions accordingly in different parts, and local settings, of Europe. MSM HIV prevention programmes need to go beyond gay-scene settings (bars, clubs, saunas, shops) to reach a significant and diverse proportion of the population. Websites for MSM are an essential part of HIV prevention programmes since they are used both by men who use gay-scene and those who do not. Thirdly, educational mass media messaging targeting all sexually active men can also be designed to be of benefit to MSM through sensitive use of language and imagery. [91]

References

[1] European Centre for Disease Prevention and Control, *Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report*. 2010, ECDC: Stockholm.

[2] Belza, M.J., Prevalence of HIV, HTLV-I and HTLV-II among female sex workers in Spain, 2000 – 2001. *European Journal of Epidemiol*, 2004. 19(3): p. 279 – 82.

[3] Cwikel, J.G., et al., Sexually transmissible infections among illegal female sex workers in Israel. *Sexual Health,* 2006. 3(4): p. 301 – 303.

[4] Folch, C., et al., Prevalence of human immunodeficiency virus, Chlamydia trachomatis, and Neisseria gonorrhoeae and risk factors for sexually transmitted infections among immigrant female sex workers in Catalonia, Spain. *Sexually Transmitted Diseases,* 2008. 35(2): p. 178 – 183.

[5] Gutierrez, M., et al., Prevalence of HIV-1 non-B subtypes, syphilis, HTLV, and hepatitis B and C viruses among immigrant sex workers in Madrid, Spain. *Journal of Medical Virology*, 2004. 74(4): p. 521 – 7.

[6] Linhart, Y., et al., Sexually transmitted infections among brothel-based sex workers in Tel-Aviv area, Israel: high prevalence of pharyngeal gonorrhoea. *International Journal of STD & AIDS,* 2008. 19(10): p. 656 – 9.

[7] Nigro, L., et al., Prevalence of HIV and other sexually transmitted diseases among Colombian and Dominican female sex workers living in Catania, eastern Sicily. *Journal of Immigrant and Minority Health*, 2006. 8(4): p. 319 – 323.

[8] Papadogeorgaki, H., et al., Prevalence of sexually transmitted infections in female sex workers in Athens, Greece – 2005. *European Journal of Dermatology,* 2006. 16(6): p. 662 – 665.

[9] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working sex workers in London: the effect of migration from Eastern Europe. In press, 2011.

[10] Vall-Mayans, M., et al., Sexually transmitted Chlamydia trachomatis, Neisseria gonorrhoeae, and HIV-1 infections in two at-risk populations in Barcelona: female street prostitutes and STI clinic attendees. *International Journal of Infectious Diseases,* 2007. 11(2): p. 115 – 122.

[11] EuroHIV, HIV/AIDS Surveillance in Europe. *Mid-year report 2006*, in HIV/AIDS Surveillance in Europe, EuroHIV, Editor. 2007, French Institute for Public Health Surveillance: Saint-Maurice.

[12] Nielsen, S., et al., STI rates and risk factors among female sex workers attending STI testing sites in Germany, in International Society for Sexually Transmitted Disease Research. 2011: Quebec.

[13] Leobon, A., et al., A relative profile of HIV-negative users of French websites for men seeking men and predictors of their regular risk taking: a comparison with HIV-positive users. *AIDS Care,* 2011. 23(1): p. 25 – 34.

[14] Balthasar, H., et al., Intentional Risk Reduction Practices of Men in Switzerland Who Have Anal Intercourse With Casual Male Partners. *AIDS Journal of Acquired Immune Deficiency Syndromes,* 2010. 54(5): p. 542 – 547 10.1097/QAI.0b013e3181e19a6b.

[15] International AIDS Alliance, Behavioural monitoring and HIV infection prevalence among female sex workers as a component of second generation surveillance. 2009, International AIDS Alliance: Kiev.

[16] Uuskula, A., et al., A study on HIV and hepatitis C virus among commercial sex workers in Tallinn. *Sexually Transmitted Infections,* 2008. 84(3): p. 189 – 191.

[17] Platt, L., et al., Effects of sex work on the prevalence of syphilis among injection drug users in 3 Russian cities. *American Journal of Public Health,* 2007. 97(3): p. 478 – 485.

[18] Rhodes, T., et al., Prevalence of HIV, hepatitis C and syphilis among injecting drug users in Russia: Multi-city study. *Addiction,* 2006. 101(2): p. 252 – 266.

[19] Dershem, L., et al., Characteristics, high-risk behaviors and knowledge of STI / HIV / *AIDS,* and STI / HIV prevalence of facility-based female sex workers in Batumi, Georgia: 2004 – 2006. Report on two behavioral surveillance surveys with a biomarker component for the SHIP Project. USAID Cooperative Agreement No. 114 – A-00 – 02 – 00095 – 00. 2007: (Tbilisi), Georgia, *Save the Children,* 2007 Sep. [59].

[20] Stvilia, K., et al., Prevalence of Hepatitis C, HIV, and Risk Behaviors for Blood-Borne Infections: A Population-Based Survey of the Adult Population of T'bilisi, Republic of Georgia. *Journal of Urban Health,* 2006. 83(2): p. 289 – 298.

[21] Busza, J.R., et al., Street-based adolescents at high risk of HIV in Ukraine. *Journal of Epidemiology and Community Health,* 2010.

[22] Cusick, L., A. Martin, and T. May, Vulnerability and involvement and in drug use and sex work. 2003, Home Office: London.

[23] Kral, A.H., et al., Sexual transmission of HIV-1 among injection drug users in San Francisco, USA: risk-factor analysis. *The Lancet,* 2001. 357: p. 1397 – 1401.

[24] Wood, E., et al., Elevated rates of antiretroviral treatment discontinuation among HIV-infected injection drug users: implications for drug policy and public health. *International Journal of Drug Policy,* 2004. 15: p. 133 – 138.

[25] Baral, S., et al., Male sex workers in Moscow, Russia: a pilot study of demographics, substance use patterns, and prevalence of HIV-1 and sexually transmitted infections. *AIDS Care,* 2010. 22(1): p. 112 – 118.

[26] Belza, M.J., Risk of HIV infection among male sex workers in Spain. *Sexually Transmitted Infections,* 2005. 81(1): p. 85 – 88.

[27] Bruckova, M., et al., HIV infection among commercial sex workers and injecting drug users in the Czech Republic. *American Journal of Tropical Medicine and Hygiene,* 2006. 75(5): p. 1017 – 1020.

[28] Leuridan, E., et al., Male sex workers in Antwerp, Belgium: A descriptive study. *International Journal of STD and AIDS,* 2005. 16(11): p. 744 – 748.

[29] Sethi, G., et al., HIV, *sexually transmitted infections,* and risk behaviours in male sex workers in London over a 10 year period. *Sexually Transmitted Infections,* 2006. 82(5): p. 359 – 363.

[30] Strathdee, S.A. and S.G. Sherman, The role of sexual transmission of HIV infection among injection and non-injection drug users. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2003(80 (Supplement 3)): p. S7 – S14.

[31] Ryan, K.A., et al., Characteristics associated with prevalent HIV infection among a cohort of sex workers in Cameroon. *Sexually Transmitted Infections,* 1998. 74(2): p. 131 – 5.

[32] van den Hoek, A., et al., High prevalence of syphilis and other sexually transmitted diseases among sex workers in China: potential for fast spread of HIV. *AIDS,* 2001. 15(6): p. 753 – 9.

[33] van Veen, M.G., et al., HIV and Sexual Risk Behavior among Commercial Sex Workers in the Netherlands. *Archives of Sexual Behavior,* 2010. 39(3): p. 714 – 723.

[34] Aral, S.O., et al., Commercial sex work, drug use, and sexually transmitted infections in St. Petersburg, Russia. *Social Science & Medicine,* 2005. 60(10): p. 2181 – 2190.

[35] Sokolowski, S., Steffan, E., Schnitzer, S., Oremus, D., Brehm, G., Knowledge, Attitudes and sexual Behaviour with regards to HIV/STIs among MSM in 4 EU countries. 2007, Bordernet.EU.

[36] Adam, P.C.G., I. Teva, and J.B.F. de Wit, Balancing risk and pleasure: sexual self-control as a moderator of the influence of sexual desires on sexual risk-taking in men who have sex with men. *Sexually Transmitted Infections,* 2008. 84(6): p. 463 – 467.

[37] Hurtado Navarro, I., et al., Differences between women and men in serial HIV prevalence and incidence trends. *European Journal of Epidemiology,* 2008. 23(6): p. 435 – 440.

[38] Schwappach, D.L.B. and P. Bruggmann, An integrated model of care to counter high incidence of HIV and sexually transmitted diseases in men who have sex with men—initial analysis of service utilizers in Zurich. *BMJ, Public Health*, 2008. 8.

[39] Prasad, L.R., et al., Changing epidemiology of HIV anonymous testing in Switzerland for 1996 – 2006. *Swiss Medical Weekly,* 2009. 139(17 – 18): p. 256 – 63.

[40] Folch, C., Casabona, J., Majó, X., Brugal, T., Meroño, M., González, V., Working group REDAN, Prevalence of HIV , HCV and other sexually transmitted infections and associated risk behaviours among Spanish and immigrant IDU in Catalonia, Spain, in International Harm Reduction Conference. 2010: Liverpool.

[41] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe. *Sexually Transmitted Infections,* 2011.

[42] Platt, L., et al., Systematic Review examining differences in HIV, sexually transmitted infections and health-related risk behaviours between migrant and indigenous sex workers Draft.

[43] Tampep and L. Brussa, Sex Work In Europe: A mapping of the prostitution scene in 25 countries, in Sex Work, Migration and Health, T. International, Editor. 2009, Tampep International: Amsterdam.

[44] European Centre for Disease Prevention and Control (ECDC), Mapping of HIV/STI behavioural surveillance in Europe, in *ECDC Technical Report*. 2009: Stockholm.

[45] Camara, B., et al., Guidelines for Upgrading of HIV/AIDS/STI Surveillance in the Caribbean, in The Third Generation Surveillance of HIV/AIDS/STI Linking HIV, AIDS and STI Case-Reporting Behavioural and Care surveillance, CAREC, WHO, and PANO, Editors. 2002.

[46] Public Health England, Shooting up: infections among injecting drug users in the United Kingdom 2010. An update, November 2011, in *Shooting up: infections among injecting drug users in the United Kingdom*. 2011.

[47] Camoni, L., et al., Continued high prevalence of HIV, HBV and HCV among injecting and noninjecting drug users in Italy. *Annali Dell'Istituto Superiore di Sanita*, 2010. 46(1): p. 59 – 65.

[48] Ongoeva, D., HIV-infection epidemiolgical analysis among sex workers in Central Asia. 2010: Oblast AIDS Centre, Kyrgystan.

[49] Schmidt, A.J., Marcus, U., Mikolaychuk, M., Sekuler, T., Ferrer, L., Folch, C., Hickson, F., Reid, D., Weatherburn, P., Benvenuti, S., Breveglieri, M., Mirandola, M., Hospers, H.J, *EMIS Community Report 1*. 2010.

[50] Mounier-Jack, S., S. Nielsen, and R.J. Coker, HIV testing strategies across European countries. *HIV Medicine,* 2008. 9: p. 13 – 19.

[51] Samet, J.H., Russia and human immunodeficiency virus—beyond crime and punishment. *Addiction,* 2011. 106(11): p. 1883 – 5.

[52] Platt, L., et al., Impact of Gender and Sex Work on Sexual and Injecting Risk Behaviors and Their Association With HIV Positivity Among Injecting Drug Users in an HIV Epidemic in Togliatti City, Russian Federation. *Sexually Transmitted Diseases,* 2005. 32(10): p. 605 – 612.

[53] Miller, C.L., et al., Females experiencing sexual and drug vulnerabilities are at elevated risk for HIV risk infection among youth who use injection drugs. *Journal of Acquired Immune Deficiency Syndromes,* 2002. 30: p. 335 – 341.

[54] Montgomery, S.B., et al., Gender differences in HIV risk behaviours among young injectors and their social network members. *American Journal of Drug and Alcohol Abuse,* 2002. 28(3): p. 453 – 475.

[55] Muga, R., et al., Syphilis in injecting drug users: clues for high-risk sexual behaviour in female IDUs. *International Journal of STD & AIDS,* 1997. 8: p. 225 – 228.

[56] Spittal, P.M. and M.T. Schechter, Injection drug use and despair through the lens of gender. *Canadian Medical Association Journal*, 2001. 164: p. 295 – 305.

[57] Tortu, S., et al., Women's drug injection practices in East Harlem: an event analysis in a high-risk community. *AIDS and Behaviour,* 2003. 7: p. 317 – 328.

[58] Tyndall, M.W., et al., Risky sexual behaviours among injection drugs users with high HIV prevalence: implications for STD control. *Sexually Transmitted Infections,* 2002. 78 (Supplement 1)(S170 – S75).

[59] Vioque, J., et al., Prospective cohort study of female sex workers and the risk of HIV infection in Alicante, Spain (1986 – 96). *Sexually Transmitted Infections,* 1998. 74: p. 284 – 288.

[60] Weber, A.E., et al., HIV Risk Profile and Prostitution Among Female Street Youths. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2002. 79(4): p. 525 – 533.

[61] Booth, R., Dvoryak, S., Anderson, C., John, B., Strathdee, S., Police brutality is independently associated with sharing injection equipment among injection drug users in Odessa, Ukraine, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[62] Sarang, A., et al., Policing Drug Users in Russia: Risk, Fear, and Structural Violence. *Substance Use & Misuse,* 2010. 45(6): p. 813 – 864.

[63] Strathdee, S.A., et al., HIV and risk environment for injecting drug users: the past, present, and future. *The Lancet,* 2010. 376(9737): p. 268 – 284.

[64] Rhodes, T., Sarang, A., Simic, M., Police violence and 'fear-based policy' as barriers to HIV prevention: qualitative case studies in Russia and Serbia, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[65] Rhodes, T., et al., Trust, disruption and responsibility in accounts of injecting equipment sharing and hepatitis C risk. *Health, Risk & Society,* 2008. 10(3): p. 221 – 240.

[66] Rhodes, T., et al., Situational factors influencing drug injecting, risk reduction and syringe exchange in Togliatti City, Russian Federation: a qualitative study of micro risk environment. *Social Science & Medicine,* 2003. 57(1): p. 39 – 54.

[67] Dolan, K., et al., HIV in prison in low-income and middle-income countries. *The Lancet, Infectious Diseases*, 2007. 7(1): p. 32 – 41.

[68] Jürgens, R., A. Ball, and A. Verster, Interventions to reduce HIV transmission related to injecting drug use in prison. *The Lancet, Infectious Diseases*, 2009. 9(1): p. 57 – 66.

[69] Matteelli, A., et al., Chlamydia trachomatis genital infection in migrant female sex workers in Italy. *International Journal of STD & AIDS,* 2003. 14(9): p. 591 – 5.

[70] Strathdee, S., Health risks and power among female sex workers in Moscow, S. report, Editor. 2005.

[71] Ilić, D., S. Šipetić, and V. Bjegović, Risk of HIV infection among indoor and street sex workers and their use of health services in Belgrade, Serbia. Srpski arhiv za celokupno lekarstvo 2010(3 – 4): p. 219 – 224.

[72] Simic, M. and T. Rhodes, Violence, dignity and HIV vulnerability: street sex work in Serbia. *Sociology of Health & Illness,* 2009. 31(1): p. 1 – 16.

[73] Crago, A.L., Arrest the violence. Human Rights abuses against sex workers in Central and Eastern Europe and Central Asia. 2009, Sex Workers' Rights Advocacy Network in Central and Eastern Europe and Central Asia.

[74] Shannon, K., et al., Mapping violence and policing as an environmental-structural barrier to health service and syringe availability among substance-using women in street-level sex work. *International Journal of Drug Policy,* 2008. 19(2): p. 140 – 7.

[75] Boynton, P. and L. Cusick, Sex workers to pay the price. *BMJ,* 2006. 332(7535): p. 190 – 1.

[76] International Harm Reduction Development Program, Women, Harm Reduction, and HIV, in *Assessment in Action*. 2009, Open Society Institute.

[77] Campbell, R. and M. Storr, Challengeing the Kerb Crawler Rehabilitation Programme. Feminist Review, 2001. 67: p. 94 – 108.

[78] Kinnell, H., *Violence and Sex Work in Britain*. 2008, Cullompton: Willan Publishing. 290.

[79] Degenhardt L, M.B., Vickerman P, Rhodes T, Latkin C, Hickman M., Prevention of HIV infection for people who inject drugs: why individual, structural, and combination approaches are needed. *The Lancet,* 2010. 376: p. 285 – 301.

[80] Reuter, P., Ten years after the United Nations General Assembly Special Session (UNGASS): assessing drug problems, policies and reform proposals. *Addiction,* 2009. 104(4): p. 510 – 7.

[81] Degenhardt, L., et al., Toward a global view of alcohol, tobacco, cannabis, and cocaine use: findings from the WHO World Mental Health Surveys. *PLoS Med,* 2008. 5(7): p. e141.

[82] Wood, E., et al., Vienna Declaration: a call for evidence-based drug policies. *The Lancet,* 2010. 376(9738): p. 310 – 2.

[83] Wood, E., et al., The war on drugs: a devastating public-policy disaster. *The Lancet,* 2009. 373(9668): p. 989 – 90.

[84] Room, R., The ambiguity of harm reduction—goal or means, and what constitutes harm?, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor. 2010, Publications Office of the European Union: Luxembourg. p. 108.

[85] Cusick, L., et al., Wild guesses and conflated meanings? Estimating the size of the sex worker population in Britan. *Critical Social Policy*, 2009. 29: p. 703 – 719.

[86] Shannon, K., et al., Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ,* 2009. 339: p. b2939.

[87] Rekart, M.L., Sex-work harm reduction. *The Lancet,* 2005. 366: p. 2123 – 2134.

[88] Goodyear, M.D. and L. Cusick, Protection of sex workers. *BMJ,* 2007. 334(7584): p. 52 – 3.

[89] Cusick, L., Widening the harm reduction agenda: From drug use to sex work. *International Journal of Drug Policy,* 2006. 17(1): p. 3 – 11.

[90] Costenbader, E., Otiashvili, D., Meyer, W., Zule, W., Orr, A., Kirtadze, I., Secrecy and risk among MSM in Tbilisi, Georgia. *AIDS Care,* 2009. 21: p. 591 – 597.

[91] Peryshkina, A., Kizub, D., Deobald, I., Moguilnyi, V., Masenior, N., Wirtz, A., Kostetskaya, I., Sifakis, F., Beyrer, C. Men who have sex with men (MSM), physicians, and non-government organizations (NGOs): finding agreement on the HIV risk environment and service provision for MSM in Russia. in International AIDS Conference 2010. 2010. Vienna.

[92] Rainbow Project, *Through Our Eyes—experiences of Lesbian, Gay and Bisexual people in the Workplace*. 2011.

[93] Csepe, P., et al., HIV risk behaviour among gay and bisexual men in Budapest, Hungary. *International Journal of STD & AIDS,* 2002. 13(3): p. 192 – 200.

[94] Štulhofer, A., et al., HIV-related Sexual Risk Taking Among HIV-negative Men Who Have Sex with Men in Zagreb, Croatia. *AIDS and Behavior,* 2008. 12(3): p. 505 – 512.

[95] Kasianczuk, M.G., et al., Risk Factors Associated with Condom Use Among Men Who Have Sex with Men in Ukraine. *Journal of LGBT Health Research,* 2009. 5(1 – 2): p. 51 – 62.

[96] Reynolds, L., et al., HIV among men who have sex with men in Central and eastern Europe: A review of 30 countries, WHO, Editor. 2011, WHO.

[97] Folch, et al., Factors associated with unprotected sexual intercourse with steady male, casual male, and female partners among men who have sex with men in Barcelona, Spain. Vol. 18. 2006, New York, NY, ETATS-UNIS: Guilford. 16.

[98] Choi, K.H., E.S. Hudes, and W.T. Steward, Social discrimination, concurrent sexual partnerships, and HIV risk among men who have sex with men in Shanghai, China. *AIDS Behavior*, 2008. 12(4 Suppl): p. S71 – 7.

[99] Morris, M. and M. Kretzschmar, Concurrent partnerships and the spread of HIV. *AIDS,* 1997. 11(5): p. 641 – 8.

[100] Kippax, S., et al., Sexual negotiation in the AIDS era: negotiated safety revisited. *AIDS,* 1997. 11(2): p. 191 – 197.

[101] European Men's Internet Survey (EMIS). www.emis-project.eu. (cited).

[102] UNAIDS, An introduction to indicators: UNAIDS monitoring and evaluation fundamentals. 2010.

[103] Mirandola, M., et al., HIV bio-behavioural survey among men who have sex with men in Barcelona, Bratislava, Bucharest, Ljubljana, Prague and Verona, 2008 – 2009. (Special Issue: HIV/AIDS and other sexually transmitted infections (STI) in men who have sex with men (MSM)—trends and behavioural surveillance.). *Eurosurveillance*, 2009. 14(48): p. 19427.

[104] Williamson, L.M., et al., HIV testing trends among gay men in Scotland, United Kingdom (1996–2005): implications for HIV testing policies and prevention. *Sexually Transmitted Infections,* 2009. 85(7): p. 550 – 554.

[105] Granich, R.M., et al., Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: a mathematical model. *The Lancet,* 2009. 373(9657): p. 48 – 57.

[106] Montaner, J.S.G., et al., Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: a population-based study. *The Lancet,* 2010. 376(9740): p. 532 – 539.

[107] Cohen, M., The HIV 'test and treat' movement: the details really matter, and now, in BHIVA Autumn Conference. 2010: London.

[108] Cohen, M.S., HIV Treatment as Prevention: To be or not to be? *Journal of Acquired Immune Deficiency Syndromes,* 2010. 55(2): p. 137 – 138 10.1097/QAI.0b013e3181f0cbf3.

[109] Cohen, M.S., HIV Treatment as Prevention: In the Real World the Details Matter. *Journal of Acquired Immune Deficiency Syndromes,* 2011. 56(3): p. e101 – e102 10.1097/QAI.0b013e3182041968.

[110] Montaner, J.S.G., et al., The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic. *The Lancet,* 2006. 368(9534): p. 531 – 536.

[111] Vanable, P.A., et al., Impact of Combination Therapies on HIV Risk Perceptions and Sexual Risk Among HIV-Positive and HIV-Negative Gay and Bisexual Men. *Health Psychology,* 2000. 19(2): p. 134 – 145.

[112] Jin, F., et al., Unprotected anal intercourse, risk reduction behaviours, and subsequent HIV infection in a cohort of homosexual men. *AIDS,* 2009. 23(2): p. 243 – 252 10.1097/QAD.0b013e32831fb51a.

[113] Boily, M.-C., et al., Heterosexual risk of HIV-1 infection per sexual act: systematic review and meta-analysis of observational studies. *The Lancet, Infectious Diseases*, 2009. 9(2): p. 118 – 129.

[114] Goodreau, S.M., et al., Role versatility among men who have sex with men in urban Peru. *Journal of Sex Research*, 2007. 44(3): p. 233 – 9.

Chapter 1

Introduction

Preface

This report aims to describe the dynamics of HIV epidemics among vulnerable and key populations at high risk in the European region, focusing specifically on people who inject drugs (PWID), sex workers (SWs) and men who have sex with men (MSM). It does so in order to inform future HIV prevention, treatment and care responses as well as to guide future HIV prevention surveillance and research.

A focus on key populations in concentrated HIV epidemics

This report focuses specifically on reviewing European epidemiological evidence in relation to HIV among populations of PWID, SWs and MSM. These populations are "most-at-risk" in concentrated rather than generalised HIV epidemics (see Box 1). As shown in Figure 1.1, the HIV epidemics of Europe are largely 'concentrated' HIV epidemics.

Box 1. Definitions of HIV epidemic

- In generalized epidemics, where HIV is over one percent in the general population, surveillance systems concentrate on monitoring HIV infection and risk behaviour in the general population. This usually includes HIV sentinel surveillance among pregnant women in antenatal care.
- In concentrated epidemics, where HIV is over 5% in any sub-population at higher risk of infection (such as, PWID, SW, & MSM), but under 1% in the general population, surveillance systems should monitor infection in those groups and their behavioural links with the general population. Surveillance systems may also monitor the general population for high-risk sexual behaviours that might lead to rapid spread of the virus if it were introduced, and trends in STIs.
- In low-level epidemics, where relatively little HIV is measured in any group, surveillance systems should focus on key populations at high risk and their associated behaviours looking for changes in behaviour which may increase the transmission of HIV infection.

Sources: UNAIDS/WHO (2000). Guidelines for Second Generation HIV Surveillance: The Next Decade

A focus on exploring evidence in relation to the HIV risk environment

A growing body of research substantiates relationships between environmental factors and HIV vulnerability. [2 – 3] The heuristic of the HIV 'risk environment', for example, has emerged as one way to envisage HIV risk as the product of reciprocal relationships between micro and macro level influences in the physical, social, economic and policy environments which contextualise individual and community actions in relation to risk. [2 – 8] Recent reviews have called for a shift towards social epidemiological approaches capable to capturing how elements of the risk environment affect HIV in vulnerable and key populations. [2, 9] T his requires investigating how the distribution of HIV in such populations is in part shaped by

'social factors'—that is, forces that extend beyond 'proximal' individual-level factors and their biological mediators. Conscious that HIV epidemiological research may often lack sufficient focus on the study of social determinants, this report explores the extent to which recently published European evidence on HIV among key populations of PWID, SWs and MSM captures indicators of the HIV risk environment.

Figure 1.1 The state of HIV epidemics in Europe

Source: See Chapter 3 of this report (for MSM, self–reported as well as those from biologically verified prevalence estimates have been used).

A focus on exploring evidence to generate HIV enabling environments

Recognising HIV epidemics as features of their social and structural contexts emphasises the potentially pivotal role of social and structural interventions in creating environments which are enabling, rather than constraining, of evidence-based HIV prevention. [10 – 12] Key dimensions of 'enabling' policy environments conducive to effective HIV prevention among vulnerable and key populations at high risk include: the meaningful engagement of the main stakeholders and affected populations in policy formation and programming; a coordinated multi-sectoral HIV prevention strategy emphasising an evidence-based public health and rights-oriented approach; the generation of research and surveillance on HIV epidemic spread and response; and the development and scale-up of a package of evidence-based interventions, including the removal of structural obstacles limiting their implementation, such as the criminalisation of affected populations. [11, 13 – 15]. This report considers the implications of the epidemiological evidence it reviews for the development of HIV prevention responses, including those incorporating social and structural intervention approaches.

Outline of the report

In addition to a description of methods (below), the report comprises three main sections. Chapter 2 synthesises evidence drawn from European HIV surveillance data (Chapter 2.1) and targeted HIV prevalence studies (Chapter 2.2). Chapter 3 synthesises evidence drawn from systematic reviews of epidemiological studies among PWID (Chapter 3.1), SWs (Chapter 3.2) and MSM (Chapter 3.3). Chapter 4 draws upon the evidence reviewed in Chapter 3 as well as the international literature more broadly to consider implications for strengthening responses, including in relation to HIV surveillance (Chapter 4.1) and HIV prevention for PWID (Chapter 4.2), SWs (Chapter 4.3) and MSM (Chapter 4.4). In Chapter 5, we draw our conclusions.

1.1 Methods

This report draws upon four main methods of data collection and analysis: a review of HIV surveillance in Europe; a systematic review of published and unpublished epidemiological literature; an ecological analysis exploring the relationship between structural indicators and HIV prevalence; and focusing on PWID specifically, mathematical modelling of the impact of needle and syringe exchange programmes (NSP), opioid substitution treatment (OST) and antiretroviral HIV treatment (ART) on HIV incidence and prevalence.

For the purposes of this report we adopt the World Health Organization's (WHO) definition of Europe. This includes 54 countries in total: 24 from Western Europe (Andorra, Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Liechtenstein[1], Luxembourg, Malta, Monaco, the Netherlands, Norway, Portugal, San Marino, Spain, Sweden, Switzerland and the United Kingdom), 15 from Central Europe (Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Hungary, Kosovo[2], The former Yugoslav Republic of Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Turkey), and 15 from Eastern Europe and Central Asia (Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan, Ukraine and Uzbekistan).

Throughout the report we provide selective illustrative case studies, including the following countries: Ukraine, United Kingdom, Estonia, Portugal, and Russian Federation; and sub-region: the Central Asian Republics. A case study approach enables us to draw upon of unpublished and review material not available to the systematic review and to explore the dynamics of HIV epidemic and vulnerability across key populations.

1.1.1 Review of HIV surveillance data

HIV case reports

We examine public health surveillance data related to HIV in Europe using published information as well as grey literature with the aim to exploring the burden of HIV case reports attributed to injecting drug use, sex between men, and heterosexual exposure with particular focus on trends in the last 5 years (2006 – 2011). These analyses are synthesised in Chapter 2 of this report.

The reporting of HIV diagnosis has been examined using the following data sources:

- HIV/AIDS surveillance data from European Centre for Disease Prevention and Control (ECDC)/WHO Regional Office for Europe (data up to 2010) [16]
- HIV diagnoses reports to the Federal AIDS Centre for the Russian Federation (data up to 2010) [17]
- EuroHIV 2006 survey on HIV and AIDS surveillance in the WHO European Region [18]

Biological and behavioural studies

Alongside HIV case reports we examine the extent and methods of directly assessed HIV prevalence and related risk behaviours from targeted studies among PWID, SW, and MSM. This enables us to assess the extent of 'second-generation' surveillance activities in place. [1]

Sources used to identify biological and behavioural HIV surveillance activities included:

- Results of systematic searches of the published literature (both scientific journal and grey literature) undertaken for each of the three main population groups: MSM, PWID and SW (see below)
- ECDC report on Behavioural Surveillance in EU/EFTA: for data on behavioural surveillance in EU/EFTA on PWID, MSM, and SW [19]
- EuroHIV reports on HIV prevalence studies: for data on HIV Sero-surveillance 2000 – 06 inclusive

1 Lichtenstein data are reported via Switzerland, there are therefore 53 country reports, with Switzerland reporting for two countries.
2 Kosovo became a member of the World Bank Group in 2009. As far as WHO is concerned, references to "Kosovo" shall be understood to be in the context of UN Security Council resolution 1244 (1999).

[20 – 22]

- European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) Drug Related Disease Key Indicator: for data on HIV prevalence studies among PWID in the EU, Norway and EU accession countries [23]

Studies using self-reported HIV results to measure prevalence, surveys with sample sizes less than 50, or studies where the sampled population was unclear or was likely to be unrepresentative of the population concerned were excluded. Our analyses are limited in that they only draw upon published sources in English, Spanish, French, and Russian identified through searches for documents (scientific journal articles and grey literature) published since 2000. The analyses here may under estimate the extent to which surveys to directly measure HIV prevalence or risk behaviours have been undertaken as they exclude publications in other languages, studies that could not be identified through the searches undertaken, and very recent and other unpublished surveys. Our analyses reported in Chapter 3 focuses on 50 countries in the region, excluding the four smallest countries which all have populations less than 100,000 people (Andorra, Lichtenstein, Monaco, San Marino). Such small population numbers are likely to make undertaking targeted surveys among PWID, SWs and MSM impractical.

Assessing the extent and quality of HIV surveillance

We examine the extent of biological and behavioural studies among PWID, SWs and MSM by documenting the activity in each country and the extent of repeated surveys that provide a system of ongoing monitoring. The quality of the studies that was considered during the process of selecting 'best' HIV prevalence estimates (see below). We use the data extracted during this process and selected case studies to explore the range and robustness of the methodologies used.

'Best estimates' of HIV prevalence

In order to better compare prevalence estimates across the region as well as explore the quality of estimates used by country, we selected what we defined as the 'best' national level prevalence estimates. An appendix of all such scored studies is available upon request. Our criteria for selection included: wide geographic coverage; most recent study; population sampled; and recruitment setting. We allocated up to three points for most recent studies, up to three points for the population sampled, up to three points for country coverage, and up to three points for the range of settings sampled. We deducted one point for treatment only samples due to the potential bias associated with recruiting from such settings.

We use these indicators in order to gain some insights into the quality of second-generation surveillance in the country and what further work may be needed (summarised in Chapter 2) as well as to select a 'best estimate' of HIV prevalence among key populations (summarised in Chapter 3).

Taking HIV case reporting systems and biological and behavioural surveillance studies together, we categorise surveillance systems according to whether they are:

- 'Comprehensive' (case reports plus prevalence and behavioural surveillance in two or more geographical sites, clear definition of population group, two or more recruitment methods used, multiple years, as well as estimates of population size)
- 'Extensive' (case reports plus prevalence and/or behavioural surveillance in at least one area, clear definition of population group, clear recruitment methods, not repeated)
- 'Focused' (case reports plus prevalence and/or behavioural surveillance in one site, not repeated);
- 'Basic' (only case reports) or
- 'None'

By drawing on the quality assessment of the range of prevalence estimates identified, national epidemics among each population were classified to allow for easier comparison. Using the "best" quality esti-

mate(s) available to us, the HIV prevalence in PWID, SWs and MSM were classed as: 'Low' (<1%); 'Medium' (1% to <5%); 'High' (5% to<20%); or 'Very High' (20% or more). This definition of the magnitudes of national epidemics were compared alongside HIV case reports and our assessment of the quality of the national surveillance systems in order to assess the appropriateness of the system in place to effectively monitor HIV in that population. This analysis of quality assessment and improvement is presented in Chapter 4.

Estimates of PWID and SW population sizes

Data on the number of PWID aged 15 – 64 in a country were obtained from national estimates as reported by the EMCDDA, Reference Group to the United Nations on HIV and injecting drug use [24] or by Country Coordination Mechanisms (CCMs) in their most recent grant proposals to the Global Fund. [24] The prevalence of PWID in a country was obtained by dividing the PWID population by the total population aged 15 – 64 and expressed as a rate per 1,000 individuals.

Missing values were imputed based on other available data or by using estimates from neighbouring countries with similar epidemiological profiles. Where a range of values were available, the mid-point value was taken or more complex estimations were sought to arrive at acceptable estimates. For example, the estimated size of the PWID population in Latvia was unavailable, although the population of problem drug use (PDU, which includes PWID and long term use of opioids, cocaine or amphetamines according to the EMCDDA) was estimated at 7,191, or 4.6 per 1,000 adult population. In neighbouring Lithuania whose PWID epidemic has similar features, the PWID population is estimated at 2.2 per 1,000 adult population. Extrapolating this figure to the Latvian adult population we assumed that the size of the PWID population in Latvia would be about 3,429, a figure around half the size of the PDU population, which seemed a plausible estimate. Where data on main drug injected were unavailable, data from the EMCDDA on treatment demand that indicates the proportion of patients entering treatment, stratified by primary drug and proportion injecting was used to obtain a country level estimate. This estimate assumes that treatment demand is relatively equal across groups of drug users across the country.

Data on the number of female SWs (FSWs) in a country were obtained from estimates of the proportion of FSWS in the adult population provided by Vandepitte et al, (n=41). [25] Actual numbers were calculated using these estimates, multiplied by the female adult population (aged 15 – 64) then divided by 1000 to give a rate per 1000 population. Other estimates were derived from project reports collated by the European Network for HIV/STI Prevention and Health Promotion among Migrant Sex Workers (TAMPEP) and projects funded by the Global Fund. Where estimates varied widely across the three sources a mid point was taken and a low- and high-range are presented. Data on the profile of FSWs were taken from the systematically reviewed literature (see below). Missing data on levels of injecting or violence among FSW populations were imputed using the same methods applied to missing PWID indicators.

1.1.2 Systematic review of epidemiological literature

We conducted a systematic review to assess published and unpublished epidemiological and behavioural research data (both quantitative and qualitative studies) addressing vulnerable and key populations at high risk, HIV and risk behaviours to examine the prevalence and incidence of HIV among PWID, SWs and MSM, and to establish what factors (from behavioural to structural) are driving the HIV epidemic among key populations in Europe.

The specific research questions to be answered through the review exercise were:

- What is the prevalence and incidence of HIV among key populations (PWID, SWs, MSMs, prisoners and migrants) in Europe?
- What are the individual, social and environmental risk factors associated with HIV and HIV risk factors among these populations?

- How does risk differ within sub-populations of each population?

Searches and inclusion criteria

The following databases were searched: MEDLINE (1950 – 2008), EMBASE, Social Science Citation Index, Popline, CINAHL, Global Health, and using a search combining terms for injecting drug users, sex work, men who have sex with men, HIV and risk factors for acquiring HIV drawing on thesaurus and non-thesaurus as appropriate (a summary of our full search terms is attached in Appendix 1.A.1). Reference lists of found articles were also searched and experts in the field consulted to identify other relevant studies. We conducted a systematic search of websites of research institutes, service providers and donor organisations working with the risk groups across the region. Conference abstracts from the International Conference on the Reduction of Drug Related Harm was searched (2005 – 10) and the International AIDS Conference (2006, 2008. 2010). A list of the websites search is attached in Appendix 1.A.1.

Quantitative studies

We included reports written in English, Spanish, French and Russian published from 2005 – 2011 based on studies undertaken in WHO-defined Europe that reported rates among PWID, SWs (male, female or transgender selling sex to men or women) and MSM on any of the following: HIV prevalence or incidence; sharing needles/syringes; unprotected anal intercourse; and unprotected vaginal intercourse. PWID were defined as someone who has ever injected drugs for non medical purposes. A SW was defined as someone who has ever exchanged sex for money, drugs or goods. MSM is defined as a chromosomal male who has ever had penetrative sex with another chromosomal male (i.e. it includes male-to-female transgender people and heterosexually identified men). Studies were included if they reported crude or adjusted associations.

For SWs, we broadened search terms to include composite measures of HIV and STIs and risk associated with acute STIs. [26 – 27] We examined composite measures of HIV and STIs in order to assess vulnerability associated with infection rather than as biologically plausible risk factors. We also included studies published between up to 2000 where there were no recent estimates available.

Qualitative studies

We draw selectively (rather than systematically) upon qualitative studies where their aims were to explore the lived experiences of risk among PWID, SW and MSM and harms associated with increased risk of HIV.

Exclusion criteria

Manuscripts that were commentaries or editorials were excluded as were review papers containing no primary data, although these were gathered in order to gather references for primary studies not identified by the search. Papers not fitting the inclusion criteria were coded according to whether they contained information on HIV interventions or coverage or interventions. These papers were set aside to aid interpretation of the systematic review findings.

Results of search and data extraction

From the included quantitative studies, we extracted data from all studies on: setting (specifying city/region and country); date (of publication and/or fieldwork); study aim, design, sampling strategy, sample size, data-collection methods and analytic strategy; population and definition used); measures of HIV prevalence and incidence; receipt of HIV testing; and author-reported study limitations. Demographic characteristics, risk behaviours and experience of other harms extracted varied according to individual risk groups. Information on the numbers of papers identified and the process of the systematic review are included in Appendix 1.A.2, Figures 1 – 3. For the qualitative studies we extracted data on the main themes, concepts and findings on the social contextual factors linked to risk practices and HIV vulnerability.

A total of 5644 studies were identified in the systematic review of PWID. Among these, 128 were used to generate estimates of HIV/STI prevalence and demographic and risk profile of PWID. We extracted data

on: duration of injecting career, main drug injected, regular income, the proportion HIV tested, needle/syringe sharing, inconsistent condom use, sex work, arrests, prison and history of drug treatment, and sample characteristics (gender, age, sampling methodology, drug user inclusion criteria).

A total of 1993 studies were identified in the systematic review of sex workers. Among these, 73 papers were used to generate estimates of HIV/STI prevalence and demographic and risk profile of SWs. We extracted data on: unprotected vaginal intercourse, unprotected anal intercourse with clients and non-paying partners, experience of violence from clients or police, injecting drug use, time in sex work, location of sex work; and sample characteristics (age, nationality, education). In addition we extracted data from qualitative papers to interpret findings from the systematic review, particularly in relation to experience of violence and mental health that weren't well documented in the epidemiological data.

A total of 3,200 papers were identified, and among these, 73 papers were used to generate estimates of HIV prevalence and demographic and risk profile of MSMs. We extracted data on unprotected anal intercourse, female partners, unprotected vaginal intercourse, experience of violence, alcohol and drug use including injecting drug use, selling, buying and trading sex; and sample characteristics (age, nationality, education, socio-economic position).

1.1.3 Ecological analysis

We collected selected indicators of structural interventions and social-structural factors across the region. The primary method used for collating up-to-date indicators was to synthesise routine coverage estimates produced by international agencies, governmental and non-governmental organisations (NGO) and umbrella organisations working in Europe. Indicators were collated from: the World Health Organization Regional Office for Europe; the ECDC' EMCDDA; Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM; International AIDS Alliance; the International Harm Reduction Association (IHRA); the United Nations Reference Group on HIV Prevention Among IDUs; International Gay and Lesbian Association; UNAIDS Stigma index; national censes; the Global Network of People living with HIV; and the European Network for HIV/STI Prevention and Health Promotion among Migrant Sex Workers (TAMPEP).

Coverage and policy indicators

Data on intervention coverage including numbers of services and PWID accessing those services for NSP and OST were obtained from the EMCDDA and the UN Reference Group [28]. Data on PWID accessing ART was obtained from WHO Europe. The majority of variables are not complete for all countries. The presence and quantity of NSP, OST and ART sites in a country as well as the estimated number of people accessing them were obtained from the EMCDDA and the UN Reference Group [28] for the most recent year available.

Data on different legislative models regulating sex work and services working with sex workers in the region were collated from our systematic review as well as: Global Fund Project Monitoring Reports; a directory of health and social support services for sex workers in Europe(services4sexworkers.org); surveys produced by the International AIDS Alliance; and the European Network for HIV/STI Prevention and Health Promotion among Migrant Sex Workers (TAMPEP). [29 – 32]

Data on the extent of HIV testing among MSM were extracted from the systematic review and the European Men's Internet Survey. [33] We extracted data on the coverage achieved of MSM by HIV programmes through UNGASS indicators collected through the Dublin Declaration. [34]

Outcome

The primary outcomes of HIV prevalence among PWID, FSWs and MSMs were drawn from our systematic review of recent published and grey literature. Best estimates of HIV prevalence and injecting drug use (for FSWs only) were selected according to the criteria described to assess the quality and extent of biological and behavioural surveillance. In the case of multiple studies with equal scores, a weighted average of HIV and injecting drug use was taken. For FSWs this applies to the Russian Federation,

Ukraine, Georgia, Spain and The former Yugoslav Republic of Macedonia . The relationship between HIV prevalence and selected structural indicators are described using linear regression models. Findings from this analysis are used to illustrate key points in Chapter 4.

Policy environment index for PWID

We generated a simple index of 'enabling' policy environment. Our interpretation of an enabling policy environment drew upon guidelines generated by WHO, [35] UNAIDS, [36] international non-government organisations (NGOs), [37] and peer-reviewed papers in this field.[9, 12, 14, 38] As outlined in Appendix 1.A.3, the core items of the index included indicators, at the country level, of: coordinated national strategy to HIV prevention and drug use (indicated by evidence of explicit inclusion of 'harm reduction' in national-level strategy, and monitoring and evaluating HIV epidemics); meaningful engagement of stakeholders in HIV prevention policy formation and programming (indicated by evidence of a national organisation of drug users); and evidence-based HIV prevention intervention approaches (indicated by presence of OST and NSP, presence of OST and NSP in prison settings, and evidence of de-emphasising criminalisation through the use of administrative penalties for drug use possession for personal use).

Indicator data were obtained from a combination of sources, including: global reports of harm reduction policy and coverage; [39] country profiles collated and updated by the EMCDDA; [40] our systematic review of research studies; and the International Network of People who Use Drugs. [41] The index was constructed by allocating equal weight to each of the six items and aggregating a score for each country, with higher scores indicating a more 'enabling' environment conducive to evidence-based public health approaches.

Key indicators of supportive policy environment for MSM were selected as follows:

- Legislation against male-male sex
- Whether the legislation pre-dates 1981
- Legislation against discrimination on the grounds of sexual orientation
- The presence of an annual Gay Pride activity
- The recognition of civil partnership or marriage between people of the same gender

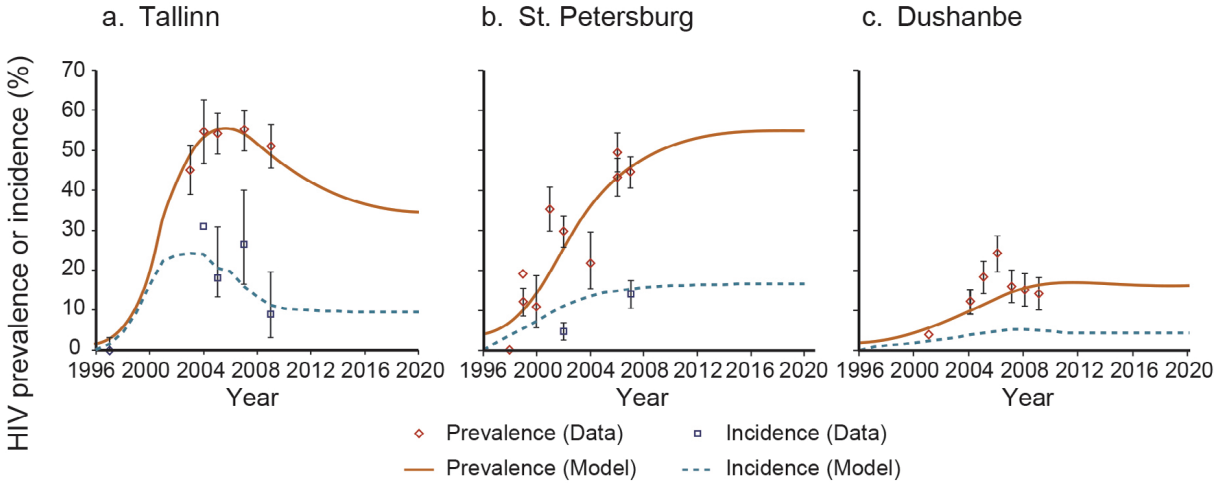
The index was constructed by allocating equal weight to each of the items and aggregating a score for each country, higher scores indicating a more liberal legislative and social environment. The findings of the policy index are presented in Chapter 4.

1.1.4 Modelling analysis

We conducted a simple modelling analysis to consider the potential impact on HIV incidence and prevalence of OST, NSP and ART in three illustrative epidemic scenarios: Russian Federation (St Petersburg); Estonia (Tallinn) and Tajikistan (Dushanbe). At baseline, the model is calibrated to detailed HIV prevalence and incidence data from each setting, adjusting for the possible decrease in HIV incidence resulting from heightened coverage of NSP in Tallinn [42] or moderate coverage NSP in Dushanbe. The model also adjusts for possible longer duration of injecting in Tallinn and St. Petersburg than Dushanbe. [43 – 45] In accordance with NSP data from Tallinn, [42] the effect of NSP in Tallinn was assumed to scale up from 2003 to 2009 with the final efficacy estimated from fitting the model to observed prevalence and incidence trends in Tallinn, while assuming the efficacy in intermediate years is proportionate to the relative number of syringes distributed in that year compared to 2009. The same assumptions for the effect of NSP on HIV transmission were assumed for Dushanbe but with syringe distribution scaling up more slowly from nothing in 1999 to about 7 syringes per PWID per year in 2006, and then rapidly up to about 32 syringes per PWID per year by 2010 and 2011. The model was fit to HIV prevalence and incidence data by adjusting the HIV seeding prevalence in 1996 (to shift when the epidemic starts), the infection rate per month in latent phase of HIV and duration of injecting (both used to change the rate at which the epidemic progresses and the prevalence it stabilizes at). The effect of NSP expansion in Tallinn was used to fit the model to the downturn in HIV incidence (and possibly prevalence) in Tallinn. The adjusted

parameter values used for the model fits are in Appendix Table 1.A.4, while all other parameters were kept constant and are shown in Appendix 1.A.5. A comparison of the model (Baseline projections) with prevalence and incidence data from each setting is shown in Figure 1.2 Comparison of HIV prevalence and incidence projections in three sites. It is important to note that the model runs should only be seen as illustrative for the type of epidemic occurring in these different settings, ie. the Tallinn epidemic represents a high prevalence epidemic with high coverage NSP whereas the St. Petersburg and Dushanbe epidemics represent high and moderate HIV prevalence epidemics, respectively, with no or moderate NSP.

Figure 1.2 Comparison of HIV prevalence and incidence projections in three sites in Eastern Europe (1996 – 2020)



Source: Authors

Assumptions underlying the modelling of the impact of scaling up OST, NSP and ART are summarised as follows:

- Receipt of OST reduces the chances of a PWID becoming infected by 50% based on a recent unpublished meta-analysis of cohort studies that estimates the reduction in HIV incidence among people currently on OST. [46] Any scale up of OST and NSP is assumed to occur over 7 years from 2012 to mimic the scale up of NSP in Tallinn, [42] and the impact of different final coverage levels are considered
- High coverage NSP (assumed to correspond to 70 syringes distributed per PWID per year as achieved in Tallinn in 2008/09) is assumed to reduce the chances of a PWID becoming infected by 40%, based on the possible effect of widespread NSP on HIV incidence in Tallinn [42] as calibrated through fitting the model to observed trends in HIV incidence in that setting. This effect is assumed to occur at the highest NSP coverage achieved in Tallinn in 2008/2009 (~70 syringes distributed per PWID per year), whereas for lower coverage levels a linear relationship is assumed between syringe distribution per PWID per year and the relative decrease in transmission risk. This is likely to be a simple approximation of the likely real relationship between level of syringe distribution and resulting decrease in HIV incidence, but unfortunately no suitable data exists to parameterize the model more precisely. Therefore, any coverage of NSP is assumed to be relative to the maximum coverage of NSP achieved in Tallinn, with 100% coverage assumed to have the same efficacy as achieved in Tallinn in 2008/09 (40% reduction in infection risk to all PWID) and 50% coverage assumed to have half this efficacy, i.e. 20% reduction in HIV infection risk amongst all PWID or 50% of PWID have a 40% reduction in risk
- Receipt of ART reduces the infectivity of a HIV+ PWID by 80%. This is based on results of recent trials [47 – 48] adjusted downwards for the lower adherence levels achieved among PWID [49 – 51] than in these trials, which has been shown to increase viral load [52 – 55]. For simplicity, it is assumed that all HIV+ PWID (except those in the initial acute phase) can be recruited on to ART at a fixed rate. ART coverage is only measured among HIV+ PWID

Note, the NSP and OST HIV effect estimates roughly coincide with the published effect of OST or high coverage NSP in decreasing HCV incidence amongst PWID in United Kingdom. [56] For each intervention, we consider the coverage needed of each intervention separately or in combination to: (1) Achieve a 30% or 50% relative reduction in HIV incidence or prevalence over 10 years; and (2) Reduce HIV incidence to below 1% or HIV prevalence below 10% after 20 years.

Model equations

The model stratifies the PWID population into those that are susceptible to HIV infection (stage x) and those that are HIV infected. The HIV infected can either be in the initial high viraemia phase of infection (stage h with average duration 1/ν), longer latent stage of low viraemia (stage y with average duration 1/γ), a short late phase of high viraemia pre-AIDS (stage a with average duration 1/η), or on ART (stage τ with average duration 1/Δ) . PWIDs enter the population at a rate Ω(t) that is set to balance all PWIDs leaving the population due to non-HIV causes (at a rate μ—includes cessation and overdose) and HIV mortality/morbidity (at a rate η) if there was no ART. PWID can be recruited onto ART (at a rate r) once they enter the long latent phase of HIV, upon which they have reduced infectivity (cofactor ω). Those in the initial and late phases of high viraemia have heightened transmission (cofactors δ and θ respectively) compared to the infection rate of those in the latent phase of HIV (β). OST and NSP are assumed to have specific coverage levels (n(t) and o(t)—independent of each other but varying over time) and reduce HIV transmission by cofactors ψo and ψn, respectively, when not in combination, and by ψon if in combination. OST and NSP are not modelled explicitly because PWIDs move between these groups with quite fast turnover and so incorporating them as average coverage levels is a reasonable approximation. The model equations are included below:

$$\frac{dx}{dt} = \Omega(t) - \frac{\beta x}{N}\Phi(t)\left(h\delta + y + \theta a + \omega\tau\right) - \mu x$$

$$\frac{dh}{dt} = \frac{\beta x}{N}\Phi(t)\left(h\delta + y + \theta a + \omega\tau\right) - h\left(\nu + \mu\right)$$

$$\frac{dy}{dt} = \nu h - y\left(\mu + \gamma + r\right)$$

$$\frac{da}{dt} = \gamma y - a\left(\mu + \eta + r\right)$$

$$\frac{d\tau}{dt} = r\left(a + y\right) - \tau\left(\mu + \Delta\right)$$

Where N is the total PWID population size (n=x+h+y+a+τ), Φ(t) is the overall cofactor effect of NSP and OST and has the following form (where the coverage of OST and NSP, o and n, vary over time):

$$\Phi(t) = \left(1 - o - n + on\right) + o\left(1 - n\right)\psi_o + n\left(1 - o\right)\psi_n + on\psi_{on}$$

And the inflow into the PWID population (Ω(t)) is defined as below where a' is the number that would be in the aids state if no ART were present:

$$\Omega(t) = \mu N + \eta a'$$

Limitations

The modelling described here is relatively simple, and so the projections should be seen as indicative of the impact that could be expected from scaling up interventions in settings with different HIV prevalences. Firstly, the model only incorporates heterogeneity with respect to stages of HIV and ART status and so the effect of risk heterogeneity in relation to injecting is not accounted for. It is likely that risk heterogeneity would reduce the projected impact of these interventions, but may be a lesser concern if PWID transition between different categories of risk. [57] Secondly, only single model fits were obtained for each setting—allowing for multiple model fits would quantify the degree of uncertainty that is present in our

impact projections. [58] However, because the model is fit to multiple estimates for the HIV prevalence and incidence for each setting, the level of uncertainty due to not obtaining multiple model fits should be reduced. Thirdly, minimal risk behaviour data from each setting was used in the model fitting. This was because normal measures of syringe and equipment sharing are generally biased and so are unreliable for parameterising models. Instead, the HIV prevalence and incidence data from each setting was used to calibrate the modelled HIV epidemic by adjusting the average monthly risk of HIV transmission between any susceptible and infected PWID, the time at which the epidemic started and the estimated leaving rate for HIV uninfected PWIDs.

The current duration of injecting reported in each setting was used to evaluate the likely difference in each settings leaving rate. The model fits to the HIV prevalence and incidence data suggest that the model can portray the type of epidemic that occurred in each setting. Lastly, we do not consider uncertainty in the efficacy estimates for the different interventions. This is of most concern for ART and NSP because there is little evidence assessing the impact of ART on parenteral HIV transmission, and it is hard to assess the efficacy of specific levels of syringe distribution on an individual's risk of acquiring HIV. Despite this issue, the efficacy estimate for NSP seems reasonable because it coincides with the possible HIV-impact of wide-spread NSP in Tallinn [42] and the impact of high coverage NSP on other blood borne infections. [56] It also seems reasonable that ART will have a large impact on parenteral HIV transmission, as evidence shows a huge decrease in plasma viral load when individuals start treatment and ecological studies have shown associations between PWID community viral load and HIV incidence at the population level in Vancouver and Baltimore. [59] Due to the uncertainty in the exact effect of ART on HIV transmission in PWID, and because of the low adherence observed among PWIDs, [49] we used a conservative estimate of 80% for the efficacy of ART in reducing HIV transmission risk amongst PWID.

References

[1] UNAIDS/WHO. Guidelines for Second Generation HIV Surveillance: The Next Decade. In. Geneva, Switzerland; 2000:48.

[2] Poundstone K. E., et al. The Social Epidemiology of Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome. *Epidemiologic Reviews* 2004,26:25 – 35.

[3] Sumartojo E. Structural factors in HIV prevention: concepts, examples, and implications for research. *AIDS* 2000,14 Suppl 1:S3 – 10.

[4] Cusick L. Widening the harm reduction agenda: From drug use to sex work. *International Journal of Drug Policy,* 2006,17:3 – 11.

[5] Rhodes T. The 'risk environment': a framework for understanding and reducing drug-related harm. *International Journal of Drug Policy* 2002,13:85 – 94.

[6] Rhodes T., et al., The social structural production of HIV risk among injecting drug users. *Social Science & Medicine,* 2005, 61:1026 – 1044.

[7] Latkin C. A., et al., The relationship between social network characteristics and exchanging sex for drugs or money among drug users in Baltimore, MD, USA. *International Journal of STD & AIDS,* 2003,14:770 – 775.

[8] Latkin C, et al. Personal network characteristics as antecedents to needle-sharing and shooting gallery attendance. Social Networks 1995,17:219 – 228.

[9] Strathdee SA, et al., HIV and risk environment for injecting drug users: the past, present, and future. *The Lancet,* 2010,376:268 – 284.

[10] Gupta GR, et al. Structural approaches to HIV prevention. *The Lancet,* 2008,372:764 – 775.

[11] Blankenship K, et al. Structural Interventions: Concepts, Challenges and Opportunities for Research. *Journal of Urban Health,* 2006,83:59 – 72.

[12] Rhodes T, et al. Transition and the HIV risk environment. *BMJ,* 2005,331:220 – 223.

[13] World Health Organisation (WHO). Policy and Programming Guide for HIV/AIDS Prevention and Care among Injecting Drug Users. In; 2005.

[14] Degenhardt L MB, Vickerman P, Rhodes T, Latkin C, Hickman M. Prevention of HIV infection for people who inject drugs: why individual, structural, and combination approaches are needed. *The Lancet,* 2010,376:285 – 301.

[15] Beyrer C, et al. The Global HIV Epidemics among men who have sex with men. In: World Bank; 2011.

[16] European Centre for Disease Prevention and Control/WHO Regional Office for Europe. HIV/AIDS surveillance in Europe 2010. In. Stockholm: European Centre for Disease Prevention and Control; 2011.

[17] Department of Health and Social Development of Russian Federation, et al. *HIV INFECTION Newsletter № 35*. In. Moscow 2011.

[18] EuroHIV. Report on the EuroHIV 2006 survey on HIV and AIDS surveillance in the WHO European Region. In. Saint-Maurice: Institut de veille sanitaire; 2007.

[19] European Centre for Disease Prevention and Control (ECDC). Mapping of HIV/STI behavioural surveillance in Europe. In: *ECDC TECHNICAL REPORT*. Stockholm; 2009.

[20] EuroHIV. HIV/AIDS Surveillance in Europe. *Mid-year report, 2005*. In. Saint-Maurice: Institut de veille sanitaire; 2006.

[21] EuroHIV. HIV/AIDS Surveillance in Europe. *Mid-year report 2006*. In: HIV/AIDS Surveillance in Europe. Edited by EuroHIV. Saint-Maurice: French Institute for Public Health Surveillance; 2007.

[22] EuroHIV. HIV/AIDS Surveillance in Europe. *Mid-year report 2007*. In: Saint-Maurice: Institut de Veille Sanitaire; 2007.

[23] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). www.emcdda.europa.eu/themes/key-indicators/drid. In.

[24] Mathers BM, et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *The Lancet,* 2008,372:1733 – 1745.

[25] Vandepitte J, et al. Estimates of the number of female sex workers in different regions of the world. *Sexually Transmitted Infections,* 2006,82:III18 – III25.

[26] Folch C, et al. Prevalence of human immunodeficiency virus, Chlamydia trachomatis, and Neisseria gonorrhoeae and risk factors for sexually transmitted infections among immigrant female sex workers in Catalonia, Spain. *Sexually Transmitted Diseases,* 2008,35:178 – 183.

[27] Linhart Y, et al. Sexually transmitted infections among brothel-based sex workers in Tel-Aviv area, Israel: high prevalence of pharyngeal gonorrhoea. *International Journal of STD & AIDS* 2008,19:656 – 659.

[28] Mathers BM DL, Ali H, Wiessing L, Hickman M, Mattick RP, Myers B, Ambekar A, Strathdee SA. HIV prevention, treatment, and care services for people who inject drugs: a systematic review of global, regional, and national coverage. *The Lancet,* 2010,375:1014 – 1028.

[29] Central and Eastern European Harm Reduction Network. Sex work, HIV/AIDS, and human rights in Central and Eastern Europe and Central Asia. A report from the Central and Eastern European Harm Reduction Network: Vilnius, Lithuania, CEEHRN, July, 2005.

[30] Crago AL. Arrest the violence. Human Rights abuses against sex workers in Central and Eastern Europe and Central Asia. In: Sex Workers' Rights Advocacy Network in Central and Eastern Europe and Central Asia; 2009.

[31] Cwikel JG, et al. Sexually transmissible infections among illegal female sex workers in Israel. *Sexual Health,* 2006,3:301 – 303.

[32] Gjenero-Margan I, Kolari, B. Epidemiology of HIV Infection and AIDS in Croatia – An Overview. *Collegium Antropologicum* 2006:11 – 16.

[33] Schmidt AJ, Marcus, U., Mikolaychuk, M., Sekuler, T., Ferrer, L., Folch, C., Hickson, F., Reid, D., Weatherburn, P., Benvenuti, S., Breveglieri, M., Mirandola, M., Hospers, H.J,. EMIS Community Report 1. In; 2010.

[34] European Centre for Disease Prevention and Control. Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report. In. Stockholm: ECDC; 2010.

[35] World Health Organisation (WHO). Adelaide Recommendations on Healthy Public Policy. In. Geneva: World Health Organization; 1988.

[36] Reference Group to the United Nations on HIV and Injecting Drug Use. Consensus Statement of the Reference Group to the United Nations on HIV and Injecting Drug Use 2010. In; 2010.

[37] International HIV/AIDS Alliance (Secretariat). Enabling Legal Environments for Effective HIV Responses. In; 2010.

[38] Tawil O, et al. Enabling approaches for HIV/AIDS prevention: can we modify the environment and minimize the risk? *AIDS* 1995,9:1299 – 1306.

[39] International Harm Reduction Association. The Global State of Harm Reduction 2010: Key issues for broadening the response. In. Edited by Cook C; 2010.

[40] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Country Overviews. In; 2011.

[41] Albert ER, International Network of People who Use Drugs (INPUD),. Personal communication with Emma Jolley. In; 2011.

[42] Uuskula A, et al. Expanded syringe exchange programs and reduced HIV infection among new injection drug users in Tallinn, Estonia. *BMC Public Health,* 2011,11:517.

[43] Beyrer C, et al. Characterization of the emerging HIV type 1 and HCV epidemics among injecting drug users in Dushanbe, Tajikistan. *AIDS Research and Human Retroviruses* 2009,25:853 – 860.

[44] Niccolai LM, et al. High HIV Prevalence, Suboptimal HIV Testing, and Low Knowledge of HIV-Positive Serostatus Among Injection Drug Users in St. Petersburg, Russia. *AIDS and Behavior,* 2010,14:932 – 941.

[45] Platt L, et al. High HIV prevalence among injecting drug users in Estonia: implications for understanding the risk environment. *AIDS,* 2006,20:2120 – 2123.

[46] MacArthur GJ, et al. Evidence for the effectiveness of opiate substitution treatment in relation to HIV transmission in people who inject drugs: a systematic review and meta-analysis. In preparation 2012.

[47] Cohen MS, et al. Prevention of HIV-1 infection with early antiretroviral therapy. *New England Journal of Medicine,* 2011,365:493 – 505.

[48] Donnell D, et al. Heterosexual HIV-1 transmission after initiation of antiretroviral therapy: a prospective cohort analysis. *The Lancet,* 2010,375:2092 – 2098.

[49] Malta M, et al. Adherence to antiretroviral therapy among HIV-infected drug users: a meta-analysis. *AIDS Behavior,* 2010,14:731 – 747.

[50] Wood E, et al. Adherence and plasma HIV RNA responses to highly active antiretroviral therapy among HIV-1 infected injection drug users. *Canadian Medical Association Journal* 2003,169:656 – 661.

[51] Nolan S, et al. Adherence and plasma HIV RNA response to antiretroviral therapy among HIV-seropositive injection drug users in a Canadian setting. *AIDS Care,* 2011,23:980 – 987.

[52] Bangsberg DR, et al. Adherence to protease inhibitors, HIV-1 viral load, and development of drug resistance in an indigent population. *AIDS,* 2000,14:357 – 366.

[53] Petersen ML, et al. Pillbox organizers are associated with improved adherence to HIV antiretroviral therapy and viral suppression: a marginal structural model analysis. *Clinical Infectious Diseases* 2007,45:908 – 915.

[54] Gross R, et al. Effect of adherence to newly initiated antiretroviral therapy on plasma viral load. *AIDS,* 2001,15:2109 – 2117.

[55] Braithwaite RS, et al. Adherence, virological and immunological outcomes for HIV-infected veterans starting combination antiretroviral therapies. *AIDS,* 2007,21:1579 – 1589.

[56] Turner K, et al. The impact of needle and syringe provision and opiate substitution therapy on the incidence of Hepatitis C virus in injecting drug users: pooling of United Kingdom evidence. *Addiction* (web published ahead of print) 2011.

[57] Vickerman P, et al. Can needle and syringe programmes and opiate substitution therapy achieve substantial reductions in HCV prevalence? Model projections for different epidemic settings. Submitted 2011.

[58] Degenhardt L, et al. Prevention of HIV infection for people who inject drugs: why individual, structural, and combination approaches are needed. *The Lancet,* 2010,376:285 – 301.

[59] Wood E, et al. Longitudinal community plasma HIV-1 RNA concentrations and incidence of HIV-1 among injecting drug users: prospective cohort study. *BMJ* 2009,338:b1649.

Chapter 2

HIV Surveillance

2.1 HIV diagnoses and AIDS case reporting

This chapter summarises the HIV surveillance systems across European countries, before examining recent surveillance data for what these indicate regarding the burden and pattern of HIV diagnoses in key populations, especially in the five year period 2006 – 10.

2.1.1 AIDS case reporting systems

All European countries developed systems to monitor the number of AIDS diagnoses soon after the first cases were recognised in the early 1980s. However, while AIDS case report data remain useful, their utility has declined over the last 15 years due to better monitoring of HIV diagnoses and the introduction of highly active antiretroviral therapy (HAART) in 1996. The increasing use of HAART since then has resulted in fewer people going on to develop AIDS, and an increase in the recovery of people diagnosed with an AIDS-defining illness. Countries continue to collect AIDS case data, [1] as it provides insight into the extent of late diagnosis and the impact of HIV treatment, particularly if data on CD4 cell counts or viral load are not routinely monitored (in 2010, 25 countries in the region collected data on CD4 cell counts at HIV diagnosis). However, in most European countries the primary focus of surveillance is new HIV diagnoses rather than AIDS cases. In Sweden, for instance, the reporting of AIDS cases ceased to be mandatory in 2000. [1]

2.1.2 HIV diagnoses reporting systems

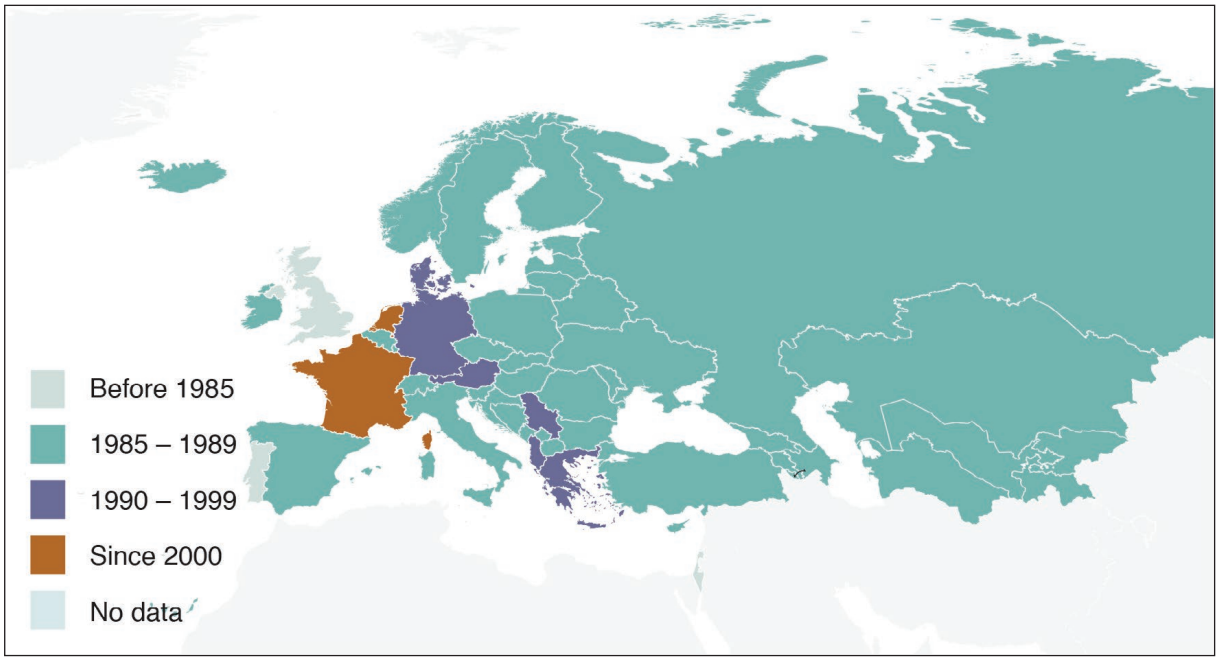
Robust HIV diagnoses reporting data assists countries producing estimates of the numbers of people living with HIV (and thus the prevalence of diagnosed infection), as well as of overall HIV prevalence (i.e. including both diagnosed and undiagnosed). If such reports include CD4 count data, they also provide insight into the extent of late diagnosis. HIV case reporting is a fundamental feature of public health intelligence on the HIV epidemics of Europe. At the same time, it is important to appreciate that country HIV diagnoses reports need not reflect current patterns of HIV transmission, since they include new as well as past infections.

All countries in the WHO European Region, excepting Monaco and Lichtenstein, have established systems for monitoring the number of new HIV diagnoses. wA few countries established HIV diagnoses reporting systems soon after the first tests for HIV infection became available in the early 1980s (Israel, Portugal and San Marino in 1983; the United Kingdom in 1984). Most countries established systems in the latter part of the 1980s and early 1990s. By 1990, 41 (79%) of the 52 countries that now have HIV diagnoses reporting systems had a system operating in at least part of the country. In 11 countries (see Figure 2.1) HIV diagnoses reporting started after 1990, and a few of these countries have only established HIV case reporting systems more recently: Andorra and Malta in 2004; France in 2003; and

Netherlands in 2002. In some countries, systems have undergone significant revision in the way that they operate; with data from different time periods not always being comparable as a result [1]. Spain and Italy have regionally based surveillance with no national coverage as data are not available for all regions. However, the number of regions covered in both of these countries has increased over time, [1] and Italy is reported to be establishing a national HIV notification system which will provide countrywide data in the future. [2]

Countries use different methods to collate their HIV diagnoses data. In particular, risk group information may not always be available or recorded. Due to variations in these systems the data from them needs to be compared cautiously. Firstly, there will differences in the timeliness of the reporting. Secondly, there will be differences in the extent over-reporting and the effectiveness of approaches for de-duplication (which may be especially difficult where anonymous testing for HIV is common). Thirdly, there may be under-reporting of cases, for example due to administrative errors. Finally, national variations in the accessibility of HIV testing will affect the proportion of cases recognised. Therefore, countries with the largest number of diagnosed cases could be those most successful at case finding, rather than those with the worst epidemics (see also Chapter 4).

Figure 2.1 Introduction of HIV case reporting system in Europe by year



Source: EuroHIV; Appendix Table 2.A.1.

The ECDC and the WHO European office, systematically collates HIV diagnoses report data across the region, and we draw upon these data here. [1] Most countries in the region provide data for inclusion in this European data set, with the exception of the Russian Federation (which only provided the total number of diagnoses for 2010), Austria (data not available due to legal issues), and Lichtenstein (where due to the small population public health data are reported to Switzerland). [1] We have added data for the Russian Federation, obtained from the Russian Federal AIDS Centre. [4] When possible, we have combined these data with the aggregate data from the ECDC/WHO data set so as to present the available data for all countries in the region except Austria, Lichtenstein, and Monaco (though the data do not cover all regions of Italy and Spain). HIV diagnoses report data for the period 2006 to 2010 is thus available for the vast majority of the region; with data being available for countries and areas covering 95% (841,383,300/889,201,000) of the population of the WHO European Region.

2.1.3 AIDS cases

By the end of 2010, almost 366,000 people had been reported as diagnosed with AIDS in the region (excluding the Russian Federation). [1] Of these, almost 197,000 were known to have died by the end of

2010. [1] It is thought that around 165,000 people were living with an AIDS diagnosis at the end of 2009. [1] The number of AIDS cases reported has declined in recent years; dropping from 14,147 in 2006 to 7,714 in 2010. [1] This decline almost certainly reflects the ongoing impact of the improved HIV treatment options on disease progression. [5] It may also in part reflect improved case finding resulting in earlier diagnoses and treatment help-seeking.

The decline in AIDS cases overall was also seen in all three sub-regions between 2006 and 2010; from 7,598 to 4,249 in the West; from 652 to 584 in the Centre; and from 5,897 to 2,881 in the East (excluding the Russian Federation). Declines in the number of AIDS cases over this five-year period are seen among both men and women, overall and in each of the three sub-regions; [1] these have occurred even though access to HAART varies greatly across the region. [6] The annual number of AIDS cases associated with injecting drug use or acquired heterosexually have declined markedly in all three of the sub-regions. [1] While the annual number of AIDS cases associated with sex between men has fallen markedly in the West (from 1,838 to 1,222), it has been fairly stable in the East (23 in 2006 to 31 in 2010, excluding the Russian Federation), and has increased slightly in the Centre (from 79 in 2006 to 134 in 2010). [1] Although this is a relatively small number of cases, the reason for this lack of decline needs to be examined.

Analysis of AIDS cases reported in the countries of the EU indicates that migrants from sub-Saharan Africa account for a considerable proportion of the HIV associated with heterosexual exposure and mother to child transmission, and also indicate while MSM cases are largely from within Europe there are also many among men of Latin-America origin. [7]

2.1.4 Number of HIV tests undertaken

HIV testing practices can vary widely between countries.[8 – 10] Many European countries collect data on the number of diagnostic HIV tests undertaken annually, while other countries estimate this number. [11] For 46 countries, there are recent data on the actual or estimated number of HIV tests performed in a year, suggesting an average of 57 HIV tests per 1,000 people annually (Table 2.1). The number of tests undertaken varied across the sub-regions, ranging from 18 per 1,000 people in the Centre (all countries had data) through to 33 per 1,000 in the West (only 16 countries had data) to 119 per 1,000 in the East (all countries had data). However, the annual number of tests performed varied greatly between countries ranging from less than 0.2 (Greece) to 178 (Russian Federation) per 1,000 people. Of all the reported tests undertaken, 53% were reported from the Russian Federation which accounted for only 19% of the population of countries with data on the number of tests.

Table 2.1 Annual number of diagnostic tests for HIV in Europe by sub-region

Sub-region	Number of countries with data on number of tests	Number of HIV tests	Proportion of total	Tests per 1,000 people	Tests per 1,000 people country, range
West	16	10.616,260	22%	33	0.19 to 164
Centre	15	3.382,477	7.1%	17	0.99 to 49
East	15	33.624,312	71%	119	5.9 to 178
Total		47.623,049		57	

Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011; Data on number of tests relates to different years; see Appendix Table 2.A.1.

This variation in rates of diagnostic testing reflects a number of factors including differences in the accessibility of HIV testing, HIV testing practices including occupational requirements, and the stigma associated with HIV and HIV testing.[8 – 10, 12] While these findings should be interpreted cautiously as the numbers of tests conducted relate to different years and are derived from a variety of methods, they show that HIV testing is much less common in the European Centre.

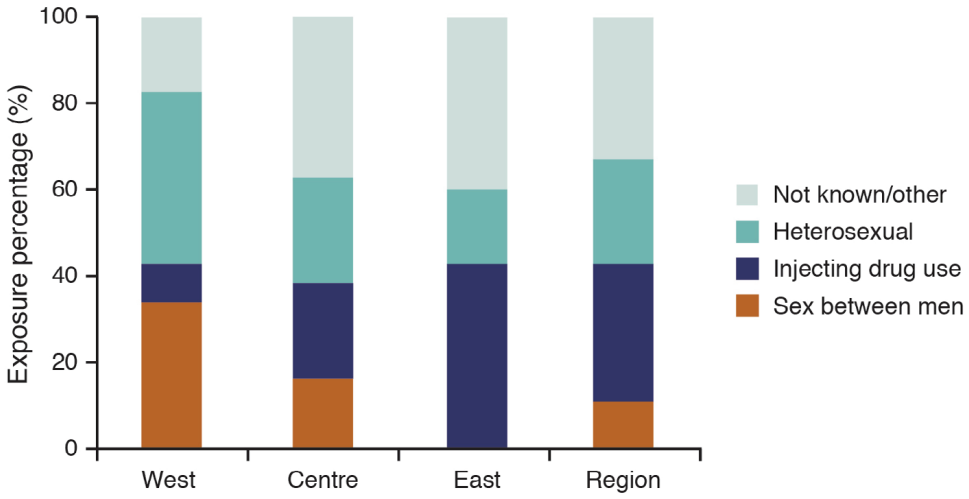
2.1.5 Cumulative number of reported HIV diagnoses

By the end of 2010, over 1,280,000 diagnosed HIV infections had been reported in Europe since the start of reporting. Among these, 30% (379,353) of all diagnoses have been recorded in the West, 3% (33,308) in the Centre, and 69% (867,457) in the East. This figure is an underestimate since country datasets will not include information on all diagnosed infections[3].

The Russian Federation has reported the largest number of HIV diagnoses (630,222), constituting around half (49%) of diagnoses ever reported in the region. The Russian Federation also has the highest population in the region – at over 140 million – accounting for 16% of the total. The cumulative total of reported HIV diagnoses in the Russian Federation equals 4,457 diagnoses per million population. Ukraine, with 5% of the region's population (46 million), has the second largest cumulative number of reported HIV diagnoses (153,108), at 3,329 per million people. There are three other countries where the cumulative reported diagnoses exceed 2,500 per million people: Estonia (5,736 diagnoses reported per million people); Switzerland (4,272 diagnoses reported per million people); and Portugal (2,607 diagnoses reported per million people). Only 3% of the cumulative reported HIV diagnoses are from the Centre, where 23% of the region's population reside. The Centre has lower levels of reported HIV than elsewhere in Europe but also, as noted above, the lowest level of HIV testing (Appendix Table 2. A.2).

Overall, one-third (410,869) of all the HIV diagnoses reported since the start of the epidemic have been associated with injecting drug use. Heterosexual transmission is the next most common exposure category accounting for a quarter of diagnoses (306,966). Sex between men is associated with just over one-in-ten (138,286) of diagnosed infections reported. Mother-to-child transmission, receipt of contaminated transfusions and blood products, and nosocomial infections accounted for around 1% of reported diagnoses. However, nearly 32% of diagnoses reported lacked risk factor information.

Figure 2.2 Cumulative total of major exposure categories among all HIV cases in Europe by sub-region since start of reporting



Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011. Data for most recent years may be revised due to delays in case reporting (Appendix Table 2.A.3).

Regional variation

The proportion of diagnoses associated with the different exposure categories varies across the region. In the West, heterosexual transmission and then sex between men have been the most reported expo-

3 In a few countries, HIV diagnoses reporting systems are not implemented nationally (e.g., Spain, Italy) and administrative errors may have resulted in reports being missed. In addition in 11 countries HIV diagnoses reporting started after 1990 and so more than five years after HIV testing first became available (see above). Data are not currently available for all countries (such as Austria, Lichtenstein and Monaco).

sure categories. In the Centre, heterosexual transmission and then injecting drug use are most reported with few reports attributed to sex between men. In the East, 43% of all reported diagnoses were associated with injecting drug use, 17% associated with heterosexual transmission, and almost 39% are not attributed to any exposure category (Figure 2.2). The vast majority of the reported diagnoses associated with injecting drug use (90%) were from the East, with only 2% from the Centre. Of the diagnoses associated with heterosexual transmission, 49% were from both the West and East sub-region; whereas for the diagnoses associated with sex between men, the almost all (93%) were reported from the West (data not shown).

Age and gender

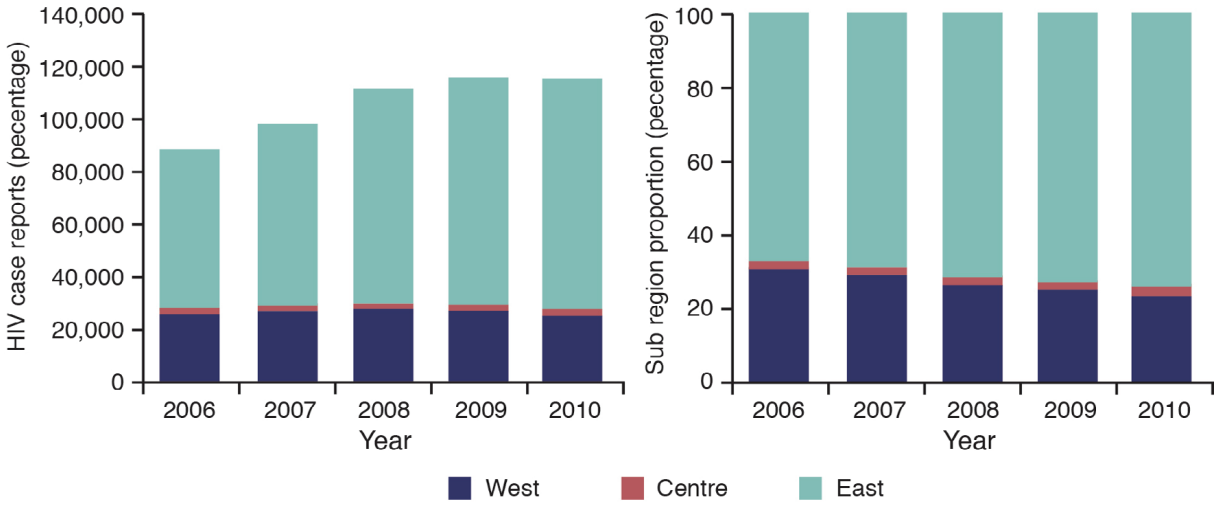
Most HIV diagnoses in Europe to date have been among men, with one-third among women (33%, 424,775, of all reported diagnoses with information on gender). The proportion of women among the cumulative total of diagnoses varies slightly by sub-region: 27% in the Centre; 35% in the East; and 30% in the West. Approximately half of all of those who have received HIV diagnoses in the region were aged less than 30 years at the time of their diagnosis (51%, 586,299, of all the reported diagnoses with information on age at diagnosis).

2.1.6 Trends in reported HIV diagnoses, 2006 – 2010

Between the five year period 2006 – 2010, the annual total of reported HIV diagnoses increased from 89,185 in 2006 to 115,701 in 2010 (Figure 2.3), with over half a million (533,181) diagnoses reported during the five-year period. There was an annual average of approximately 107,000 diagnoses, equating to an average of 127 new diagnoses each year for every million people living in the region. It should also be noted that the potential for reporting delays mean that the number of diagnoses of in the most recent years, particularly 2010, may yet be revised upwards.

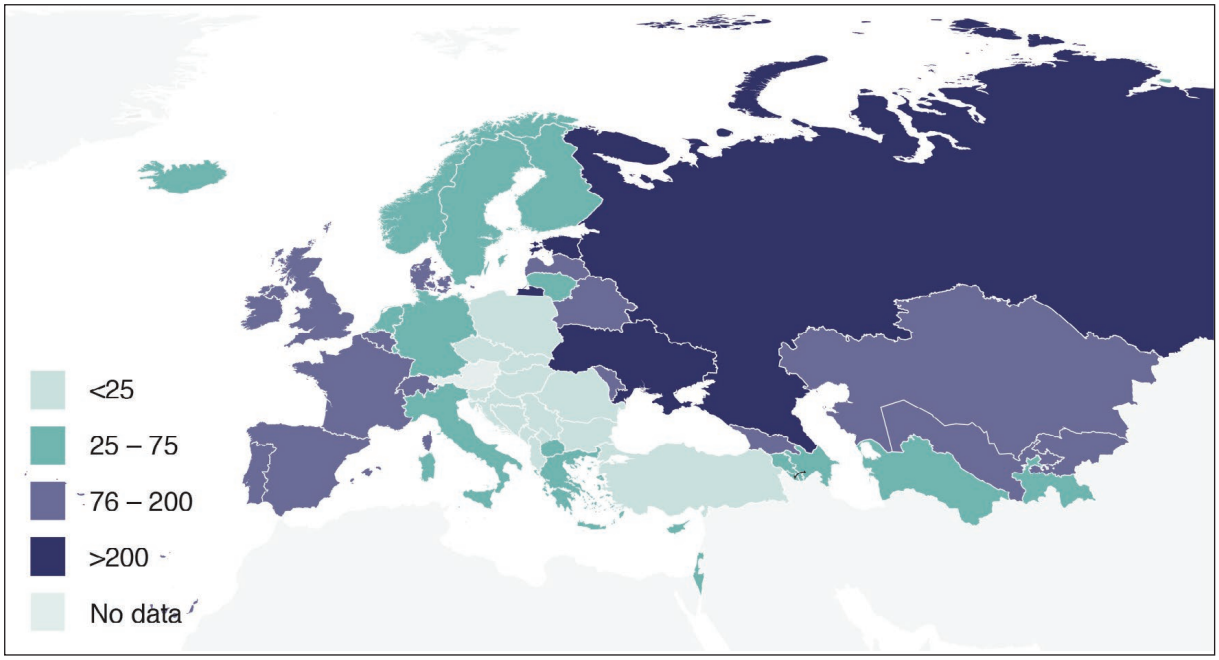
The greatest burden of newly diagnosed HIV infections during recent years has been in the East with an annual average of 77,371 new diagnoses (273 per million people) compared to 27,046 in the West (74 per million people) and 2,220 in the Centre (11 per million people). Overall, the countries with the highest annual average number of reported new HIV diagnoses during this period were: Estonia (392 per million people); Russian Federation (372 per million people); and the Ukraine (328 per million people) (Figure 2.4, Appendix Table 2.A.3). While the annual number of diagnoses reported has been relatively stable in the West and Centre, it has increased in the East, from 60,941 in 2006 to 87,564 in 2010. In 2010, 76% of diagnoses were reported from the East (Figure 2.4).

Figure 2.3 HIV case reports in Europe and proportions by sub-region: 2006 – 2010



Source: Appendix Table 2.A.4.

Figure 2.4 Annual average case reports per million in Europe (2006 – 10)



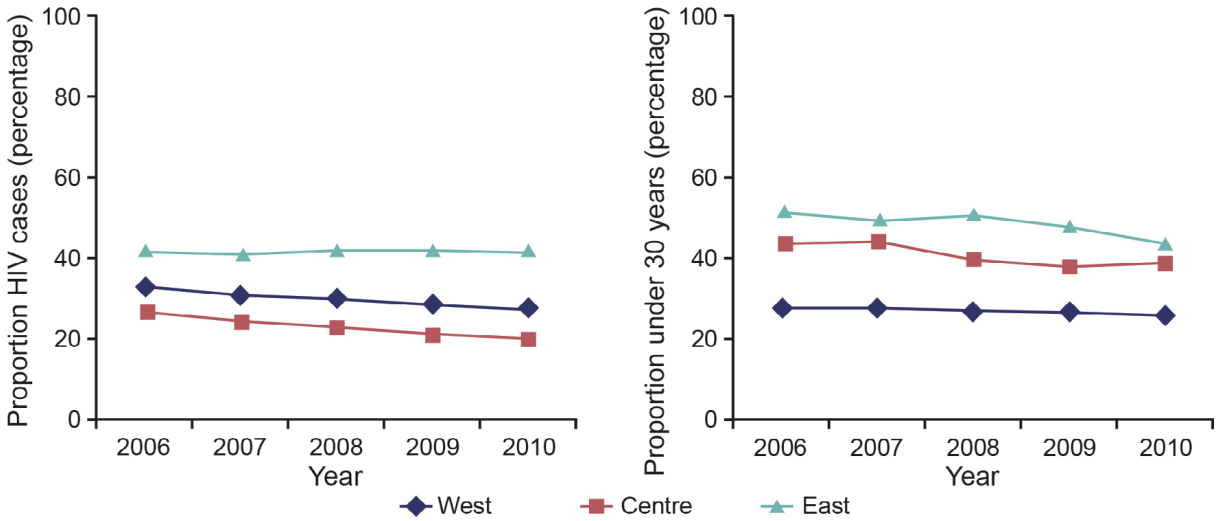
Source: Appendix Table 2.A.6.

Gender and age

Between 2006 and 2010, the proportion of women among reported HIV diagnoses has decreased in the West and Centre, from 33% to 27% and from 27% to 19% respectively. In the East, the proportion of women among diagnoses during this period remained the same, at 41% (Figure 2.5). More women are being diagnosed in the East than elsewhere, with 79% of the reported diagnoses among women over the five year period being reported there.

The proportion of reported HIV diagnoses in people under 30 years of age gradually declined between 2006 and 2010, suggesting that the average age at diagnosis is increasing over time. This decline was seen in the Centre and East – from 43% to 38% in the Centre, and from 51% to 43% in the East – but not in the West 27% aged under 30 over the five year period (Figure 2.5). Thus, those diagnosed in the West in recent years have generally been older than those diagnosed elsewhere in region, with 32% of the reported cases among those of aged 30 years and over being from the West during the five year period (compared with 25% of all reported diagnoses).

Figure 2.5 Proportion HIV case reports among women, and by age and by European sub-region (2006 – 10)



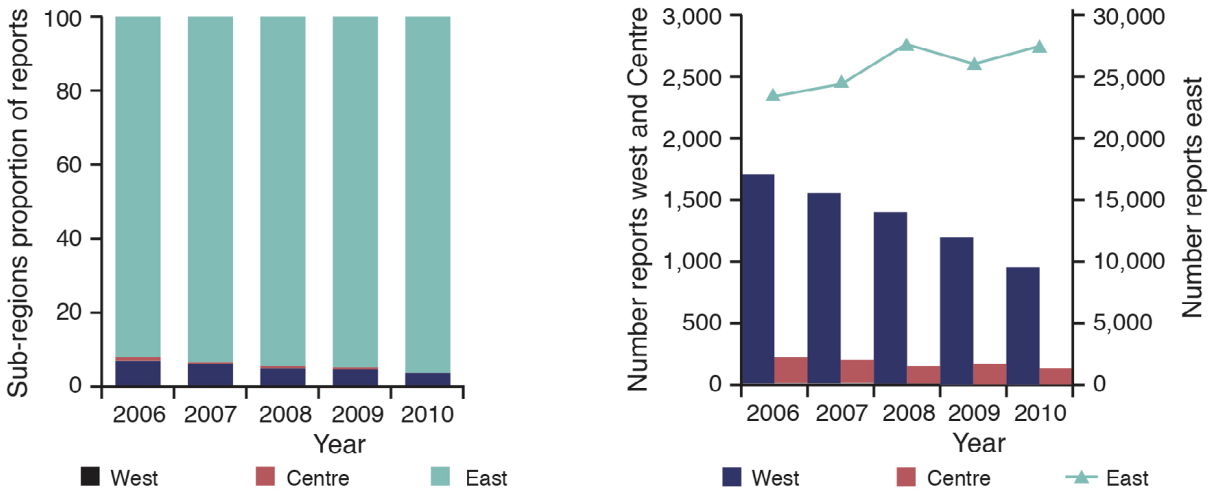
Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011. Data for most recent years may be revised due to delays in case reporting (Appendices A.2.4 and A.2.5).

2.1.7 Distribution of HIV diagnoses by exposure category, 2006 – 10

HIV diagnoses associated with injecting drug use

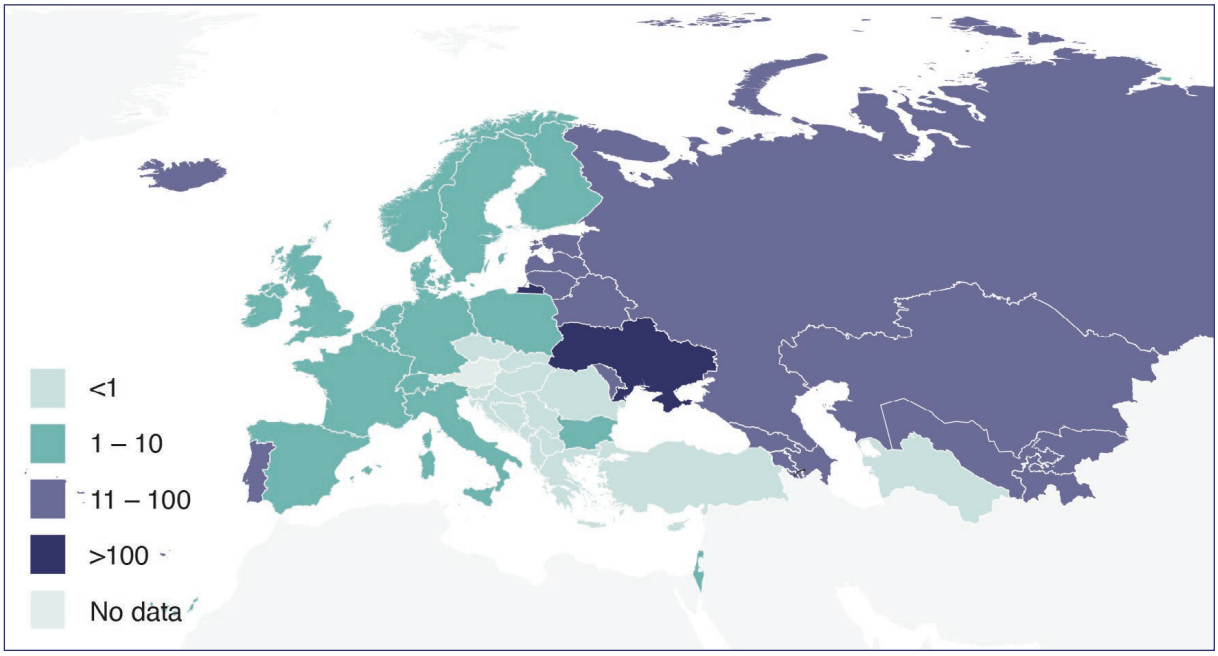
Between 2006 and 2010, 25% (133,900) of reported HIV diagnoses were associated with injecting drug use. This proportion varies by region, with 5% of diagnoses in the West associated with injecting drug use, 7% in the Centre and 33% in the East. Overall, over 90% of the reports where the exposure was injecting drug use were from the East, and this proportion has increased over time. Of 28,238 (96%) reported diagnoses associated with injecting drug use in 2010, 27,211 were reported from the East, 921 from the West and only 106 from the Centre. The number of reports associated with injecting drug use has increased in recent years in the East, while it has been falling in the West and Centre (Figure 2.6).

Figure 2.6 HIV case reports and proportion associated with injecting drug use (2006 – 10)



Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011. Data for most recent years may be revised due to delays in case reporting (Appendix A.2.6).

Figure 2.7 Average HIV case reports in Europe attributed to injecting drug use per million (2006 – 10)



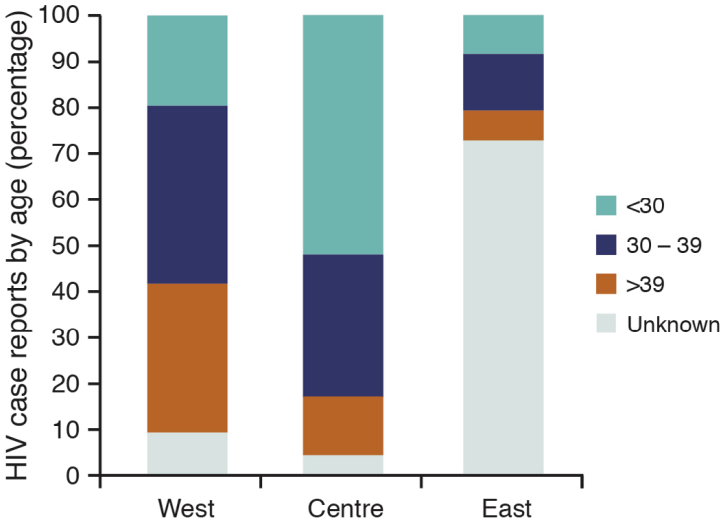
Source: Appendix A.2.6

Looking at the period 2006 – 2010, there was an annual average of 89 reported HIV diagnoses associated with injecting drug use per million people in the East, compared to 3.6 per million in the West and 0.8 per million in the Centre. The countries with the highest levels of reported diagnosed cases associated with IDU during this period were the Ukraine, (153 per million people), Russian Federation (98 per million people), and Kazakhstan (78 per million people). The focus of HIV among PWID is in the East (Figure

2.7), where almost all countries report large numbers of such cases. However, a number of countries in Centre and West of Europe have reported outbreaks of HIV among PWID in recent years. [11] In Greece, for example, there was been a marked increase in the number of diagnoses associated with injecting drug use reported during 2011, while Romania has also documented recent outbreaks of HIV among PWID. [11]

The reported HIV diagnoses associated with injecting drug use were predominantly male, with only 19% reported among women in the East in 2010, with this proportion ranging from 22% in the West to 14% in the Centre (data not shown). The proportion aged under 30 years varies by sub-region, with the majority (57%) of cumulative cases (2006 – 2010) being aged under 30 in the Centre, compared with 27% in the East and 19% in the West. This distribution did not change significantly across the period. In the West, data on the country of origin of cases is often available, and in 2010 62% were diagnosed in their country of origin, while 4.3% originated from elsewhere in the West and 20% (181) in the Centre or East.

Figure 2.8 Cumulative HIV case reports in Europe attributed to injecting drug use by age and sub-region (2006 – 10)



Sources: ECDC / WHO European Office HIV Report 2011. Data excludes Austria, Liechtenstein, Monaco, Russian Federation and Turkmenistan (Appendix A.2.6).

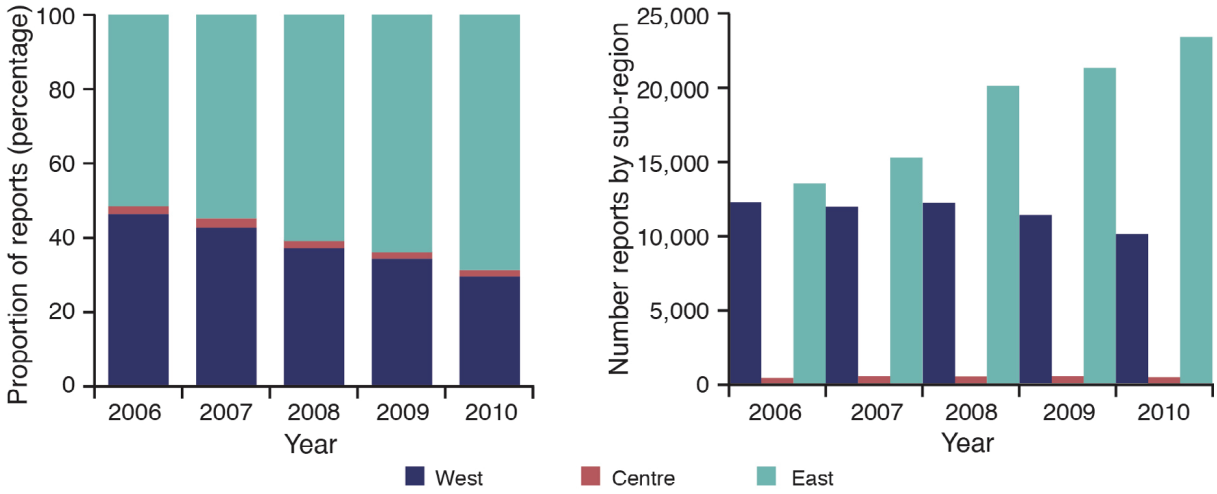
HIV diagnoses associated with heterosexual transmission

During the five year period from 2006 – 2010, heterosexual exposure was reported for 29% (155,639) of HIV diagnoses reported in the region. In the West, the proportion and number of reported diagnoses associated with heterosexual exposure has shown a slight decline between 2006 and 2010, with 10,214 reports in 2010 compared to 12,281 in 2006 (Figure 2.9). In the Centre, the number of reported diagnoses associated with heterosexual exposure has been relative stable, with 605 reports in 2010. The East has seen an increase in the proportion, and number, of diagnoses attributed to heterosexual exposure, with reports increasing from 13,610 in 2006 to 23,499 in 2010 (Figure 2.10). There was an annual average of 66 reported HIV diagnoses associated with heterosexual exposure per million people in the East, compared to 32 per million in the West and 3 per million in the Centre. The countries with the highest annual average number of reported new HIV diagnoses associated with heterosexual exposure during the period 2006 to 2010 were Ukraine (161 per million people), Republic of Moldova (145 per million people) and Portugal (91 per million people) (Figure 2.10, based on data in Appendix 2.A.6).

The proportion of the reports associated with heterosexual exposure that are women varies by sub-region. The highest proportion is in the East and was constant over the period, with 63% of diagnoses among women in 2006 and 61% in 2010. The West had the second highest proportion, with 56% of diagnoses in 2006 and 52% in 2010 being women. The Centre reported 46% of diagnoses among women in 2006 and 40% in 2010. The proportion of reports associated with heterosexual exposure among people

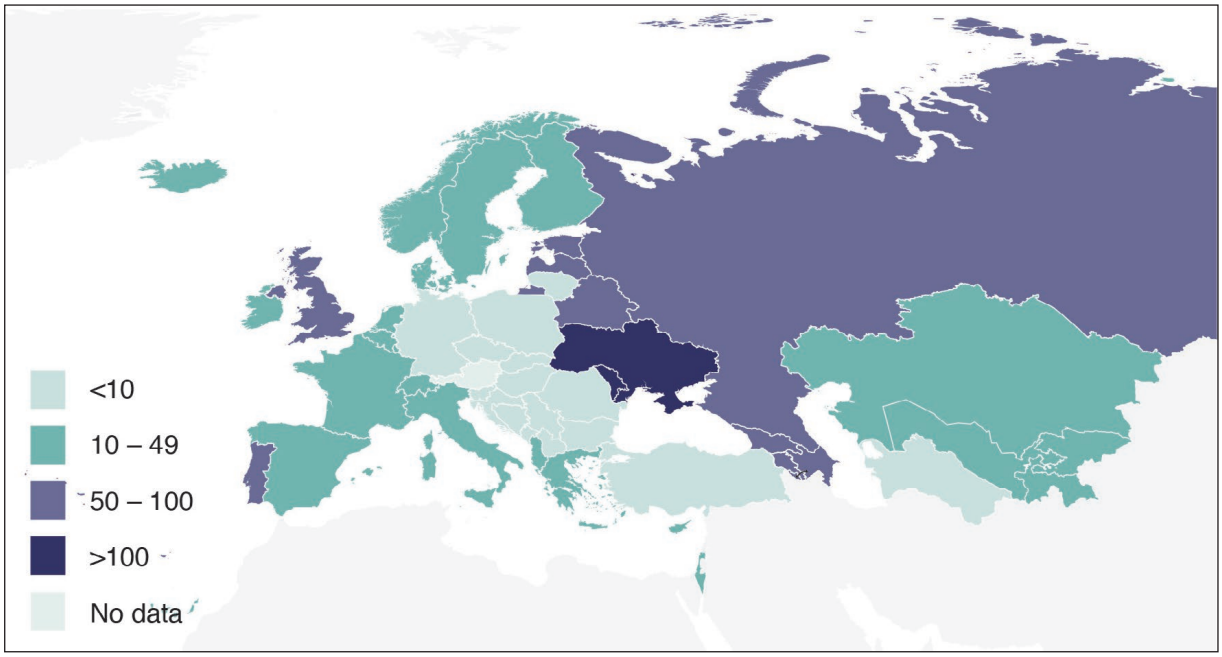
aged 30 years or less at diagnosis declined in all three sub-regions during this period. In 2010 this proportion was highest in the East (43%), then the Centre (36%) and the West (22%).

Figure 2.9 HIV case reports and proportion attributed to heterosexual exposure (2006 – 10)



Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011. Data for most recent years may be revised due to delays in case reporting.

Figure 2.10 Average HIV case reports in Europe attributed to heterosexual sex per million (2006 – 10)

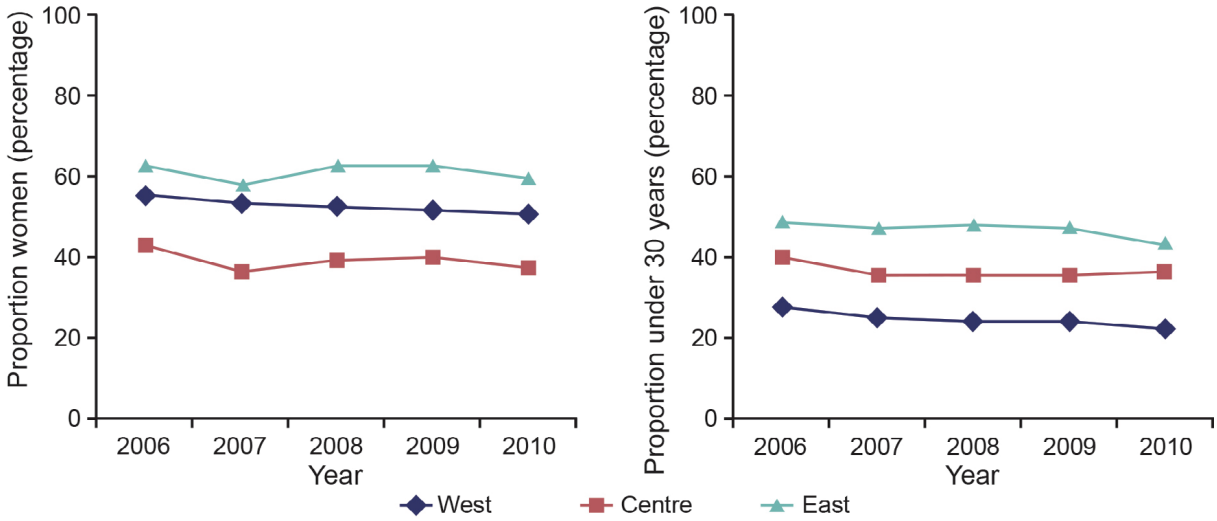


Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011. Data for most recent years may be revised due to delays in case reporting (Appendix A.2.6).

In many systems, particularly in the West, reported HIV diagnoses attributed to heterosexual transmission are further categorised into exposure sub-categories: people from countries with generalised HIV epidemics; people with partners from countries with generalised HIV epidemics; people with high-risk partners (such as people who inject drugs or men who have had sex with men), and other or undetermined. This data should be interpreted with caution as it is not collected by all countries, is often incomplete, and is not collected at all in some sub-regions (such as the East). In the West over a third of the reported HIV diagnoses associated with heterosexual transmission have information indicating that they are among people who originate from a country with a generalised HIV epidemic (with these accounting for over a quarter of the diagnoses reported from Belgium, Finland, Germany, Greece, Ireland, Israel, Luxembourg, Malta, Netherlands, Portugal, Spain, Sweden, Switzerland, and United Kingdom), and over 10% are among people whose partner originates from a country with a generalised HIV epidemic (with

these accounting for over a quarter of cases in Denmark and France). These cases could have contracted the infection either abroad, likely in the country with the generalised epidemic itself, or at home in Europe with a partner from abroad.

Figure 2.11 HIV case reports in Europe attributed to heterosexual sex among women and by age (2006 – 10)

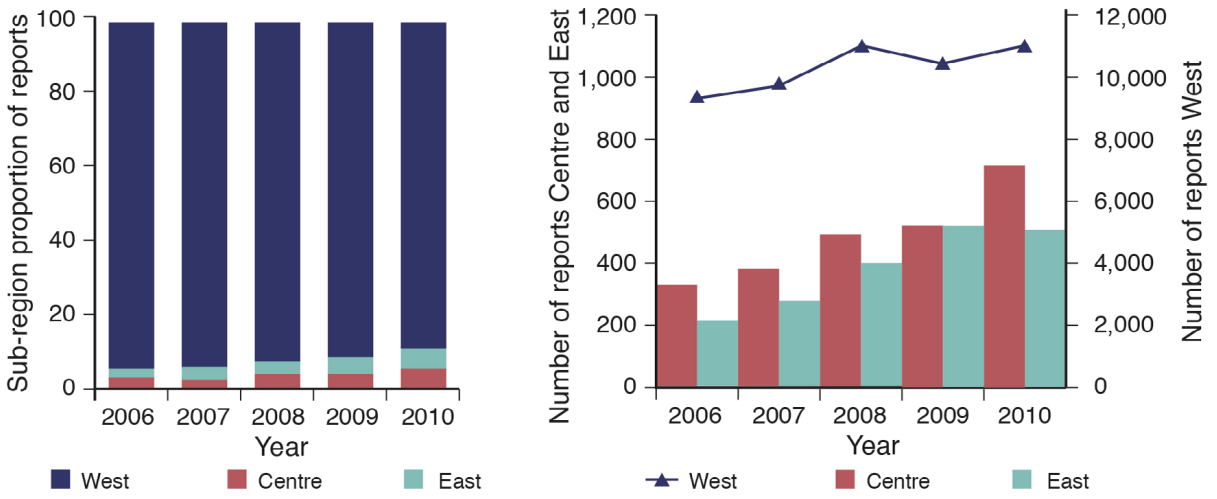


Sources: ECDC / WHO European Office HIV Report 2001. Data excludes Austria, Liechtenstein, Monaco, Russian Federation and Turkmenistan. Data for most recent years may be revised due to delays in case reporting.

HIV diagnoses associated with men who have sex with men

Between 2006 and 2010, 10% of HIV diagnoses were attributed to sex between men. In the West, 36% of diagnoses reported were attributed to sex between men, 22% in the Centre and 0.5% in the East. Of the 53,244 reports associated with sex between men between 2006 and 2010, 91% (48,841) were from the West, though this proportion has declined over time from 94% in 2006 to 89% in 2010 (Figure 2.12). The reported HIV diagnoses associated with sex between men are concentrated in the West, where between 2006 and 2010 the annual average was 27 diagnoses per million people compared with only 2.5 in the Centre and 1.4 in the East. The Centre and East sub-regions have, however, seen marked increases in such reported diagnoses over this period, with reports in the Centre increasing from 330 in 2006 to 722 in 2010 and in the East from 215 to 529.

Figure 2.12 HIV case reports in Europe and proportion attributed to sex between men (2006 – 2010)

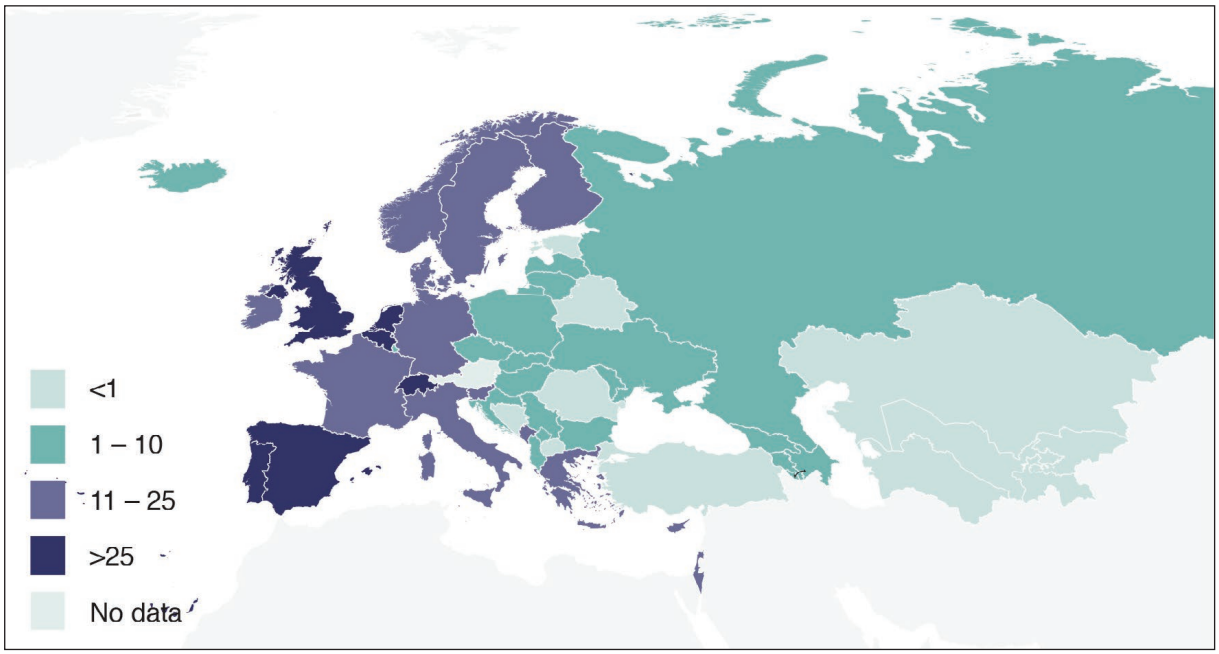


Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011. Data for most recent years may be revised due to delays in case reporting (Appendix A.2.6).

The countries with the highest average annual number of new HIV diagnoses associated with sex between men were the United Kingdom (43.4 per million people), the Netherlands (43.2 per million

people) and Spain (37.3 per million people) (Figure 2.13). In the West, data on country of origin is often available, and in 2010, 68% were diagnosed in their country of origin, while 5.8% of diagnoses were in men originating from elsewhere in the West, and 2.8% (281) among men from the Centre or East. This might reflect the movement for MSM towards seemingly more liberalised social environments in the region (see also Chapter 4).

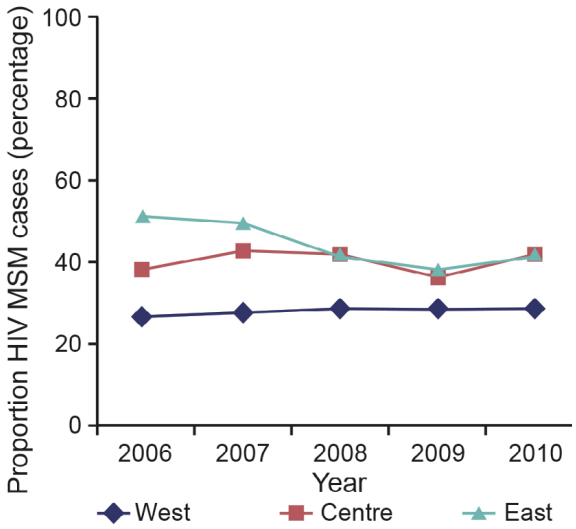
Figure 2.13 Average HIV case reports in Europe attributed to sex between men per million (2006 – 10)



Source: Appendix A.2.6

The proportion of HIV diagnoses associated with exposure through sex between men in men aged 30 years or less varies by sub-region. Between 2006 and 2010, the proportion aged under 30 years was lower in the West than elsewhere, and changed little over time fluctuating between 27% and 29% (Figure 2.14). In the Centre, the proportion fluctuated between 36% and 42%. The proportion aged under 30 years in the East has declined over time, from 50% in 2016 to 39% in 2010. There was wide variation between countries in the proportion of reports associated with exposure through sex between men that were aged under 30 years at diagnosis between 2006 and 2010 from a 19% in Finland to 62% in Belarus.

Figure 2.14 Proportion of HIV diagnoses in Europe attributed to MSM aged 30 years or less (2006 – 10)

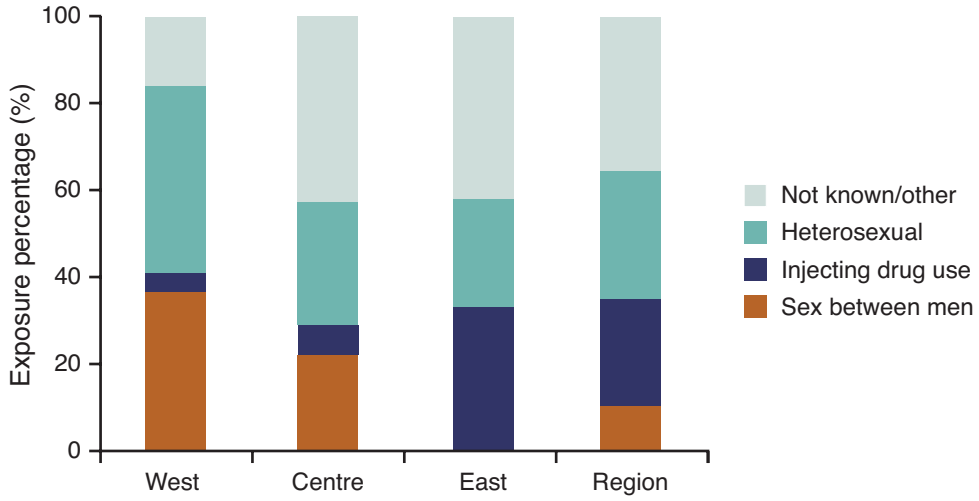


Sources: ECDC / WHO European Office HIV Report 2011 and excludes Austria, Liechtenstein, Monaco, Kazakhstan, Russian Federation, Turkmenistan and Ukraine). Data for most recent years may be revised due to delays in case reporting.

Those with missing exposure data

Between 2006 and 2010, around 35% (187,202 of 533,181) of reported HIV diagnoses in Europe were not allocated to a main exposure category (sex between men; injecting drug use; heterosexual; mother-to-child; haemophiliac/transfusion recipient; nosocomial infection). Only a small minority of these might be due to 'other' exposures, with most lacking information on exposure. In total, between 2006 and 2010, proportionally fewer HIV diagnoses reported in the West lacked information on exposure (15%) compared to the Centre (42%) and East (42%) (Figure 2.15), with the proportions lacking this information changing little over the last five years (data not shown). This lack of information limits the capacity to monitor and compare HIV patterns over time. Overall, information on exposure category is available for 90% or more of reports from 22 countries, and in another 16 countries it is available for between 80% and 90% of diagnoses reported. A substantial lack of exposure information is limited to San Marino, Poland and Georgia (where more than 75% of HIV diagnoses have missing exposure data), Russian Federation (where exposure data is missing for 57%), and France, Greece, Romania, Turkey and Uzbekistan (with exposure data missing in over 30% of diagnoses).

Figure 2.15 Major exposure category among cumulative HIV case reports in Europe (2006 – 10)



Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011. Data for most recent years may be revised due to delays in case reporting (Appendix A.2.6).

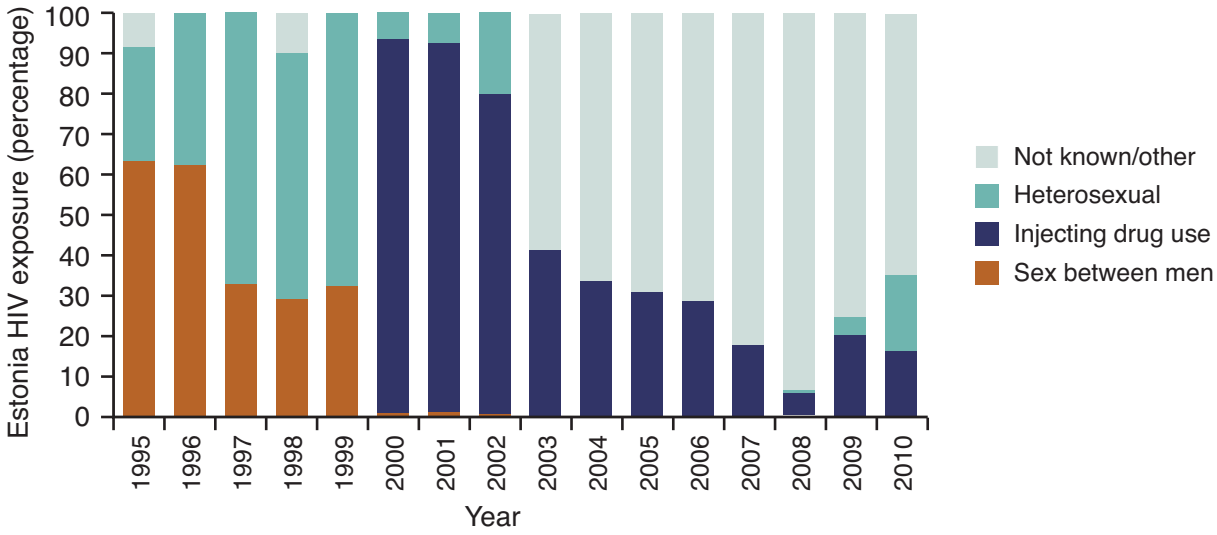
2.1.8 Case Studies: Estonia, Tajikistan, Ukraine, and United Kingdon

We select here four brief cases studies reflecting changing patterns in HIV diagnoses among key populations: Estonia, Tajikistan, Ukraine and the United Kingdom. To do this, we extract on data from EuroHIV and ECDC reports on the proportion of HIV diagnoses in these countries in the fifteen year period 1995 – 2010.

Case study: United Kingdom and Ukraine

In the United Kingdom, the number of diagnoses has grown from 2,655 in 1995 to 6,654 in 2010, though in the last 5 years the total number of reports has declined from the 7,451 in 2006. The most commonly reported exposure category in the mid-1990s was MSM, however by the late 1990s this was overtaken by heterosexual exposure. This change reflected a marked increase in the number of infections diagnosed in individuals who had migrated from or had close links to countries with generalised epidemics [1]. The proportion of diagnoses associated with injecting drug use was low throughout the whole period and the number of these diagnoses has declined in recent years from 198 in 2005 to 141 in 2010. The United Kingdom has a low proportion of diagnoses associated with other or unknown exposure categories. The proportion of new diagnoses associated with sex between men has gradually increased since 2004 and is currently almost equal to the proportion associated with heterosexual exposure (Figure 2.16). While the absolute number of HIV diagnoses attributed to heterosexual exposure has declined from 4,329 in 2006 to 3,018 in 2010 the absolute numbers of reports attributed to sex between men has been more consistent (2,590 in 2006 and 2,702 in 2010). These data thus suggest that the HIV epidemic in the United Kingdom is in a concentrated phase—mostly affecting MSM and migrants.

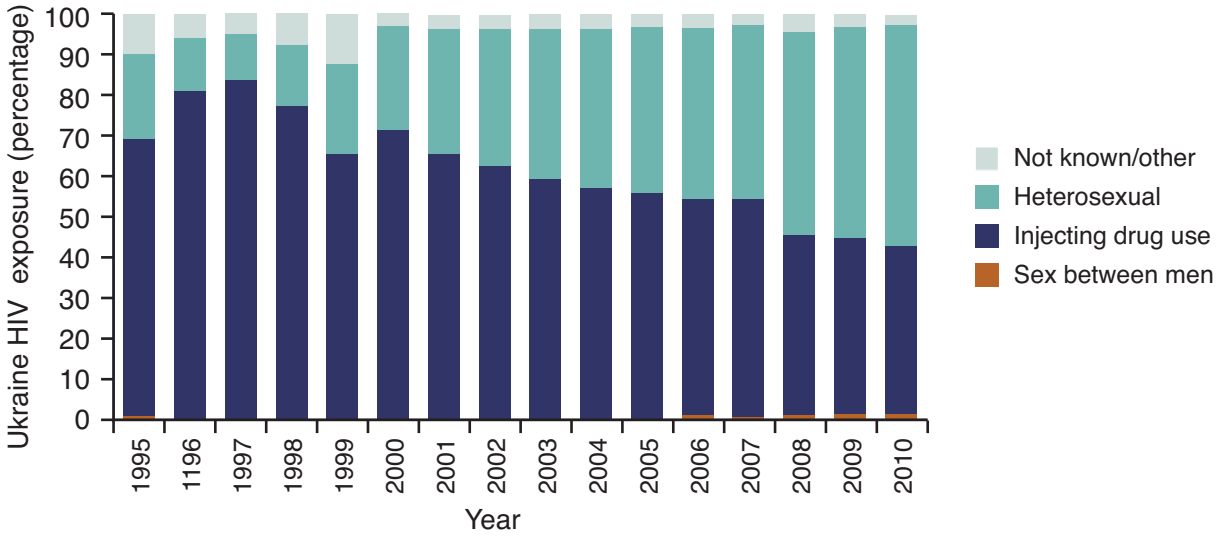
Figure 2.16 Exposure categories among HIV case reports in the United Kingdom



Sources: Data extracted from EuroHIV and ECDC reports on the proportion of HIV diagnoses in UK in the fifteen year period 1995 – 2010.
Note: 1995 to 2007 data are by year of report, 2008 to 2010 data are by year of diagnosis. Data for most recent years may be revised due to delays in case reporting.

In the Ukraine, the total number of diagnoses reported during 1995 was 1,490, and there were 16,643 new diagnoses made in 2010, with only a small proportion of these without exposure category information. In the last 5 years, the absolute number of diagnoses reported has increased from 13,256 in 2006. The vast majority of diagnosed HIV infections in the Ukraine have been among PWID; with this exposure being the most common one throughout the 15 year-period. However, the absolute number of HIV case reports attributed to injecting drug use declined between 2006 and 2010 (7,127 to 6,938), while cases attributed to heterosexual exposure have increased by over 60% (from 5,646 to 9,122). While the majority of cases among PWID remain among men, the majority of heterosexual cases are among women. There have been very few infections reported associated with sex between men, though it is possible this might reflect underreporting due to stigma faced by MSM.

Figure 2.17 Exposure categories among HIV case reports in Ukraine (1995 – 2010)

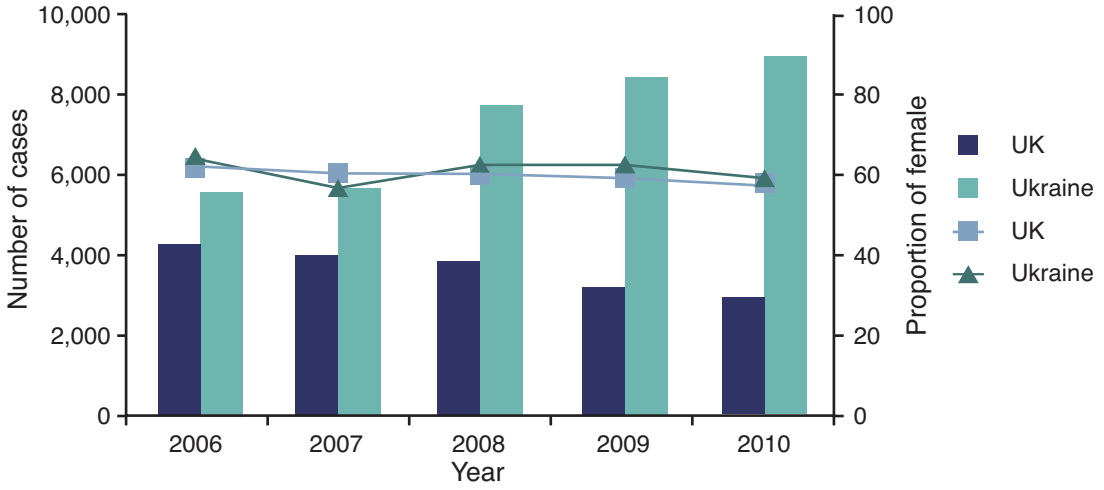


Source: Data extracted from EuroHIV and ECDC reports on the proportion of HIV diagnoses in Ukraine in the fifteen year period 1995 – 2010.
Note: 1995 to 2007 data are by year of report, 2008 to 2010 data are by year of diagnosis. Data for most recent years may be revised due to delays in case reporting.

Figure 2.18 shows that the proportion of HIV diagnoses attributed to heterosexual exposure among women is at a similar level in United Kingdom and Ukraine. However, the absolute number of cases is decreasing in the United Kingdom and increasing in Ukraine. Data from the Ukraine suggests that the HIV epidemic is growing and though it has been concentrated—among PWID—it would now appear to

be starting to generalise with increasing numbers of diagnoses among women who have been acquired to HIV through heterosexual sex.

Figure 2.18 HIV case reports and heterosexual exposure among females: United Kingdom and Ukraine (2006 – 13)

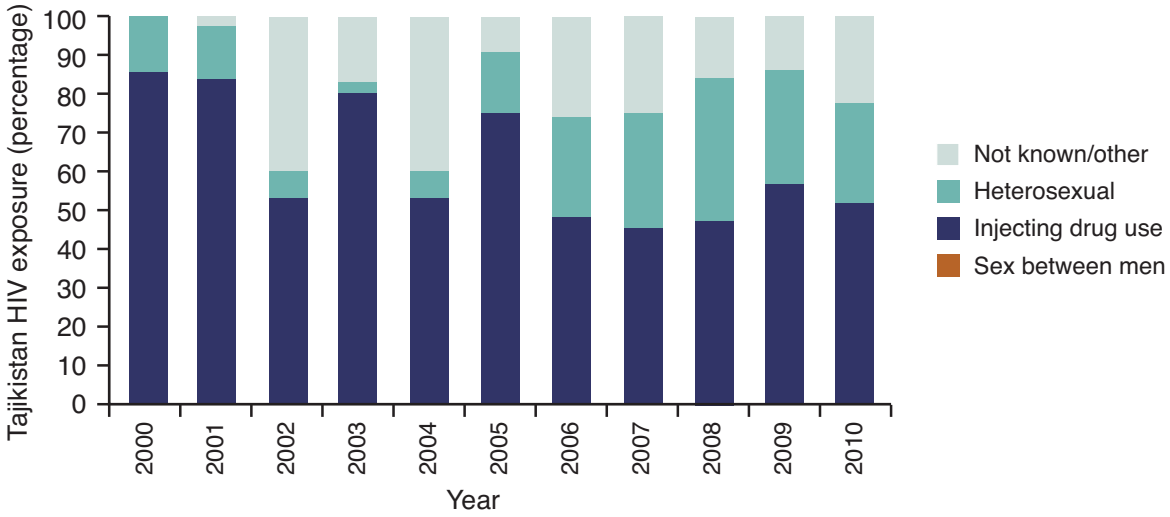


Source: Data extracted from EuroHIV and ECDC reports.

Case study: Tajikistan

The total number of HIV diagnoses made in Tajikistan ranged from seven in 2000 to 1,004 in 2010. Accounting for population size, this is an increase from just over one diagnosis per million population in 2000 to 147 diagnoses per million population in 2010. To date, no cases have been attributed to sex between men and injecting drug use has been the most commonly attributed route of transmission. Since 2006, heterosexual transmission is becoming a more important route with 52 cases reported in 2006 and 249 in 2010. The proportion of cases with other or unknown transmission routes remains reasonably high (>10%).

Figure 2.19 Exposure categories among HIV case reports in Tajikistan (2000 – 10)



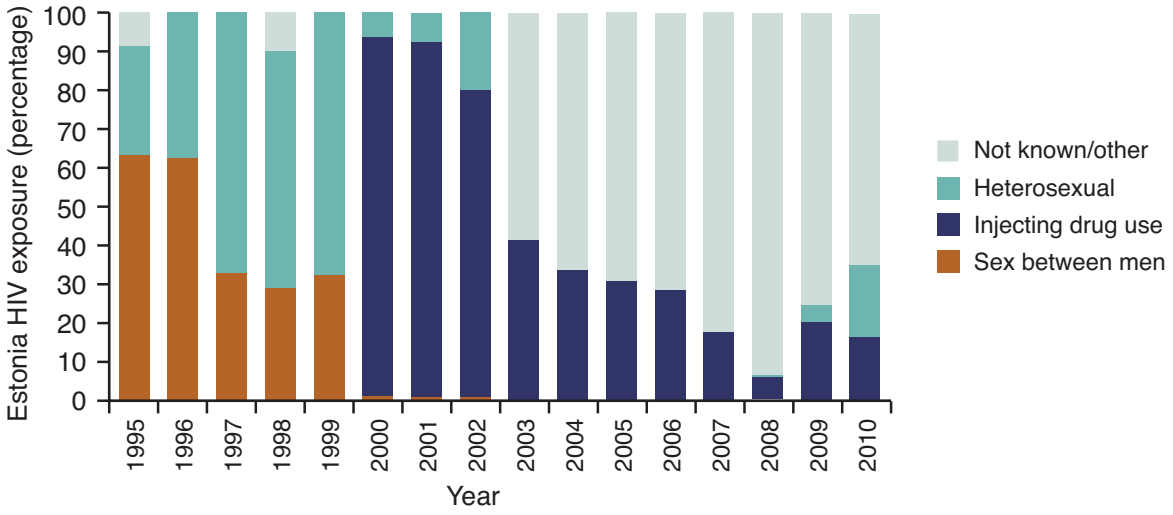
Source: Data extracted from EuroHIV and ECDC reports.
Note: 1995 to 2007 data are by year of report, 2008 to 2010 data are by year of diagnosis. Data for most recent years may be revised due to delays in case reporting. Data on risk factor only reported from 2000.

Case study: Estonia

The total number of HIV diagnoses made in Estonia increased from 12 or less during 1995 – 99 to 372 in 2010, peaking in 2001 with a total of 1,474 diagnoses. Accounting for population size, this is an

increase from 8 diagnoses per million population in 1995, to 1,099 diagnoses per million population in 2001, decreasing to 277 diagnoses per million population in 2010. Injecting drug use was the major route of transmission from 2000 for several years, although since 2003, the proportion of new diagnoses not attributed to any route grew from nearly 60% to over 90% in 2009 and was around 65% in 2010. This lack of data severely undermines an understanding of the HIV epidemic in Estonia and efforts to respond to it. In 2007 there were no cases attributed to heterosexual exposure, three in 2008, 17 in 2009 and 69 in 2010. Prior to this, cases associated with heterosexual exposure were not reported consistently.

Figure 2.20 Exposure categories among HIV case reports in Estonia (1995 – 2010)



Source: Data extracted from EuroHIV and ECDC reports.
Note: 1995 to 2007 data are by year of report, 2008 to 2010 data are by year of diagnosis. Data for most recent years may be revised due to delays in case reporting.

2.2 Assessing HIV prevalence and risk behaviour

In order to understand the dynamics of HIV epidemics in key populations, including undiagnosed infections, it is important to directly assess HIV prevalence and the extent of risk practices. According to WHO guidelines on second-generation HIV surveillance, surveys to directly measure HIV prevalence and risk should be undertaken periodically in all countries, and regularly in countries with concentrated epidemics. [13] We examine here, whether countries have undertaken targeted studies to directly assess HIV prevalence and/or risk behaviours in key populations of PWID, SWs and MSM. We also explore whether countries have monitored their HIV epidemics over time by generating estimates of HIV prevalence and risk behaviour through repeated studies or through comparable studies undertaken at different points in time. We also comment on the quality of the studies directly measuring HIV prevalence through selecting the 'best' available estimates (see Chapter 1 for further description). The characteristics of the studies included in our analysis here are summarised in Appendices 2.A.7 – 10.

According to the studies we identified through the systematic literature review (see Chapter 1 for a description of methods), and during the period 2000 – 2010, more studies directly assessing HIV prevalence and risk behaviour were undertaken among PWID (149 studies) than SWs (101 studies) or MSM (67 studies). There was little difference in number of studies conducted by region. More studies have been conducted among PWID (16 studies) and SWs (17 studies) in the Russian Federation than any other country, with the United Kingdom conducting a notably higher number of studies across all vulnerable and key populations.

2.2.1 People who inject drugs

Almost all (48, 96%) countries in Europe had undertaken a study to directly assess HIV prevalence and/or risk behaviour among PWID between 2000 and 2010, with the exceptions of Iceland and Turkmenistan. Of the 48 (96%) countries in Europe having undertaken a study to assess HIV prevalence, 19 were

in the West (95% of countries in that sub-region), 15 were in the Centre (all countries of that sub-region), and 14 were in the East (93% of the countries in that sub-region). Recent (that is, within the last 3 – 5 years) estimates of HIV prevalence were found among PWID in the majority of countries (44), with the exception of Ireland, Israel, Latvia and Lithuania where estimates dated back to 2003.

Of the HIV prevalence studies among PWID identified (149), 48 were selected as constituting 'best estimates'. The characteristics of these studies show that more than half had national coverage (n=29). The majority of studies in the West (13) had national coverage comprising large samples. [14 – 15] This in part reflects the better established sentinel surveillance systems in place at drug treatment centres or HIV testing clinics. Just over half the studies had national coverage in Central European countries, [14, 16 – 18] 3 with large samples from treatment centres (>1,000), for instance, in the Czech Republic (1,363) and Poland (1,713). Just under half (7) of the studies in the East had national coverage, with large samples recruited from drug treatment centres in Latvia and Lithuania (>1000). [14, 19 – 22] For practical reasons it is easy to recruit PWID from treatment centres but large community samples were also reported, including in Kazakhstan (4,860) and Ukraine (6,459), Georgia (1,289), Belarus (1,770), Bosnia and Herzegovnia (780), Bulgaria (1,421) and Serbia (960). [17, 20, 22 – 26] No large community samples were reported in the West were included as a 'best estimates'. Small sample sizes were documented in Ireland, Slovakia and Cyprus, possibly reflecting the small population sizes. [14] While national coverage will provide a more representative estimate of national HIV prevalence is not necessarily an appropriate indicator of quality of the surveillance system, if a population is known to be concentrated, sampling a single city may be sufficient. Estimates of the size and location of the population at risk are thus needed in order to assess the most appropriate study site. In some cases where the geographic coverage was reported to be national, the sample size was also small, thus limiting the confidence with which inferences can be made to the wider population (for example, studies in Turkey and Cyprus).

In the absence of a representative sampling frame, a key consideration when estimating HIV prevalence among PWID is the recruitment and sampling strategy. Sampling strategies that recruit from multiple sites and networks will minimise geographic and network bias and surveys recruiting from a broad range of locations may be able to claim wider applicability of their results than those recruiting from only one or two settings. [27 – 28] In particular studies that only recruit from clinical settings may find their samples biased towards higher risk individuals or those who feel they need to access testing or treatment services. Evidence suggests that drug users in treatment systematically differ to those not currently in treatment. [29 – 33] Sampling PWID from OST clinics may for example bias the sample away from stimulant injectors who may form an important group, albeit with different characteristics and risks than those faced by opiate users. [33] A wide range of recruitment approaches were used in the 48 studies selected as 'best estimates': from recruitment via clinical settings to low threshold services and community based recruitment. Recruitment took place via treatment drug or low threshold NSP programmes in all the studies in the West, except for France where recruitment took place in both community and low-threshold services. In some countries, such as in the United Kingdom, Luxembourg, Greece, Sweden and Lithuania, recruitment took place from multiple sites including Drug treatment, HIV testing centres and needle exchanges and prison. [14, 34] In contrast the majority (9/14) of the best estimate studies in the East recruited from community settings. [14, 19 – 20, 22 – 23, 34 – 36] In Case Studies 2.1 and 2.2 below, we show how different recruitment strategies, as well as the effect of different sample sizes, can result in variance in HIV estimates.

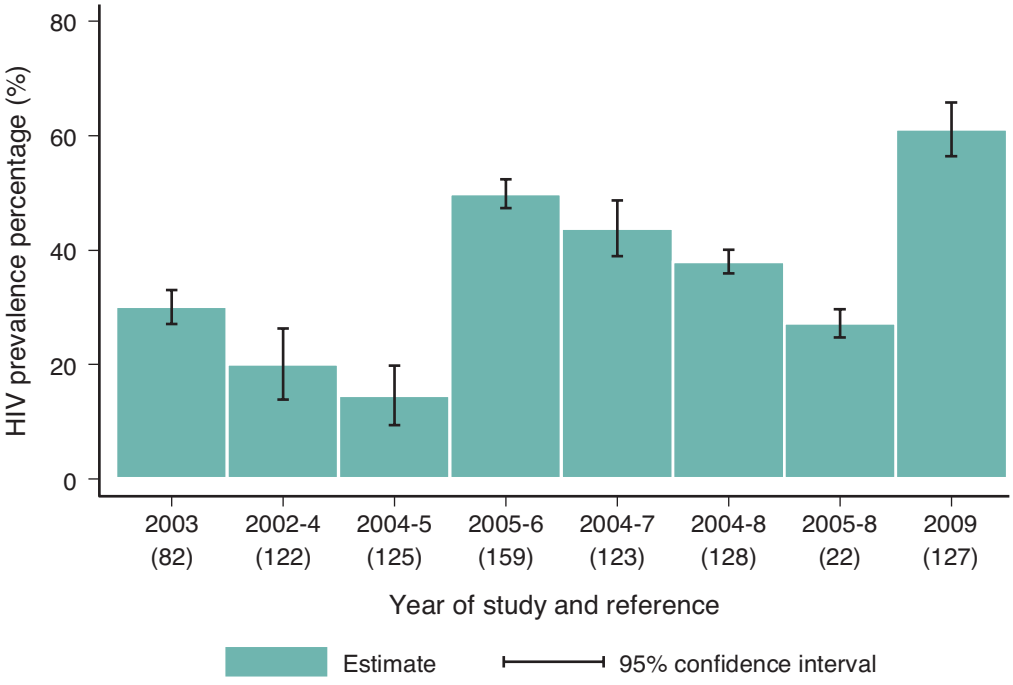
Seven of the studies used in Estonia, Montengegro, Romania, Kyrgystan, the Republic of Moldova, Tajikistan and the Russian Federation employed Respondent Driven Sampling (RDS) to recruit PWID from community settings. [20, 37 – 42] In RDS, sampling begins with a set of initial subjects who serve as seeds for an expanding chain of referrals recruited through dual incentives, one received for participating in the study and subsequent ones for each person you recruit. Respondents from each link in the chain or wave referring respondents form subsequent waves. Information on the relationships between recruiters and recruited and their estimated network size is collected during the interview to allow for the calculation of selection probabilities. [43] This information is used to assess homophily, the extent to which recruiters are likely to recruit individuals similar to themselves, and to weight the sample to compensate or control

for differences in network size, homophily and recruitment success. RDS has been increasingly used in Europe and internationally to recruit samples of sex workers [44 – 45] MSM [46] and PWID [47 – 50] and has been championed for its' ability to provide more representative estimates of risk behaviour and HIV prevalence. [46, 50 – 53] There has been recent ethical concerns that the use of incentives may negatively affecting participants' social and economic relationships in populations of PWID as well as questioning of the assumption that participants can accurately recall detailed information on the composition of their network including size and relationship in order to fulfil the condition of randomly recruiting a participant within their social network. [54 – 56] In addition some evidence shows that RDS is less effective at recruiting populations with small social networks, such as sex workers. [57 – 58]

Case Study 2.1 Estimating HIV prevalence among PWID in St Petersburg, Russian Federation

Saint Petersburg is the Russian Federation's second largest city, with a population of around 4.2 million. Some studies have estimated a three-fold increase in PWID, and a nine-fold increase in teenaged PWID, between 2000 and 2005, and an estimated 70,000 PWID as of 2005. [59] The first case of HIV was reported in 1996, and since there have been multiple estimates suggesting high numbers of cases and high HIV prevalence among PWID. Our review identified eight studies [38, 60 – 66] reporting HIV prevalence among PWID from 2002 to 2009. Even within this one city the estimates vary widely from 30.1% in 2002, down to 14.6% in 2005 and up to 61.1% in 2009. More recent data not collected in the review from St Petersburg (a 2008 – 2010 cohort) suggests that prevalence is around 35%. [37, 67 – 68]

Are these shifts in prevalence a true reflection of trends or is there an alternative explanation? If the samples were truly representative of the population from which they were selected then there is a 95% likelihood that the true population prevalence lies on the black line representing the confidence interval (see below). The larger the study sample, the smaller the confidence intervals represented by the bar and the more accurate the proportion estimated: thus the 2002 [60] and 2004 – 8 [64] estimates are likely to be (statistically) the most precise as their confidence intervals are the narrowest and thus the margin for error the smallest. However, this assumes the representativeness of the population and as with any hidden population with no explicit sampling frame it is impossible to assess the representativeness of the sample. While the studies in 2002, [60, 69] 2004, [61, 70] 2007 [63] and 2009 [71] are limited to those who have injected drugs relatively recently, the 2005 [62] study recruited participants from narcology hospitals, only 40% of whom admitted to ever having injected drugs. Of the remaining four studies, the ones from 2002 and 2007 recruited participants from the community and services as well as through snowball sampling. The 2004 study recruited participants from primary health care centres only and the recruitment procedures used in the 2009 study were not clearly described.

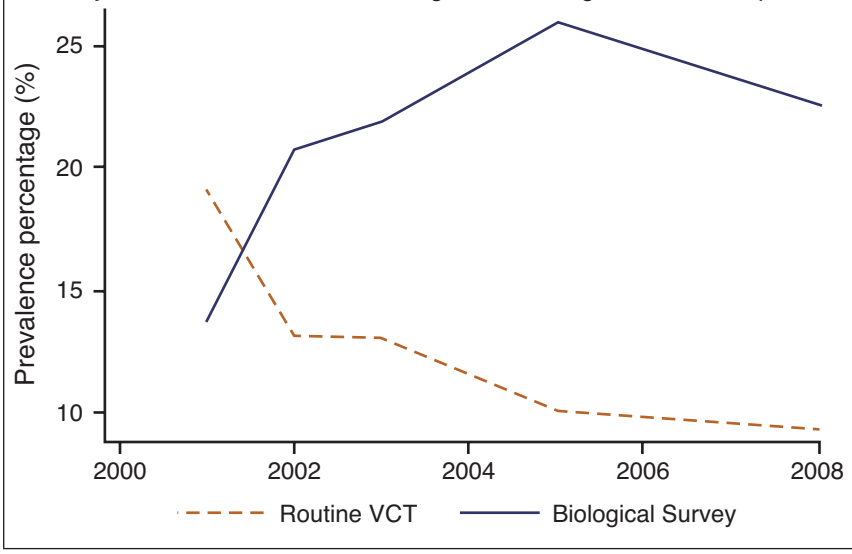


In addition to direct measures of HIV prevalence, at least one behavioural survey had been undertaken among PWID in 37 (74%) countries: half (10) of the countries in the West, 97% (13) of countries in the Centre, and 93% (14) of countries in the East. Thus, in the West and Centre, HIV prevalence

among PWID had been more widely measured than risk behaviour. Obtaining repeated measures of HIV prevalence is critical in concentrated epidemic situations, and such measures were observed in 42 (84%) countries. Two-thirds of countries (33) also had repeated surveys of risk behaviour. As shown in Table 2.2, 44 (88%) counties had studies that allowed monitoring of HIV prevalence, risk behaviours or both among PWID (80% in the West, 93% in both the Centre and the East). Table 2.2 also shows that evidence of monitoring over time was common across all three sub-regions: 75% of the countries in the West, 93% in the Centre and 87% in the East monitored HIV prevalence; 50% of the countries in the West, 62% in the Centre and 93% in the East monitored risk behaviours. An example of a successful biological-behavioural system among PWID used annually in the United Kingdom is summarised as Case study 2.3.

Case Study 2.2 Estimating HIV prevalence among PWID in Riga, Latvia

The UNGASS 2010 Country Report for Latvia [72] reported two sets of prevalence figures provided by the Infectology Centre of Latvia (ICL) among PWID in Riga for the period 2001 – 2008. Both estimates appear to have stabilised by the end of the decade, but the biological survey data shows significantly higher prevalence than the routine VCT. Despite a larger sample size from the routine VCT (mean sample size 644 versus 265) the studies both present feasible estimates of the HIV prevalence in the population. One possible explanation for the differences is that the studies may have recruited participants from different settings that may influence or be influenced by HIV status. Participants recruited through routine VCT may not be current injectors and evidence shows that PWID not in touch with services tend to engage in higher risk injecting behaviours reflected in the higher prevalence of the survey sample. This Figure highlights the heterogeneity in prevalence estimates obtained with different recruitment strategies, emphasising the importance of drawing estimates from multiple different methods, even in relatively small locations, before defining or delineating an estimate of prevalence.



Case Study 2.3 Two decades of Sero-behavioural monitoring of infections among PWID in the United Kingdom.

National sero-behavioural surveillance among PWID in England and Wales was started in 1990. [73] Annually around 3,000 PWID have been recruited through over 50 needle-exchanges and prescribing services. Consenting PWID provide a biological sample and self-complete a behavioural questionnaire.

This survey found that HIV prevalence among PWID fell from 1.8% in 1991 to 0.61% in 1996, it then remained at or below 1% until 2002, before rising to 1.6% in 2005 and prevalence has remained at around that level since then. Trends in hepatitis C (HCV) prevalence showed a similar pattern; falling from 61% in 1992 to 38% in 1999, before rising to 47% in 2009. Reported needle and syringe sharing fell from 24% in 1991 to 17% in 1997, before rising to 34% in 2002 and then declining to 19% in 2009. Uptake of HIV testing was found to have increased in recent years after being relatively stable up to 2003 with around half of PWID ever tested; it then rose to 75% in 2009.

(continued next page)

Case Study 2.3 *(continued)*

These surveillance data have influenced policy and responses, as well as reflecting the impacts of these. For example, reducing the sharing of needles and syringes was a policy target from 1992 to 1997, but in 1998 the policy focus shifted to criminal justice issues. This policy shift coincided with the rise in sharing levels and subsequent rise in prevalence of HIV. In response to increased levels of infections among PWID in 2003 publication of an annual surveillance report on infections among PWID started. [74] The resultant increase in the profile of injection related harm among PWID contributed to the development of Action Plans on HCV and drug related harms. Harm reduction services were improved in response to these, and access to drug treatment made easier. Needle/syringe sharing has recently declined and the prevalence of both HIV and HCV are now stable. [75] Sero-behavioural surveillance has thus been important in both monitoring and informing the development of interventions and policy.

Table 2.2 Number of countries with studies measuring and monitoring HIV and behaviours among PWID, SW and MSM in Europe

Sub-region	Number of countries with a direct measure of prevalence (monitoring*)			Number of countries that measured behaviours (monitoring*)			Number of countries that have measured either behaviours or prevalence (monitoring*)		
	PWID	SW	MSM	PWID	SW	MSM	PWID	SW	MSM
West (n=20)	19 (15)	13 (1)	8 (2†)	10 (10)	8 (7)	15 (12)	19 (16)	13 (7)	16 (12)
Centre (n=15)	15 (14)	11 (4)	13 (7)	13 (9)	9 (2)	13 (5)	15 (14)	11 (4)	13 (7)
East (n=15)	14 (13)	14 (13)	12 (10)	14 (14)	13 (11)	14 (11)	14 (14)	14 (14)	14 (12)
Total	48 (42)	38 (18)	33 (19)	37 (35)	30 (20)	42 (28)	48 (44)	38 (25)	43 (31)

Source: Appendix 2.A.7 – 10.
Notes: * = they have either undertaken a study which has been repeated at regular intervals or undertaken a number of separate studies at different time points which have used comparable methodologies; † = unclear

2.2.2 Sex workers

Three quarters of the countries had undertaken studies to estimate HIV prevalence or risk behaviour among SWs in the period 2000 and 2010 equalling 76% of the 50 countries across Europe. An HIV prevalence study was found in just over half of the countries (13) in the West, two thirds (11) of those in the Centre, and most (14/15) of those in the East. The majority of countries in the East had undertaken either repeated surveys or studies at multiple points in time (13), but only four in the Centre and one in West had done so. The countries with no such published studies included three with populations of less than 1 million (Cyprus, Malta, and Iceland) where undertaking surveys are likely impractical due to small population sizes. The other eight countries without such studies were: Albania; Denmark; Finland; France; Ireland; Slovakia; Sweden; Slovenia; and Turkmenistan. We identified few studies (15) conducted in the last 3 – 5 years among SWs. Of these, most had been conducted in the East, with estimates from Austria, the Netherlands, Portugal, Spain, Czech Republic and Poland dated back to 2000 – 2001.

Of the HIV prevalence studies among SWs identified (101), 38 were selected as 'best estimates'. The characteristics of these studies show that only 8/38 had national coverage. [17 – 18, 32, 76 – 81] As with PWID, these samples were mostly recruited via sexually transmitted infection (STI) clinics such as studies in Austria (1,184), Germany (3,880), Spain (4,485), Kazakhstan (1,960), Russian Federation (4209), and a large community recruited sample in Ukraine (2,278). [3, 32, 77 – 78, 82 – 83] Studies in The former Yugoslav Republic of Macedonia and Armenia described as national samples were limited by small sample

sizes. [3, 18] Recruitment sites for SWs focused on STI clinics, work settings, and outreach projects for MSWs. Community surveys employed a range of methods, including recruiting from sex work venues, for example, street sites were used in Portugal or Romania; [84] gay clubs and bars as used in studies in the United Kingdom, France or Italy [10, 85 – 86] and respondent driven sampling used in the Republic of Moldova and Albania. [44 – 45] As with PWID (see above), recruiting SWs at their places of work and in the community overcomes potential bias linked to recruiting those in contact with STI clinics and helping services. Especially vulnerable SWs, such as migrant SWs, for instance, are less likely to be in contact with clinics. [87 – 89]

An HIV related behavioural survey of SW was identified in three-fifths (30) of the countries: two-fifths (8) of the countries in the Western sub-region had a report of a behavioural survey among SW, three-fifths (9) of those in the Central sub-region, and the majority (13/15) of those in the East. More countries had undertaken either repeated surveys or studies at different point in time that could be used to monitor behaviours in the West (7) and the East (11) than in the Centre (2). So while overall HIV prevalence among SWs had been more widely measured than risk behaviours in all three sub-regions, in the West more countries were monitoring behaviours than HIV prevalence. One example of behavioural monitoring conducted in the region is via 'TAMPEP' the European Network for HIV/STI Prevention and Health Promotion among Migrant Sex Workers who conduct quantitative and qualitative research via sex worker oriented services in 25 European Union member countries every two years. Data are collated on the size of populations as well as the profile of male, female and transgender SWs across the region, documenting increases in violence, problems with the police, changes in the profile of sex workers and the organisation of sex workers. [90] Another example of a successful surveillance system used to measure HIV and related risk behaviours among SWs in Kazakhstan is given below in Case Study 2.4.

Only 6 studies were identified among MSWs, 5 of which were in the West and 1 in the Russian Federation. The studies in the Russian Federation and the Netherlands were limited by small sample sizes. All studies were conducted prior to 2007 and all were at single sites with the exception of Spain where a large national sample was taken from an HIV clinic. All studies collected linked behavioural data.

Case Study 2.4 Sero-behavioural monitoring of infections among SW in the Kazakhstan

In 2009, Kazakhstan has an estimated population size of 16,250 female sex workers in the country. Between 2005 and 2009, annual bio-behavioural surveillance surveys have been implemented among FSWs involving large sample sizes, in 2009 2,249 FSWs were recruited but sample sizes for previous years were not specified. [91] Eligibility criteria were women with a self-reported history of provision of sex work at least once in the past 6 months and women were recruited across multiple sites nationally. [91 – 92] This bio-behavioural surveillance survey collects information to monitor the impact of the responses to HIV (with similar surveys among MSM and PWID) and similar studies are conducted in Kyrgyzstan and Tajikistan.

The findings for the period 2006 to 2009 indicate that the prevalence of HIV among FSWs decreased from 2.5% to 1.3%, the prevalence of HCV from 17% to 11%, and the prevalence of syphilis from 26% to 18%. During this period, the self-reported coverage of FSWs with HIV prevention activities consistently increased from 51% in 2006 to 88% in 2009; with 90% of the participants reporting receiving free condoms in 2009. Over three-quarters (76%) of the participants reported having had a voluntary HIV test in the past 12 months in 2009.

These changes probably reflect the on-going investment in prevention services, including provision of condoms, information and advice, and syndromic STI management. [92] For example, in 2009, 5,090,026 condoms were distributed among sex workers in Kazakhstan, or 313 condoms per sex worker. Continued surveillance will allow the on-going assessment of the situation and monitoring of intervention impact. Both the surveillance system and programmes are supported through funding via the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM). Since funding for this has been cut in 2011, the future of these projects are uncertain.

2.2.3 Men who have sex with men

The majority (43, 86%) of the 50 countries in region had publications reporting on a study related to HIV or behaviours among MSM undertaken between 2000 and 2010. The countries with no published stud-

ies of either directly measured HIV prevalence or behaviours among MSM were: Austria; Cyprus; Malta; Luxembourg; Iceland; Montenegro; and Turkmenistan.

Of the identified HIV prevalence studies among MSM (67), 33 were selected as 'best estimates'. Proportionally fewer countries in the West (8/20) had assessed HIV prevalence among MSM, compared to the Centre (13/15) and Eastern (12/15) sub-regions. Very few countries in the West (2) had undertaken either repeated surveys or studies at different points in time that could be used to monitor prevalence, while seven countries had done this in the Centre and 10 in the East. The majority of studies (27) been conducted within the last 3 years with the exception of Netherlands, Portugal, Spain, Switzerland, Poland and Croatia where studies were conducted between 2000 and 2006.

The characteristics of these studies showed that only 9/33 had national coverage. [3, 16 – 18, 22, 25, 93 – 94], only three had a sample size greater than 1000 (the Netherlands, Spain and Switzerland). [3] A large sample had been recruited from 5 cities in the United Kingdom as well as the Russian Federation. [79, 95 – 96] Clinic based recruitment centred around STI clinics and HIV testing centres [3, 17, 97] and one community health service. [35] Unlike, PWID and SWs, the majority of samples were recruited from community settings. [16, 18, 21 – 22, 24, 36, 79, 95 – 96, 98 – 105]

Recruitment from community settings used Time Location Sampling (TLS) in Italy, Czech Republic, Slovakia and Slovenia and RDS in Albania, Croatia, Georgia and Kyrgyzstan. [16, 96, 99, 102 – 104, 106] TLS works by conducting extensive mapping of venues where the research population congregates, randomly selecting venues to recruit from, then systematically recruiting participants from those venues. [27] Evidence from this review shows that TLS was possible in cities with well-developed gay scenes such as Barcelona, Verona and London and with cities with fewer gay venues and less liberal attitudes to MSM in Bratislava, Ljublijana and Bucharest. [96, 102]

Across the whole region behavioural surveys had been more extensively undertaken than prevalence studies, with published studies originating from 42 countries or 84% of the region. This is particularly so in the West where three-quarters (15) of the countries in the Western sub-region had a assessed behaviours among MSM, as had the majority of countries in the Centre (13/15) and East (14/15). Approximately two-thirds of countries had evidence to indicate that they could monitor HIV related behaviours among MSM through either repeated surveys or studies undertaken at different points in time.

One example of a successful behavioural survey of MSM in the West, is the European MSM Internet Sex survey (EMIS). [107] The survey collected data from MSM in 38 countries and was advertised on a range of 'Gay' orientated internet sites, mainly ones where MSM meet sexual partners, and through community organisations. Data from internet surveys needs to be interpreted with caution as the sample is self-selecting, as a result the representativeness of such samples is unclear and this is also likely to differ between countries and possibly over time (e.g., due to varying and evolving patterns in internet access and use). However, the EMIS survey has the potential to provide broadly comparable data on behaviours among MSM across much of the region. Repeating EMIS on an annual basis would provide a European wide behavioural surveillance system for MSM that complemented the existing national systems.

Limitations of this assessment

Public health surveillance studies typically use pragmatic approaches to ensure efficient use of the available resources, to allow data to be collected and made available relatively quickly, and to ensure their sustainability over time. Thus, these studies have to balance robustness (i.e., representativeness and geographic coverage) against efficient use of resources, timeliness, and sustainability as well as considering the population context. This need for a pragmatic approach often leads to studies that use sentinel sites and accessible sub-groups of the population to produce data that can produce nationally

useful insights when combined with other available data (e.g., HIV case reports, data on HIV testing, service usage data [NSP, OST, STI testing, etc.], estimates of population size, etc.). However there are problems with taking national estimates of HIV prevalence in countries with varying prevalence of HIV at a city level needs, this point is illustrated in Case Study 2.5. Our review focussed on synthesising data from published studies and so we identify estimates from both public health surveillance activities as well as from studies using more sophisticated epidemiological research designs. As a consequence, data on prevalence and behaviours are not always comparable either between or within countries. This analysis is further limited since information on the methodologies used in the studies was often not provided in full making it difficult to systematically assess quality.

Case Study 2.5 Estimating HIV prevalence in Kyrgyzstan and Tajikistan

This case study illustrates the diversity of HIV prevalence estimates generated within a country or region, especially in a context of rapidly evolving localised epidemics, accentuating the limits of relying upon composite national estimates of HIV prevalence when assessing programmatic needs and responses.

Kyrgyzstan: Annual sentinel surveillance of HIV prevalence among PWID is carried out in Kyrgyzstan. HIV prevalence among PWID was estimated to be 7.7% in 2007, declining to 6.8% in 2008 and increasing to 14.3% in 2009. However, by examining the surveillance methods more closely we can see that the apparent decline in 2008 was an artefact of the methodology and the inclusion or exclusion of certain sites. Initially only Bishkek and Osh were included in the survey but in 2007 the sample increased to include Jalal-Abad, Batken and Chui. In 2008 however, Osh was not included. The HIV prevalence among PWID in Osh is high, reported as 12% as early as 2004, increasing to 14% in 2005 and 2006 and decreasing back down to 12.9% in 2007. By excluding Osh in the 2008 survey the results for that year are artificially lowered.

Tajikistan: Sentinel surveillance of HIV among PWID has been in place in Tajikistan since 2005, although studies in the capital, Dushanbe, from 2004 indicate that prevalence there was 12.1%. National reported prevalence among PWID was 15.8% in 2005, increasing to 23.5% in 2006 and then decreasing to 19.4% in 2007, 17.6% in 2008 and 17.3% in 2009. Similar to Kyrgyzstan, the number of sites included in the surveillance has changed several times over the time period, starting in 2007 with the inclusion of four high-very high prevalence cities in the survey causing the national prevalence to increase. In 2009 an additional two cities, this time with medium level HIV prevalence were included which led to the appearance of a reduced national prevalence among PWID.

The diversity of HIV epidemics between cities, even in relatively small countries such as Kyrgyzstan and Tajikistan, highlight the unsuitability of using a composite national prevalence in describing the HIV epidemic among PWID in many settings.

2.2.4 Measurement of HIV incidence among high risk groups

Incidence, the rate at which new infections occur in a population, can be directly measured using two approaches. The most established approach is to follow-up a group of people at risk over time. However such studies are costly to undertake and with marginalised populations it can be particularly difficult to get a representative sample and keep track of them over time. Retrospective cohorts can also be constructed through use of case-note reviews and record linkage, but are affected by similar biases. More recently it has been possible to measure HIV incidence using a laboratory test that assesses whether a HIV infection is recent (STARHS [Serological Testing Algorithm for Recent HIV Sero-conversion] or RITA [Recent Infection Testing Algorithm]). It is also possible to indirectly estimate incidence from HIV prevalence data using a number of approaches including force of infection modelling [108 – 109] and measuring prevalence among people who have recently started injecting assuming that that they would not have been infected via another route. [57, 110] An example where this approach has been used is described in Case Study 2.6. Incidence can also be estimated through back-calculation approaches using data on HIV diagnoses, clinical status at diagnosis and AIDS. [111] Here the literature review was used to explore whether countries had reported incidence among PWID, MSM and sex workers since 2000 from either a cohort study or the application of the RITA test.

There were only a few countries where studies had been undertaken to directly measure HIV incidence since 2000. The literature review indicated that among PWID incidence had been directly measured in five countries: Ireland (retrospective cohort, case note), [112] Netherlands (prospective cohort), [113] Russian Federation (prospective cohort), [37] Spain (retrospective cohort, record linkage), [114] and the United Kingdom (prospective cohort) [115]. There were three countries with published incidences among MSM; Italy (retrospective cohort, case note) , Netherlands (prospective cohort), [117] and the United

Kingdom (STARHS/RITA). [118] There were also [116] two counties with papers reporting direct incidence measures among MSWs: Russian Federation (prospective cohort) [119] and the United Kingdom (retrospective cohort, case note). [120]

Case Study 2.6 Using Bio-behavioural surveys to measure HIV incidence among PWID in Estonia

Serial cross-sectional studies of PWID were conducted in Tallinn, Estonia in 2005 (n=350), 2007 (n=35) and 2009 (n=327). [39, 110] Eligibility criteria were defined as injecting in the last four weeks (2005) and last two months (2007 and 2009). Recruitment took place in community settings using respondent-driven sampling (RDS). Biological data were collected using dried blood spots (2005) and whole serum samples in the other two years. Comparable measures of injecting risk behaviours and access to services were collected in all three years although a different questionnaire was used in 2005. Results of the surveys suggest that HIV prevalence among the samples was consistently high at 54% in 2005, 55% in 2007 and 50% in 2009. HIV incidence was calculated among recent initiates into injected (defined as those injecting for three years or less) and estimated assuming new injectors were HIV negative when they began injecting and that sero-conversion took place at the midpoint between first injection and recruitment into the study. [110] HIV incidence per 100 person years was 20.9 (95% CI 13.5020.8) in 2005, 26.5 (95% CI 16.6 – 40.1) in 2007 and 9 (95% CI 3.3 – 19.6) in 2009.

Behavioural data suggested that demographic characteristics of new injectors remained the same over time with the exception of age and proportionally more new injectors in 2009 were older than 20 years than in 2005. Use HIV prevention services changed and proportionally more new injectors reported ever using a NSP (70% in 2005 and 97% in 2009) and that the NSP was their main source of new needles/syringes (44% in 2005 and 76% in 2009). There was no difference in the proportion reporting receptive sharing of daily injecting over the years. These observed changes in incidence coincided with increase in the number of needles/syringes distributed in Tallinn over time with 3 times the number distributed in 2009 than in 2005 and 43 times greater compared to 2003. Increases in condom distribution have also been observed as well as the introduction of opiate substitution therapy. This example shows how the use of serial cross-sectional surveys can be useful to inform the evaluation of HIV prevention services as well as give a measure of HIV incidence.

2.2.5 Measuring population sizes for MSM, PWID and SW

Knowing the size of population at risk is important for planning HIV prevention and care services as well as measuring the harms associated with the population or risk behaviour. [121 – 122] Without a denominator it is difficult to know whether HIV prevalence at a general population level is increasing and/or whether the size of the population group is increasing. While almost all countries have robust data on the size of their overall population, measurement of the size of high risk groups is not a routine demographic activity in part due the associated challenges.

Due to the illicit and marginalised nature of injecting drug use and sex work, and common discrimination against MSM, the sizes of these groups are difficult to estimate. In the case of sex workers, estimation problems are further complicated by the mobile nature of the group. Estimates of the population sizes of these groups typically use indirect estimation approaches such as capture-recapture and multiplier methods. A number of countries have looked at measuring the extent of same sex behaviours through household surveys; however, the robustness of this measure is unclear. [122] We identified most recent published estimates for the three main risk groups, presenting the year the estimates were given. Estimates of PWID and sex workers typically relate to individuals who are either currently or have recently injected drugs or sold sex (e.g., injected in last month, or sold sex in last year). Estimates of MSM may relate to sexual behaviour, (e.g., had sex with another man in last five years), or identity (e.g., identify as gay or bisexual). As many of the estimates identified were derived from secondary sources or lacked methodological details the findings should be interpreted with caution and we focus on documenting whether recent estimate was available rather than commenting on the plausibility of the estimate or the robustness of the method used to obtain it—there is however likely to be considerable variability in the quality and comparability of the estimates.

Overall 43 (86%) countries had published estimates of the size of their PWID populations, with 37 of these estimates relating to 2000 or later (Table 2.3). Since 2000, 55% of countries in the West (85% if pre-2000 estimates are included) had estimated the sizes of their PWID populations, with 87% of the countries in both the Centre and the East having also done so. Overall 5 (10%) countries had published

estimates of the size of their MSM populations (none of the countries in the West, 7% in Centre and 27% in the East); while 43 (86%) countries had done so for SW (75% of countries in the West, 87% in Centre and all the countries in the East).

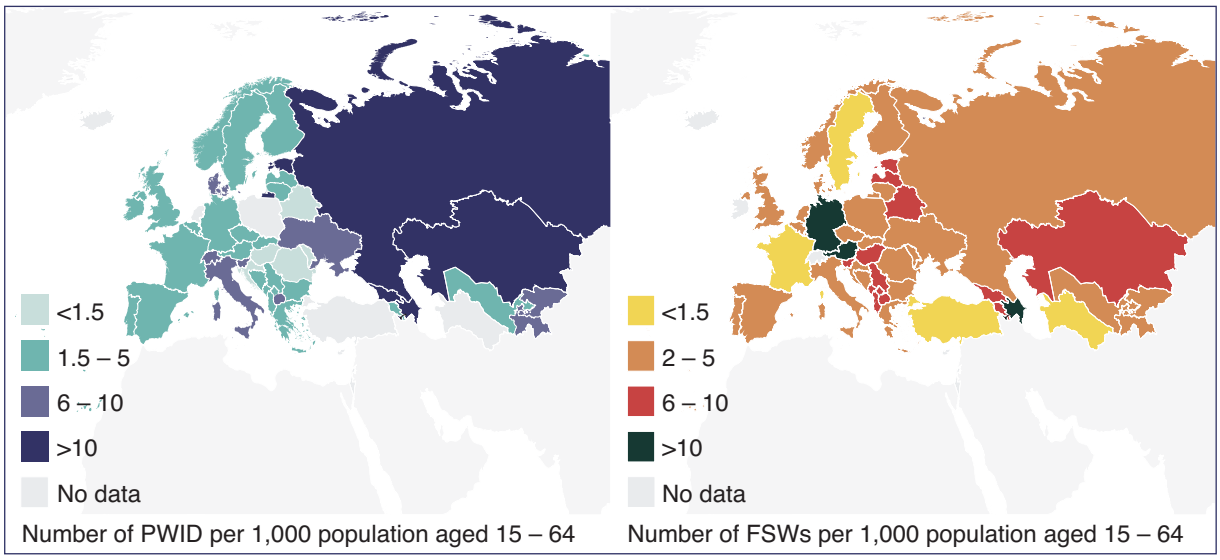
Table 2.3 Number of countries estimates of population sizes of PWID, SW and MSMs

Sub-region	Number of countries with PWID estimates	Number of countries with MSM estimates	Number of countries with FSW estimates
West (n=20)	11 (plus 6 pre-2000)	0	15
Centre (n=15)	13 (year unclear for 4)	1	13
East (n=15)	13	4	15

Source: Literature Review. See Appendix Table 2.A.11.
Note: n = sample size

Estimate of the size of PWID population suggest that the largest populations are in the East, particularly in the Russian Federation, Baltic states and Central Asian Republics, corresponding to high HIV prevalence in that region. The pattern is slightly different for FSWs, larger population sizes of FSWs have been recorded in the Centre, particularly in Germany, Austria and Luxembourg (>10 per 1000 population (Figure 2.21).

Figure 2.21 Size of PWID and SW populations per 1000 population aged 15 – 44 years



Sources: EMCDDA Statistical Bulletin 2011; Mathers et al, 2008; Albania Global Fund Round 5 proposal; Bosnia/ Herzegovina UNICEF 2009; Macedonia IIEP 2008; IPH of Serbia 2008; The Government of Kazakhstan 2010; APMG 2009; Vandepitte et al; TAMPEP; Bosnia/ Herzegovina, Azerbaijan & Belarus Global Fund proposals.
Note: FSW = female sex worker; PWID = people who inject drugs.

References

[1] European Centre for Disease Prevention and Control/WHO Regional Office for Europe, HIV/AIDS surveillance in Europe 2009, 2010, *European Centre for Disease Prevention and Control: Stockholm*.

[2] European Centre for Disease Prevention and Control (ECDC), Mapping of HIV/STI behavioural surveillance in Europe, in *ECDC TECHNICAL REPORT* 2009: Stockholm.

[3] EuroHIV, HIV/AIDS Surveillance in Europe. End of year report 2005., 2006, *Institut de veille sanitaire: Saint-Maurice*.

[4] Department of Health and Social Development of Russian Federation, et al., *HIV INFECTION* Newsletter № 34, 2010: Moscow

[5] Mocroft, A., et al., Decline in the AIDS and death rates in the EuroSIDA study: an observational study. *The Lancet,* 2003. 362(9377): p. 22 – 29.

[6] Stengaard, A.R., et al., Access to highly active antiretroviral therapy (HAART) for women and children in the WHO European Region 2002 – 2006. *AIDS Care,* 2009. 21(7): p. 893 – 902.

[7] Del Amo, J., et al., The epidemiology of HIV and AIDS reports in migrants in the 27 European Union countries, Norway and Iceland: 1999 – 2006. *European Journal of Public Health*, 2011. 21(5): p. 620 – 6.

[8] Deblonde, J., et al., Barriers to HIV testing in Europe: a systematic review. *European Journal of Public Health*, 2010. 20(4): p. 422 – 32.

[9] Khotenashvili, L., S. Matic, and J.V. Lazarus, HIV testing and counselling policies and practices in Europe: lessons learned, ways forward. *HIV Medicine,* 2008. 9: p. 30 – 33.

[10] European Centre for Disease Prevention and Control, Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report, 2010, *ECDC*: Stockholm.

[11] European Centre for Disease Prevention and Control/WHO Regional Office for Europe, HIV/AIDS surveillance in Europe 2010, 2011, *European Centre for Disease Prevention and Control: Stockholm*.

[12] Deblonde, J., et al., HIV testing in Europe: mapping policies. *Health Policy*, 2011. 103(2 – 3): p. 101 – 10.

[13] UNAIDS/WHO, Guidelines for Second Generation HIV Surveillance: *The Next Decade*, 2000: Geneva, Switzerland. p. 48.

[14] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). *Statistical bulletin 2011*. 2011; Available from: http://www.emcdda.europa.eu/stats11.

[15] Loebstein, R., Mahagna, R, Maor, Y, Kurnik, D, Elbaz, E, Halkin, H, Olchovsky, D, Ezra, D, Almog, S., Hepatitis C, B, and Human Immunodeficiency Virus Infections in Illicit Drug Users in Israel: *Prevalence and Risk Factors*. Vol. 10. 2008, Ramat Gan, ISRAEL: Israel Medical Association. 4.

[16] ICON Institute for Public Health, Operational Research on key STIs and HIV in Turkey, 2007: Ankara.

[17] UNGASS, Country Progress Report on Monitoring the Declaration of Committment on HIV/AIDS: Republic of Bulgaria, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[18] UNGASS, UNGASS Country Progress Report: Republic of Macedonia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[19] Inogamov, Z., I., State of the HIV epidemic in the Republic of Uzbekistan Results of the SS in 2007: The results of sentinel surveillance of HIV infection among injecting drug users in 14 sentinel sites of the Republic of Uzbekistan, 2007., 2008: Tashkent.

[20] Soliev, A., Analysis on epidemiological situation and responses based on second generation sentinel surveillance system among injecting drug users, Tajikistan, Kazakhstan, Kyrgyzstan, 2006 – 2009, 2010.

[21] UNGASS, UNGASS Belarus 2010 Country Progress Report. 2010.

[22] UNGASS, National Report on Monitoring Progress Towards the UNGASS Declaration of Commitment on HIV/AIDS: Ukraine, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Kyiv.

[23] UNGASS, UNGASS Country Progress Report: Georgia, 2010.

[24] UNGASS, UNGASS Country Progress Report: Republic of Serbia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[25] UNGASS, Republic of Belarus: National Report on the Implementation of the Declaration of Committment on HIV/AIDS., United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Minsk.

[26] UNICEF, Biological and Behavioural Survey among Injection Drug Users, Bosnia and Herzegovina, 2007, UNICEF Bosnia and Herzegovina.

[27] Semaan, S., J. Lauby, and J. Liebman, Street and network sampling in evaluation studies of HIV risk-reduction interventions. *AIDS Reviews,* 2002. 4: p. 231 – 223.

[28] Des Jarlais, D.C., Dehne K, and J. Casbona, HIV Surveillance among injecting drug users. *AIDS,* 2001. 14(suppl 3): p. S13 – S22.

[29] Diaz, T., et al., Factors associated with prevalent hepatitis C: differences among young adult injection drug users in lower and upper Manhattan, New York City. *American Journal of Public Health,* 2001. 91(1): p. 23 – 30.

[30] Griffiths, P., et al., Researching hidden populations of drug users by privileged access interviewers: methodological and practical issues. *Addiction,* 1993. 88: p. 1617 – 1626.

[31] Kuebler, D., D. Hausser, and J.-P. Gervasoni, The characteristics of 'new users' of cocaine and heroin unknown to treatment agencies: results from the Swiss Hidden Population Study. *Addiction,* 2000. 95(10): p. 1561 – 1571.

[32] Rhodes, T., et al., Prevalence of HIV, hepatitis C and syphilis among injecting drug users in Russia: a multi-city study. *Addiction,* 2006. 101(2): p. 252 – 266.

[33] Watters, J.K. and P. Biernacki, Targeted sampling: options for the study of hidden populations. *Social Problems,* 1989. 46: p. 416 – 430.

[34] UNGASS Country Progress Report 2010: Sweden, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[35] UNGASS, UNGASS Country Progress Report: Estonia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[36] UNGASS, UNGASS Country Progress Report: Azerbaijan. 2010.

[37] Kozlov, A.P., et al., HIV incidence and factors associated with HIV acquisition among injection drug users in St Petersburg, Russia. *AIDS,* 2006. 20(6): p. 901 – 906 10.1097/01.aids.0000218555.36661.9c.

[38] Niccolai, L.M., et al., High HIV Prevalence, Suboptimal HIV Testing, and Low Knowledge of HIV-Positive Serostatus Among Injection Drug Users in St. Petersburg, Russia. *AIDS and Behavior,* 2010. 14(4): p. 932 – 941.

[39] Platt, L., et al., High HIV prevalence among injecting drug users in Estonia: implications for understanding the risk environment. *AIDS,* 2006. 20(16): p. 2120 – 2123 10.1097/01.aids.0000247586.23696.20.

[40] UNGASS, UNGASS Country Progress Report: Montenegro, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[41] UNGASS, UNGASS country report 2010: Tajikistan. 2010.

[42] United Nations Office on Drugs and Crime (UNODC), HIV, HBV and HCV Behavioral Surveillance Survey among Injecting Drug Users in Bucharest, Romania, 2010: Bucharest.

[43] Heckathorn, D.D., et al., Extensions of Respondent Driven Sampling: A new approach to the study of injection drug users aged 18 – 25. *AIDS and Behaviour,* 2002. 6(1): p. 55 – 67.

[44] Qyra, S.T., et al., Behavioral risk factors and prevalence of HIV and other STIs among female sex workers in Tirana, Albania. *New Microbiologica*, 2011. 34(1): p. 105 – 8.

[45] UNGASS, UNGASS Country Progress Report: Republic of Moldova, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Chisinau.

[46] Johnston, L.G., et al., The effectiveness of respondent driven sampling for recruiting males who have sex with males in Dhaka, Bangladesh. *AIDS and Behavior* 2008. 12(2): p. 294 – 304.

[47] Wang, J., et al., Respondent-driven sampling to recruit MDMA users: a methodological assessment. *Drug and Alcohol Dependence,* 2005. 78: p. 147 – 157.

[48] Judd, A., et al., Improving survey methods in sero-epidemiological studies of injecting drug users: a case example of two cross sectional surveys in Serbia and Montenegro. *BMC Infectious Diseases,* 2009. 9: p. 14.

[49] McKnight, C., et al., Respondent-Driven Sampling in a Study of Drug Users in New York City: Notes from the Field. *Journal of Urban Health,* 2006.

[50] Abdul-Quader, A.S., et al., Effectiveness of respondent-driven sampling for recruiting drug users in New York City: findings from a pilot study. *Journal of Urban Health,* 2006. 83(3): p. 459 – 76.

[51] Goel, S. and M.J. Salganik, Assessing respondent-driven sampling. Proceedings of the Natl Acad Sciences U S A, 2010. 107(15): p. 6743 – 7.

[52] Ramirez-Valles, J., et al., From Networks to Populations: The Development and Application of Respondent-Driven Sampling Among IDUs and Latino Gay Men. *AIDS and Behaviour,* 2005. 9(4): p. 387 – 402.

[53] Salganik, M., J. and D.D. Heckathorn, Sampling and estimation in hidden populations using respondent-driven sampling. *Sociological Methodology,* 2004: p. 1 – 28.

[54] Heimer, R., Critical issues and further questions about respondent-driven sampling: comment on Ramirez-Valles, et al. (2005). *AIDS and Behaviour,* 2005. 9(4): p. 403 – 8; discussion 409 – 13.

[55] Platt, L., et al., Methodologies to recruit hard-to-reach groups in Russia and Estonia: Comparisons of two chain referral sampling methods across nine studies *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2006. 83(7): p. i39 – i53.

[56] Scott, G., "They got their program, and I got mine": a cautionary tale concerning the ethical implications of using respondent-driven sampling to study injection drug users. I*nternational Journal of Drug Policy,* 2008. 19(1): p. 42 – 51.

[57] Platt, L., et al., Changes in HIV prevalence and risk among new injecting drug users in a Russian city of high HIV prevalence. *Journal of Acquired Immune Deficiency Syndrome*, 2008. 47(5): p. 623 – 631.

[58] Simic, M., et al., Attempting respondent driven sampling in sex worker populations in Eastern Europe: emerging evidence and key issues for formative research. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2006.

[59] Ostrovski, D.V. WHO drug injecting study in St. Petersburg. Phase two. in 14th World AIDS Conference. 2002. Barcelona.

[60] Shaboltas, A.V., et al., HIV Prevalence, Sociodemographic, and Behavioral Correlates and Recruitment Methods Among Injection Drug Users in St. Petersburg, Russia. *Journal of Acquired Immune Deficiency Syndromes,* 2006. 41(5): p. 657 – 663 10.1097/01.qai.0000220166.56866.22.

[61] Abdala, N., et al., *Sexually Transmitted Infections,* Sexual Risk Behaviors and the Risk of Heterosexual Spread of HIV among and beyond IDUs in St. Petersburg, Russia. *European Addiction Research,* 2008. 14(1): p. 19 – 25.

[62] Raj, A., et al., Correlates of Any Condom Use Among Russian Narcology Patients Reporting Recent Unprotected Sex. *AIDS and Behavior,* 2008. 13(2): p. 310 – 317.

[63] Gyarmathy, V.A., et al., Correlates of Unsafe Equipment Sharing among Injecting Drug Users in St. Petersburg, Russia. *European Addiction Research,* 2009. 15(3): p. 163 – 170.

[64] Gyarmathy, V.A., et al., Unprotected Sex in Heterosexual Partnerships of Injecting Drug Users in St. Petersburg, Russia. *AIDS and Behavior,* 2011. 15(1): p. 58 – 64.

[65] Abdala N., W.E., Toussova O.V., Krasnoselskikh T.V., Verevochkin S., Kozlov A.P., Heimer R., Comparing sexual risks and patterns of alcohol and drug use between injection drug users (IDUs) and non-IDUs who report sexual partnerships with IDUs in St. Petersburg, Russia. *BMC Public Health,* 2010. 10(pp 676).

[66] Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being Ministry of Health and Social Development of the Russian Federation, Country Progress Report of the Russian Federation on the Implementation of the Declaration of Commitment on HIV/AIDS, 2010: Moscow.

[67] Verevochkin, S., Shaboltas, A., Skochilov, R., Krasnoselskih, T. , Toussova, O., Malov, S. , Kozlov, A., Different approaches confirm high level of prevalence and incidence rate of HIV infection among IDUs in St. Petersburg, Russia, in XVIII International AIDS Conference2010: Vienna, Austria.

[68] Degenhardt, L., W. Hall, and M. Warner-Smith, Using cohort studies to estimate mortality among injecting drug users that is not attributable to AIDS. Sexually Transmitted Infections, 2006. 82(suppl 3): p. iii56 – iii63.

[69] Shapatava E, N.K., Tsertsvadze T, del Rio C., Risk behaviors and HIV, hepatitis B, and hepatitis C seroprevalence among injection drug users in Georgia. *Drug and Alcohol Dependenc*e, 2006. 82: p. S35 – S38.

[70] Stvilia, K., et al., Prevalence of Hepatitis C, HIV, and Risk Behaviors for Blood-Borne Infections: A Population-Based Survey of the Adult Population of T'bilisi, Republic of Georgia. *Journal of Urban Health,* 2006. 83(2): p. 289 – 298.

[71] Russian Federation Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being, Country Report of the Russian Federation on the Implentation of the Declaration of Committment on HIV/AIDS, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Moscow.

[72] UNGASS, UNGASS Country Progress Report Latvia, 2010.

[73] Public Health England, London. Unlinked Anonymous survey of Injecting Drug Users (IDUs).

[74] Public Health England, H.P.S., National Public Health Service for Wales, CDSC Northern Ireland, and the CRDHB., Shooting Up: Infections among injecting drug users in the United Kingdom 2007., 2008, *Public Health England*: London.

[75] Shooting up: infections among injecting drug users in the United Kingdom 2010. An update, November 2011, in Shooting up: infections among injecting drug users in the United Kingdom, 2011.

[76] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2006, in HIV/AIDS Surveillance in Europe, EuroHIV, Editor 2007, *French Institute for Public Health Surveillance*: Saint-Maurice.

[77] Nielsen, S., et al., STI rates and risk factors among female sex workers attending STI testing sites in Germany, in International *Society for Sexually Transmitted Disease Research,* 2011: Quebec.

[78] Smolskaya, T.T., Yakovleva, A.A., Kasumov, V.K., Gheorgitsa, S.I. , HIV Sentinel Surveillance in High-Risk Groups in Azerbaijan, Republic of Moldova and in the Russian Federation, 2004, World Health Organisation (WHO), Europe.

[79] UNGASS, UNGASS 2008 Country Progress Report: Russian Federation. 2008.

[80] van Veen, M.G., et al., HIV and Sexual Risk Behavior among Commercial Sex Workers in the Netherlands. *Archives of Sexual Behavior,* 2010. 39(3): p. 714 – 723.

[81] Family Health International (FHI), I., Stellit, Behavioural Moniroting Survey Russia 2005, 2007.

[82] Belza, M.J., Prevalence of HIV, HTLV-I and HTLV-II among female sex workers in Spain, 2000 – 2001. *European Journal of Epidemiology*, 2004. 19(3): p. 279 – 82.

[83] Gutierrez, M., et al., Prevalence of HIV-1 non-B subtypes, syphilis, HTLV, and hepatitis B and C viruses among immigrant sex workers in Madrid, Spain. *Journal of Medical Virology,* 2004. 74(4): p. 521 – 7.

[84] Day, S. and H. Ward, Approaching health through the prism of stigma: research in seven European countries, in Sex work, mobility and health in Europe, H.W.S. Day, Editor 2004, Kegan Paul: London.

[85] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe. *Sexually Transmitted Infections,* 2011.

[86] Spizzichino, L., et al., HIV infection among immigrant sex workers in Rome: comparing men, women and transgenders in XVII International AIDS Conference 2008: Mexico city, Mexico.

[87] Gushulak, B.D. and D.W. Macpherson, The basic principles of migration health: Population mobility and gaps in disease prevalence. *Emerging Themes in Epidemiology*, 2006. 3: p. 3.

[88] Soskolne, V. and R.A. Shtarkshall, Migration and HIV prevention programmes: linking structural factors, culture, and individual behaviour—an Israeli experience. *Social Science & Medicine,* 2002. 55(8): p. 1297 – 1307.

[89] Day, S. and H. Ward, Approaching health through the prism of stigma: research in seven European countries, in Sex work, mobility and health in Europe, H.W.S. Day, Editor 2006, Kegan Paul: London.

[90] Tampep and L. Brussa, Sex Work In Europe: A mapping of the prostitution scene in 25 countries, in Sex Work, Migration and Health, T. International, Editor 2009, Tampep International: Amsterdam.

[91] Ongoeva, D., HIV-infection epidemiolgical analysis among sex workers in Central Asia, 2010: Oblast AIDS Centre, Kyrgystan.

[92] Country Coordination Committee, R.o.K., UNGASS 2010 Country Progress Report, Republic of Kazakhstan, 2010: Almaty.

[93] Ibisevic, S., Presentation of results from Bio-behavioral survey among injecting drug users in Sarajevo, Bosnia and Herzegovina, in International Harm Reduction Conference 2009: Bangkok.

[94] UNGASS, UNGASS 2010 Country Progress Report: Uzbekistan. 2010.

[95] Country Report of the Russian Federation on the Implentation of the Declaration of Committment on HIV/AIDS, United Nations General Assembly Special Session on HIV/AIDS, Editor 2008.

[96] Williamson, L.M., et al., Sexual risk behaviour and knowledge of HIV status among community samples of gay men in the United Kingdom. *AIDS,* 2008. 22(9): p. 1063 – 70.

[97] UNGASS, UNGASS 2010 Country Report: Kazakhstan. 2010.

[98] Berghe, W.v., et al., A venue-based HIV prevalence and behavioural study among men who have sex with men in Antwerp and Ghent, Flanders, Belgium, October 2009 to March 2010. *Eurosurveillance*, 2011. 16(28): p. 19914.

[99] Bozicevic, I., et al., Prevalence of sexually transmitted infections among men who have sex with men in Zagreb, Croatia. *AIDS and Behavior,* 2009. 13(2): p. 303 – 309.

[100] Ismailova, A., Epidemiological surveillance of HIV infection in Kyrgyz Republic. 2009.

[101] Izdebski, Z., Research on men who have sex with men, 2004, *TNS OBOP for National AIDS Centre: Warsaw.*

[102] Mirandola, M., et al., HIV bio-behavioural survey among men who have sex with men in Barcelona, Bratislava, Bucharest, Ljubljana, Prague and Verona, 2008 – 2009. (Special Issue: HIV/AIDS and other sexually transmitted infections [STI] in men who have sex with men [MSM]—trends and behavioural surveillance.). *Eurosurveillance*, 2009. 14(48): p. 19427.

[103] Sharra, E. and R. Bani, An analysis of HIV-related risk behaviors of Men Having Sex with Men (MSM), using respondent driven sampling (RDS), in Albania. Archives: *The International Journal of Medicine*, 2009. 2(2): p. 231 – 234.

[104] USAID, USAID IDUs Georgia Tbiliis 2007. 2008.

[105] Velter, A., et al., HIV prevalence and HIV testing behaviour among men who attend commercial gay venues in Paris (France), PREVAGAY 2009 Survey. (Numero thematique—L'infection a VIH-side en France 2009: depistage, nouveaus diagnostics et incidence.) [French]. *Bulletin Epidemiologique Hebdomadaire*, 2010. 45(46): p. 464 – 467.

[106] Ismailova, A., HIV-Infection situation analysis among MSM in Central Asia, 2010: Almaty.

[107] European Men's Internet Survey (EMIS). www.emis-project.eu.

[108] Platt, L., et al., Measuring risk of HIV and HCV among injecting drug users in the Russian Federation. *The European Journal of Public Health,* 2009. 19(4): p. 428 – 433.

[109] Sutton, A.J., et al., A comparison between the force of infection estimates for blood-borne viruses in injecting drug user populations across the European Union: a modelling study. *Journal of Viral Hepatitis*, 2008. 15(11): p. 809 – 816.

[110] Uuskula, A., et al., Expanded syringe exchange programs and reduced HIV infection among new injection drug users in Tallinn, Estonia. *BMJ, Public Health*, 2011. 11.

[111] Downs, A.M., et al., Back-calculation by birth cohort, incorporating age—specific disease progression, pre-AIDS mortality and change in European AIDS case definition. European Union Concerted Action on Multinational AIDS Scenarios. *AIDS,* 2000. 14(14): p. 2179 – 89.

[112] Grogan, L., et al., Bloodborne virus infections among drug users in Ireland: a retrospective cross-sectional survey of screening, prevalence, incidence and hepatitis B immunisation uptake. *Irish Journal of Medical Science,* 2005. 174(2): p. 14 – 20.

[113] Van Den Berg, C., et al., Full participation in harm reduction programmes is associated with decreased risk for human immunodeficiency virus and hepatitis C virus: evidence from the Amsterdam Cohort Studies among drug users. *Addiction,* 2007. 102(9): p. 1454 – 1462.

[114] Hurtado Navarro, I., et al., Differences between women and men in serial HIV prevalence and incidence trends. *European Journal of Epidemiology,* 2008. 23(6): p. 435 – 440.

[115] Judd A, H.M., Jones S, McDonald T, Parry JV, Stimson GV, Hall AJ., Incidence of hepatitis C virus and HIV among new injecting drug users in London: prospective cohort study. *BMJ,* 2005. 330: p. 24 – 5.

[116] Giuliani, M., et al., Increased HIV incidence among men who have sex with men in Rome. *AIDS,* 2005. 19(13): p. 1429 – 1431.

[117] Dukers, N.H.T.M., et al., HIV incidence and HIV testing behavior in men who have sex with men: using three incidence sources, The Netherlands, 1984 – 2005. *AIDS,* 2007. 21(4): p. 491 – 9.

[118] Brown, A.E., et al., Implications for HIV testing policy derived from combining data on voluntary confidential testing with viral sequences and serological analyses. *Sexually Transmitted Infections,* 2009. 85(1): p. 4 – 9.

[119] Baral, S., et al., Male sex workers in Moscow, Russia: a pilot study of demographics, substance use patterns, and prevalence of HIV-1 and sexually transmitted infections. *AIDS Care,* 2010. 22(1): p. 112 – 118.

[120] Sethi, G., et al., HIV, *sexually transmitted infections,* and risk behaviours in male sex workers in London over a 10 year period. *Sexually Transmitted Infections,* 2006. 82(5): p. 359 – 363.

[121] EMCDDA, Methodological guidelines to estimate the prevalence of problem drug use at local level. , CT.97.EP.05, Editor 2000, European Monitoring Centre for Drugs and Drug Addiction: Lisbon.

[122] UNAIDS and WHO, Guidelines on Estimating the size of populations most at risk, in UNAIDS Working Group on Global HIV/AIDS and STI Surveillance, UNAIDS/WHO, Editor 2010.

[123] Prasad, L.R., et al., Changing epidemiology of HIV anonymous testing in Switzerland for 1996 – 2006. *Swiss Medical Weekly,* 2009. 139(17 – 18): p. 256 – 63.

[124] UNGASS, National AIDS Program: UNGASS Country Progress Report: Albania, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[125] UNGASS, UNGASS Country Progress Report: Bosnia and Herzegovina, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[126] UNGASS Country Progress Report: Romania, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[127] UNGASS, UNGASS Country Progress Report: Republic of Armenia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[128] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2005., 2006, Institut de veille sanitaire: Saint-Maurice.

[129] Papadogeorgaki, H., et al., Prevalence of sexually transmitted infections in female sex workers in Athens, Greece – 2005. *European Journal of Dermatology,* 2006. 16(6): p. 662 – 665.

[130] Linhart, Y., et al., Sexually transmitted infections among brothel-based sex workers in Tel-Aviv area, Israel: high prevalence of pharyngeal gonorrhoea. *International Journal of STD & AIDS,* 2008. 19(10): p. 656 – 9.

[131] Gjenero-Margan, I., Kolari, B., Epidemiology of HIV Infection and AIDS in Croatia—An Overview. *Collegium Antropologicum*, 2006: p. 11 – 16.

[132] Bruckova, M., et al., HIV infection among commercial sex workers and injecting drug users in the Czech Republic. *American Journal of Tropical Medicine and Hygiene,* 2006. 75(5): p. 1017 – 1020.

[133] Ministry of Health, Research among populations at higher risk to HIV and among people living with HIV/AIDS. Basic results of surveillance research 2009 – 10. 2010. Ministry of Health, Republic of Serbia: Belgrade.

[134] Suleymanova, J., H. Gadirova, and S. Khasiyev, Seroepidemiological research of HIV, hepatitis B, C, syphilis and behavioural risk factors among most-at-risk gropus in Azerbaijan, in XVIII International AIDS Conference 2010: Vienna, Austria.

[135] UNGASS, Republic of Belarus: National Report on the Implementation of the Declaration of Committment on HIV/AIDS., United Nations General Assembly Special Session on HIV/AIDS, Editor 2008: Minsk.

[136] Uuskula, A., et al., A study on HIV and hepatitis C virus among commercial sex workers in Tallinn. *Sexually Transmitted Infections,* 2008. 84(3): p. 189 – 191.

[137] Tsereteli, N. and G. Lomidze, Low HIV prevalence among female sex workers in two cities of Georgia—contributing factors, in XVIII International AIDS Conference 2010: Vienna, Austria.

[138] Platt, L., et al., Impact of Gender and Sex Work on Sexual and Injecting Risk Behaviors and Their Association With HIV Positivity Among Injecting Drug Users in an HIV Epidemic in Togliatti City, Russian Federation. *Sexually Transmitted Diseases,* 2005. 32(10): p. 605 – 612.

[139] International AIDS Alliance, Behavioural monitoring and HIV infection prevalence among female sex workers as a component of second generation surveillance, 2009, *International AIDS Alliance*: *Kiev*.

[140] Kolemasova, S., Review of HIV prevention and risk factors associated with HIV infection among sex workers in Uzbekistan, in XVIII International AIDS Conference 2010: Vienna, Austria.

[141] Leuridan, E., et al., Male sex workers in Antwerp, Belgium: A descriptive study. *International Journal of STD and AIDS,* 2005. 16(11): p. 744 – 748.

[142] van Veen M.G., G.H.M., van Leeuwen P.A., Prins M., van de Laar M.J., HIV and sexual risk behavior among commercial sex workers in the Netherlands. *Archives of sexual behavior,* 2010. 39(3): p. 714 – 723.

[143] Diez, M., et al., HIV prevalence among men and transgender sex workers in Spain, in XVIII International AIDS Conference 2010: Vienna, Austria.

[144] UNGASS, UNGASS Country Progress Report: Hungary, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[145] UNGASS, UNGASS 2010 Country Progress Report: Lithuania. 2010.

[146] Mathers, B.M., et al., Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *The Lancet,* 2008. 372(9651): p. 1733 – 1745.

[147] Vandepitte, J., et al., Estimates of the number of female sex workers in different regions of the world. *Sexually Transmitted Infections,* 2006. 82: p. III18 – III25.

[148] Hayes, J., et al., Prevalence of Same-Sex Behavior and Orientation in England: Results from a National Survey. *Archives of Sexual Behavior,* 2011: p. 1 – 9.

[149] The Global Fund to Fight *AIDS,* T.a.M.G. *The Global Fund to Fight AIDS, Tuberculosis and Malaria. 2011* [cited 2011 3/1/2012]; Available from: http://www.theglobalfund.org/en/.

[150] Baćak, V., Midžić, D., Puhalo, A., Petrović, R., Report on behavioral and biological surveillance among injection drug users in Bosnia and Herzegovina, 2009: A respondent driven sampling survey, 2009.

[151] Ministry of Health of Republic of Macedonia, R.I.f.H.P., Bio-behavioral study conducted among young people and most at risk populations for HIV infection in Republic of Macedonia in 2007, 2008: Skopje.

[152] Meskovic, D., Behavioural surveillance survey of HIV/AIDS knowledge, attitudes and practices among MSM (unpublished), 2006, NGO Safe Pule of Youth: Belgrade.

[153] UNDP, Reversing the Epidemic. Facts and Policy Options, in HIV/AIDS in Eastern Europe and the Commonwealth of Independent States, T. Barnett, et al., Editors. 2004, United Nations Development Programme: Bratislava.

[154] Papoyan, A., babayanm V., Harutyunyan, A., Simonyan, M., Stepanyan, S., Grigoryan, T., Rapid assessment and response of HIV/AIDS among especially vulnerable young people in the Republic of Armenia, 2006, UNICEF: Yerevan.

[155] National AIDS Centre, K., Programme on counteraction of AIDS epidemics in The Republic of Kazakhstan for 2006 – 2010, 2006 Almaty.

[156] Oostvogels, R., HIV and men who have sex with men in the Kyrgyz Republic, Assessment and Review, 2005, *The Global Fund to Fight AIDS, Tuberculosis and Malaria: Bishkek*.

[157] Gheorgita, S., Scutelniciuc, O. Data provision and data use: Republic of Moldova. in Consultation Meeting on HIV prevention activities in MSM in ECA,. 2010. Kyiv, Ukraine.

[158] AIDS Project Management Group (APMG), Report on the project: 'Support to national AIDS response to scale up HIV prevention and care services in Tajikistan.', 2009, UNDP Tajikistan.

Chapter 3

Epidemiology of HIV in key populations at high risk

3.1 People who inject drugs

Injecting drug use is a major global health concern, with between 11 and 21 million people injecting drugs worldwide. [1] Overall, there are an estimated 4.8 million people who inject drugs (PWID) in the European region, with over 1.8 million of these living in the Russian Federation.[1] In Europe the estimated prevalence of injecting drug use among the adult population varies widely from being almost zero in some Central European countries (for instance Hungary) to more than one in twenty adults (for instance Azerbaijan). [1]

Blood borne viruses, including HIV, contribute significantly to the excess morbidity and mortality experienced by PWID. [2, 3] HIV has the potential to spread rapidly via the sharing of needles or syringes between PWID as well as via unprotected sex between PWID and their injecting and non-injecting partners. Sexual contact between PWID and non-injecting populations may in part explain the rise in HIV cases among heterosexual non-injectors in areas where injecting drug use was previously thought to be the principal route of transmission of HIV. [4] The risk of HIV infection after injecting with a contaminated needle is high, estimated to be around one in 125 injections, [5] compared with unprotected sex between heterosexuals which carries a risk of transmission of about one in 2,000 – 5,000 sex acts. [6] This goes some way to explaining the disproportionate burden of HIV among PWID in the region.

3.1.1 Demographic characteristics

Age and sex

Studies suggest that three times as many men as women inject drugs in Europe. Males make up a higher proportion of PWID In South-Eastern Europe, Central Asia and the Caucuses. Data from Georgia and Azerbaijan suggested over 95% of respondents were male. [7 – 13] Most research among PWID tends to recruit through services or in the community via drug user networks, so those without poorer access to services or with weak ties to such networks may be less likely to be included in a study. Female PWID are generally harder to reach than males and use services less and may thus be under-represented in studies. In Georgia, for example, it is estimated that there are about 8,000 female PWID, which is roughly 20% of problem drug users, and yet women only constitute around 8% of participants reached by harm reduction programmes and 1% reached by methadone programmes. [14]

PWID tend to be older in the West where the mean age was over 30 years, younger in the Centre (mid-twenties) and in the East (late twenties). Sentinel surveillance from Kazakhstan, Kyrgyzstan and Tajikistan in 2006 suggested that the median age of PWID ranged between 29 and 34 years. In 2009 the median ranged from 31 and 37 years, suggested that either the PWID population was aging with fewer

new initiates, or that sampling methods excluded younger people. [15] Many studies restrict recruitment to PWID aged 18 or over and so populations of younger injectors may be inadequately represented. A study of street-based adolescents (aged 10 – 19 years) in four cities in Ukraine reported that 15.5% had ever injected drugs and over half had done so in the previous month, the average age of initiation to injecting was between 14 and 16 years. [16] If this pattern is common throughout the region it is likely that a significant part of the PWID population has been underrepresented in studies to date.

The evidence suggests that the average age of male PWID is older than females: studies from France, [17] Belarus, [18] Russian Federation, [18] Ukraine, [18] England and Wales [19] all showed male respondents to be slightly over a year older than females on average. Evidence also suggests that age differs by type of drug used with amphetamine users tending to be younger than opiate users. A study of cocaine and heroin users (not all PWID) from Madrid, Barcelona and Seville in Spain showed that cocaine only users were generally younger than those who also used some heroin in addition to cocaine. [20] A study from Tallinn in Estonia reported amphetamine (psycho-stimulants) users as younger on average than fentanyl [synthetic opiate] users. [21] Studies which recruited exclusively from drug treatment centres tended to report respondents with higher average ages than those recruiting from the street and low threshold services. All demographic characteristics of PWID in European studies captured are presented in Appendix Tables 3.A.4 – 6.

Income and employment

The proportion of PWID reporting having regular income was generally low, although it is important to note the likelihood for underreporting of illegal earnings as well as the effect of low levels of employment within the wider community. In the West, the proportion reporting regular income ranged between 2% and 30%. Exceptions to this included Italy where higher levels of employment were reported of 79% (Northern Italy) and 56% (Southern Italy). [22, 23] In Marseille, France 65% reported receiving benefits in addition to the 18% who were employed. [24] In Central Europe the proportions of PWID in employment was generally between 20% and 35%. Similarly, in the East regular income and employment was generally less than 50%, although studies in Ukraine reported between six and seven respondents out of ten having full or part time employment. [25, 26] A study in St Petersburg, the Russian Federation reported 44% employment, although 76% reported having legal income. [27]

A study comparing PWID from Volgograd and Barnaul with a random sample of respondents from a Russian national household survey [28] provide more detail on the economic activities of PWID. PWID were likely to have a similar level of income to non-injectors of the same age, and although they were less likely to have a regular job, those out of work were more likely to be actively seeking one. PWID without regular work had a greater variety of additional sources of income than non-injectors who relied heavily on state support in the form of pensions and child benefit. PWID relied more on illegal activities such as selling sex or drugs and on money from parents or friends. These studies emphasise caution in generalising PWID to be without income or employment and without the potential to contribute to the economy. Recent research from Vancouver, Canada suggests that PWID involved in the labour market experience lower levels of HIV risk and prevalence than those not involved in the labour market, and that there is a relationship between increasing frequency of employment and decreasing HIV risk. [29]

3.1.2 Risk profile

Contact with criminal justice systems

Previous reviews suggest that prisons and other closed settings may act as structural determinants in the production of HIV risk, especially linked to drug injecting. [30 – 32] While drug use, and injecting, may continue in prison, access to harm reduction resources are reduced, with levels of risk consequently higher. A number of international studies link incarceration with an increased risk of HIV transmission among PWID. [32 – 34] Additionally, a strong emphasis on law enforcement, including through intense street policing of PWID resulting in caution, arrest, fine or detention, has been linked (directly and indirectly) with HIV vulnerability. Evidence, for example, links intensity of police contact and arrest with increased odds of syringe sharing among PWID. [35 – 39]

Table 3.1 Contact with the criminal justice systems in case study countries

	% PWID ever arrested	% PWID ever in prison	Harm reduction services available in prisons [40]
Estonia	49% – 66% (ever)	58% – 66%	OST
Russia	27% – 76%	6% – 37%	Not available
Tajikistan	44.5%	Not available	Not available

Source: PWID publications as per appendix tables 3.A.7-9.
Note: OST = opioid substitution therapy; PWID = people who inject drugs.

The data reviewed from Eastern Europe and the former Soviet Union suggests that between half and three-quarters of PWID have experienced arrest (see Appendix Tables 3.A.7 – 9). For instance, in Dushanbe, Tajikistan 45% of PWID had ever been arrested [41], while in Tallinn, Estonia, half of amphetamine users reported arrest in the last year, compared with two thirds of fentanyl users. [21] A study in Odessa, Ukraine (n=600) found that police beatings were common, with nearly 50% of respondents reporting at least one experience and police beatings linked to elevated of syringe sharing. [30, 39] Studies in other regions also suggest relatively high rates of police arrest. In Serbia and Montenegro (as it was), for example, 64% in Belgrade and 58% in Podgorica had experienced police arrest in the past 12 months. [42] Qualitative studies in the Russian Federation, as elsewhere, link police arrest and police violence to reduced capacity for risk reduction as well as increased risk behaviour. [43 – 45]

No reports on the prevalence of arrests among PWID in the West were identified although between 11% and 70% of PWID reported having spent time in prison. Elevated risk of injecting related harm while in prison is well documented, between 1% and 56% of prisoners report ever injecting while in prison. [46] In Estonia, between 58% and 66% of PWID had been in prison at least once, even among recent initiates into injecting new injectors (less than three years of injecting) where between 32 – 40% have experience of incarceration. [47] Reports of arrest or imprisonment, although varied, were consistently high across the region: in Georgia between 6% and 21% and in the Russian Federation between 6% and 37% reported experience of arrest; while experience of prison ranged from over 70% in Lithuania in 2007, 18% in Sofia, 50% in Belgrade and 43% in Podgorica. [48] [49] [42]

Some studies showed increased vulnerability associated with prison: in Finland 84% of HIV positive PWID and 67% of HIV negative PWID had been in prison; [50] and in Spain, experience of prison was associated with increased risk of recent injection of heroin (last 12 months) compared to only using cocaine among a sample of injectors and non-injectors. [20] In the Russian Federation in 2003 a study suggested male PWID were almost three times more likely to report ever having been in prison than female PWID. [44]

HCV infection

While the main focus of the review is HIV vulnerability, PWID in Europe are also vulnerable to hepatitis C infection (HCV). [51] Reviewed studies show HCV prevalence estimates between 52% and 94% among PWID in the West, 37% and 74% in the Centre, and between 54% and 96% in the East. There is generally a high prevalence of HCV co-infection among HIV positive PWID. [52, 53]

3.1.3 Injecting drug use practices

Duration of injecting

The duration of injecting careers varies across the region, and also at country level, but evidence suggests that PWID in the West have been injecting on average for over 10 years and in the East for between two and eight years. In the Centre, duration of injecting varied from five to ten years. [42, 54, 55] A review of hospital records in Israel reported a mean duration of injecting of less than a year among Israeli PWID. [56] Generally studies suggest that on average female PWID had been injecting for a shorter time than their male counterparts, although one study from St Petersburg reported both males and females having mean injecting careers of five years. [18] A study from Estonia highlighted differences in injecting

career between stimulant and opiate users, with 16% of amphetamine users injecting for less than two years and 33% injecting for more than five years compared with only 3% of fentanyl users injecting for less than two years and 68% injecting for more than five years. [21] A study in the United Kingdom found that PWID who reported getting most of their injecting equipment through secondary distribution had shorter injecting careers (mean 6.4 years) than PWID who got most of their equipment from pharmacies (mean 9.2 years) or low threshold services (mean 9.0 years). [57]

Drugs injected

Historically, heroin has been the main drug injected in the West and South of Europe, with amphetamines more common in Northern countries, and home-produced opiates and/or misuse of medicines in the Centre and East. Since the late 1990s, there has been an increase in heroin or opiate use in the Centre and East, as well as increases in cocaine as the predominant stimulant in South and West Europe compared to amphetamines in the North, Centre and East. [58] Case Study 3.1 considers how stimulant use and effects may link with HIV risk and transmission.

Heroin is noted as the drug of choice among injectors in Europe, although there are sub-regional differences, and poly-drug use is common (Table 3.2). Poly-drug use can be associated with increased harm to health through interactions between drugs, psychoactive substances increasing risk behaviours and reduced cognition that can lead to injury. [59] Cocaine use is also associated with cardiovascular problems. [60] In the West, poly-drug use is reported by 83.5% PWID in Italy in 2005 [61] and 55% in Sweden in 2002 – 3. [62] Speedball [a mix of cocaine and heroin] emerges as a key trend, and is reported for instance among 52% of PWID in the Netherlands, [63] 43 – 68% in Spain [20, 64] and 84.2% in Luxembourg. [65] There is an emerging culture of crack-based speedball injection that appears almost unique to the United Kingdom, [66] though a minority of PWID in France also report crack use. [17] Recent evidence in Finland suggests increasing buprenorphine use and injection among those with a history of buprenorphine treatment, with one report that 73% of PWID attending syringe exchanges used buprenorphine most frequently, 24% amphetamines and 2% other opioids. [67] Another study in Finland shows differences in drug use linked to HIV prevalence, with 52% of HIV positive PWID reporting amphetamine, 11% buprenorphine and 3% heroin as their main drug while among the HIV negative PWID 44% reported buprenorphine, 36% amphetamine and 16% heroin. [50]

Table 3.2 Injecting practices in case study countries

	Mean career duration	Main drugs injected	Percentage reporting daily injecting
Estonia	7.9 years	Fentanyl, mak, heroin, amphetamines	61%
Russia	5.5 – 7.2 years	Heroin	15% – 92%
Tajikistan	4.6 – 11.6 years	Heroin	39%

Source: PWID publications as per Appendix 3.A.4 – 6.

In the Republic of Moldova, [68] Belarus and the Russian Federation, the injection of home-produced opioids such as 'hanka' or 'shirka'(a liquid poppy extract) is reported alongside heroin injection, and in Ukraine, this is reported as the primary pattern of injection by between 79% and 94% of PWID. [25, 69] In Estonia, and initially following a heroin shortage, the use of the synthetic opiate, fentanyl [China White], has become common (among 61 – 74% of respondents in Tallinn and Kohtla-Jarvë), alongside amphetamine injection. [70, 71] Anecdotal reports in the Russian Federation also suggest recent shifts away from heroin injection towards the injection of liquid opioid solutions derived from pharmaceutical medicines. [72] Sentinel surveillance in Central Asia shows that heroin is injected by over 90% of PWID in Kazakhstan, Kyrgyzstan and Tajikistan. [15]

There are few reports of cocaine use in the East, but injection of metampthetamine is more common. The injection of home-produced liquid forms of methamphetamine [vint] or methcathinone [jeff or boltushka] derived from ephedrine or pseudoephedrine, are also reported in parts of Ukraine and the Russian Federation. [73] Some studies in Ukraine link home-produced cathinone-based injection [naturally occurring amphetamine contained in Khat] with legal restrictions on the sale of ephedrine-based medications.

[74] In Central Europe, heroin is reported as the main drug injected by between 48% and 97% of PWID while between 30% and 50% mainly inject amphetamines. [55, 75, 76] In the Czech Republic, for instance, the injection of crystal methamphetamine [pervitin or piko] is common. [58] The Czech Republic also has the highest prevalence of methamphetamine use in Europe. [73, 77, 78] Around 30% of PWID in Central Europe report poly-drug use. [79]

Home produced drugs have been linked with increased health harms including: the inclusion of variable quantities of unregulated ingredients; the use of human blood in the preparation in some areas; and the communal aspect of preparing and using the drugs such as injecting from a common container or with common needles. [74, 80, 81]

Case Study 3.1 Stimulant injection and HIV risk in Europe

The term stimulants includes both amphetamines and cocaine (including crack). While there is little evidence of physical dependence on amphetamines, unlike opiates there is no pharmacological substitute that can be used for treatment purposes and once a tolerance is developed withdrawal may be uncomfortable and linked to depression. [82] Cocaine injection is associated with more frequent and uncontrolled injection due to the shorter half-life of the drug which can lead to more injection and dosage related harms. [83] Although there is limited data on harms associated with injecting amphetamine-group substances, there is some evidence of high dependency, increased frequency of injecting, and among MSM in particular, increased sexual risk behaviours. [77]

The type of drug injected may be associated with HIV as well as distinct behavioural risks. [84] Among drug users followed for a year in St Petersburg, frequent stimulant use was the primary factor linked to HIV seroconversion. [85] The majority of stimulant users were also users of heroin and opiates, but those using stimulants three or more times a week were eight times more likely seroconvert (HR 8.1, CI 2.4 – 27.3). Having three or more sexual partners was also linked to HIV seroconversion (HR 2.6, CI 0.9 – 7.8).

Studies in Ukraine also associate rising levels of HIV prevalence with the injection of amphetamine-group substances.[74, 77] A comparison of stimulant injectors with opiate injectors found that stimulant users had shorter injection careers, were younger, and engaged in higher levels of drug and sexual risk behaviour. [86] PWID in Ukraine link the cheaper price and availability of stimulants as factors shaping the growing popularity of stimulants relative to opioids. [74, 87]

Studies outside Europe have also reported stimulant use as a correlate for HIV risk and seroconversion, [85] [88] [89] though there are exceptions, and in Estonia, amphetamine users were less likely to have ever shared a needle than fentanyl users (24% as opposed to 34%). [21]

3.1.4 Frequency of injection

The frequency of injection varies widely throughout and within countries. Frequency of injecting will depend on multiple factors including availability and quality of drugs, what drugs are injected and stage of injecting career. Data from the review suggested that daily injecting was more common among female PWID involved in sex work compared to non-sex workers and male PWID. [90] Studies in Hungary and Estonia report more frequent daily injecting among heroin or opioid than amphetamine users. [21, 79]

3.1.5 Risk practices

Needle/syringe sharing

In the West between 5% and 32% of PWID report sharing needles/syringes in the past four weeks (Appendix 3.A.4 – 6). Frequency of needle sharing in the East are more varied, ranging between 2% and 79% [48, 85] and in the Russian Federation alone between 8% and 79%. [85, 91] The estimate of 2% from Vilnius, Lithuania refers to receptive sharing in the past four weeks, [48] and most estimates range between 20% and 30%, with one study estimating sharing (receptive or distributive) in the past 30 days at 98%. [92] Among the Russian studies, frequency of sharing increased with age: the lowest reported frequency was from a study restricted to recent initiates (injecting for less than 3 years), [91] who were over five years younger on average than those reporting the highest frequency of needle sharing [85] (19.6 years vs. 24.3 years). Excluding these extreme results, the majority of studies from the Russian Federation reported rates ranging from 12% [93] and over 50%. [18] In Tajikistan, 65% of PWID reported injecting with a previously used needle/syringe in the past six months. [41] Data from Uzbekistan and Tajikistan suggest that while only 10% of young PWID shared a needle/syringe at their last injection, sharing paraphernalia is considered a social norm. [94] In Central Europe between 15% and 67% of PWID reported sharing a needle or syringe when they injected in the previous four weeks (Appendix 3.A.4 – 6).

Table 3.3 Risk practices in case study countries

	% sharing needles in past four weeks	% reported unprotected sex with casual partner	% sex work
Estonia	18% – 32%	26 – 58% (new injectors ≤3 years; 28 days)	2% – 17%
Russia	8% – 79%	34% (6 months)	Females: 24% – 32%; males: <1% – 5%
Tajikistan	37% last injection	55 – 100%	21% (males 13%, females 31%)

Source: Appendix 3.A.4 – 9.

Unprotected sex

Reported rates of risky sexual practices (generally measured by reported unprotected vaginal or anal sex) were generally much higher among PWID in the region than unsafe injecting practices. However, PWID throughout Europe were consistently more likely to use a condom with their casual partners than with regular ones. In the West rates of inconsistent condom use were between 72% and 83% with regular partners and between 28% and 44% with casual partners (Appendix 3.A.7 – 9). In the East, rates varied, with between 28% and 94% reporting inconsistent condom use with regular partners and 2% and 87% doing so with casual partners. In the Centre, a study from Sofia, Bulgaria showed that males reported less inconsistent condom use than females: 72% compared with 90% with regular partners and 44% compared with 61% with casual partners. [49] Conversely in Tashkent, Uzbekistan, 90% of males and 82% of females reported inconsistent condom use with their regular partners and 80% of males and 60% of females with their casual partner(s). [94, 95]

Sex work

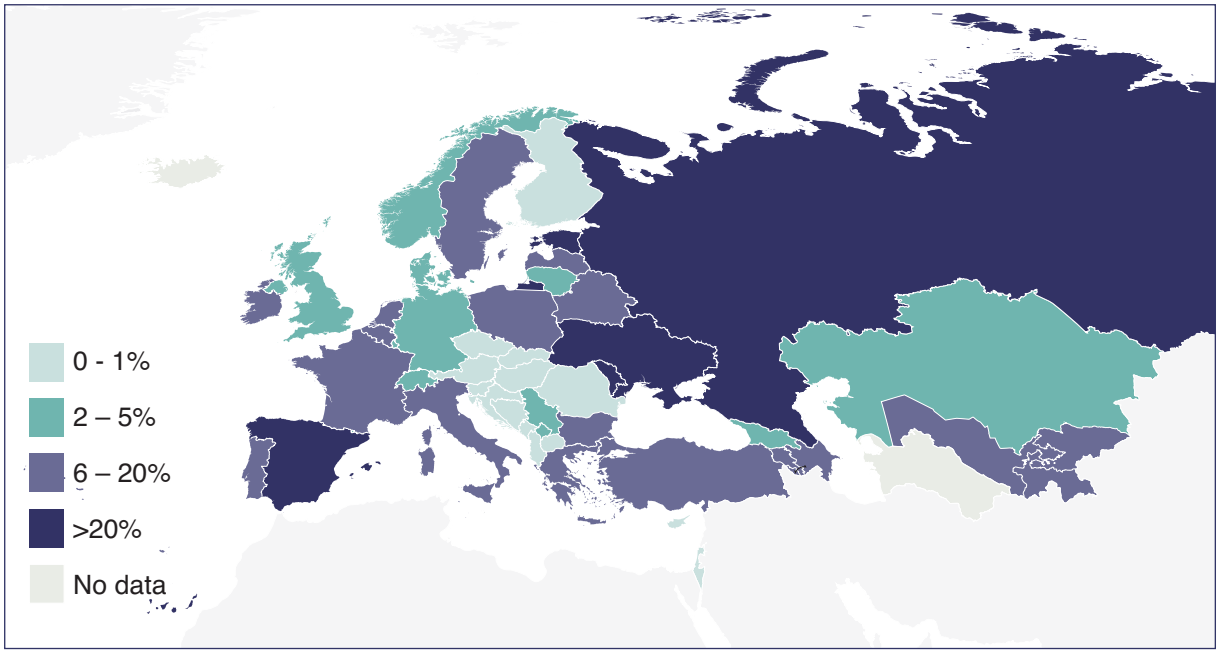
In the West between 15% – 20% of PWID had exchanged sex either for money or drugs, although no studies differentiated between males and females (Appendix 3.A.7 – 9). Studies in the East suggest that proportionally more female PWID exchange sex than their male counterparts. In Tallinn 6% of men reported receiving money for sex compared with 72% of women. [96] Additionally, this study reported that 34% of the males had paid for sex themselves. Studies from the Russian Federation show that between 25% – 32% of female PWID in St Petersburg and betweem1% – 5% of men reported selling sex in the last 6 months. [18] [12] [90] In Togliatti 50% had ever exchanged sex for money, drugs or goods and 43% in the last month. [85] Elsewhere in the region, reported rates of sex work were generally much lower; for instance, in Uzbekistan only 3% of respondents reported having exchanged sex for drugs and in Ukraine 5% reported having paid for sex and 3% reported having sold sex in the past three months. [26, 95] In Central Europe rates varied from as low as 0.2% in the Czech Republic in 1999 – 2000 [97] to 10% in Belgrade in 2005. [42]

3.1.6 HIV prevalence

a total of 91 sources identified by our systematic review (see Chapter 1) reported unique, primary HIV prevalence estimates among PWID in Europe; 24 from Western Europe, [17, 20, 22 – 24, 56, 61, 63, 64, 98 – 113] 44 from Eastern Europe and Central Asia [7 – 12, 15, 25 – 27, 41, 48, 69, 70, 85, 91, 93, 96, 114 – 140] and 21 from Central Europe [42, 49, 76, 79, 97, 141 – 156] and one that included data from Central and Eastern Europe, [92] and the EMCDDA Statistical Bulletin 2011, which provided estimates for many countries across the region. [46]

The review generated many and diverse prevalence estimates, with large variations seen across the sub-regions, countries and even cities. However, a discernable trend emerged with low to medium prevalence in the Central region, high to very high prevalence in the East and prevalence in the West evenly spread between low, medium and high (Appendix 3.A.1 – 3). It is important to note, that based on the available estimates, some countries fall within multiple categories (in the case of Spain, all four), and this may be due to city or area variations or to differing study methodologies. In order to better compare prevalence estimates across the region, we selected the ‘best national level prevalence estimates. Figures 3.1 – 3.4 and Table 3.4 show the ‘best’ estimates of HIV prevalence among PWID in Europe.

Figure 3.1 Map of 'best' estimates of HIV prevalence among PWID in Europe

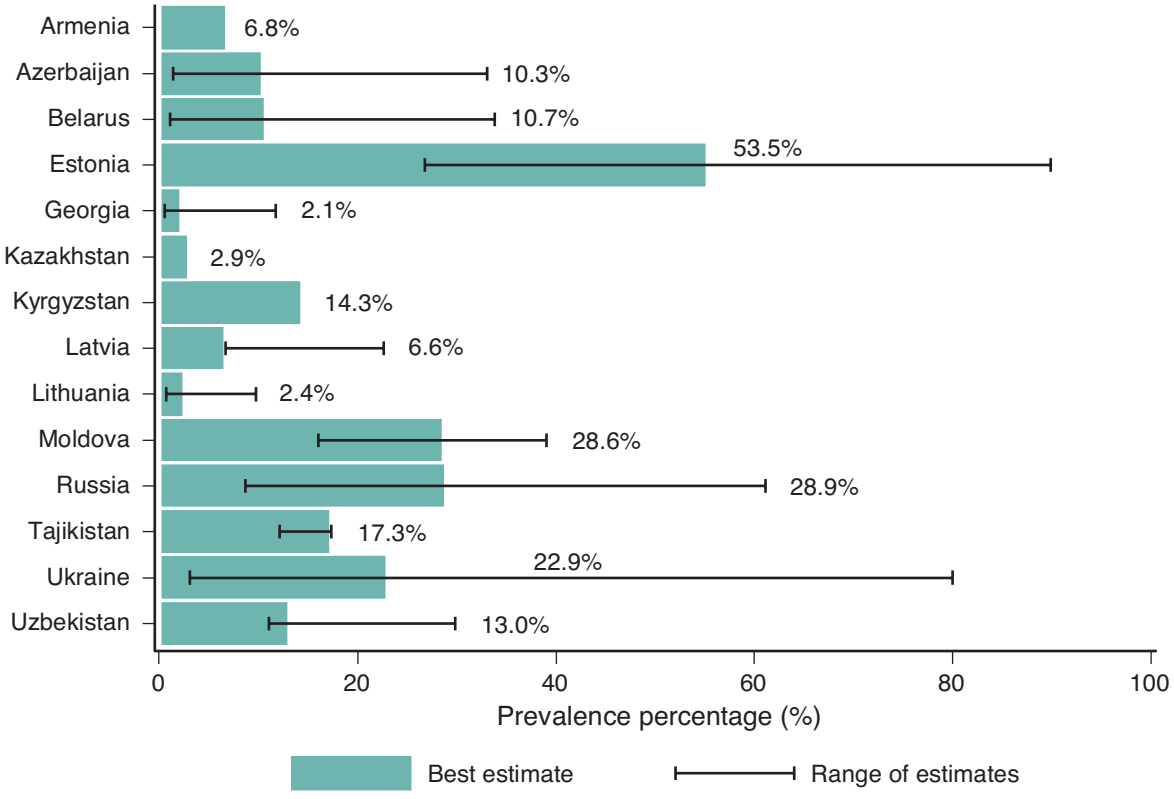


Source: Data from reports, as shown in Appendices 3.A.1-3.

East Europe

HIV prevalence among PWID is highest in the East and only Kazakhstan, Georgia and Lithuania can claim to have medium level epidemics, according to the studies examined here (Figure 3.2). Of the remaining 11 countries with data are categorised as high level epidemics (no data exists for Turkmenistan), four have prevalence estimates of over 20% and Estonia has a prevalence of over 50%.

Figure 3.2 'Best' estimates of HIV Prevalence among PWID in Eastern Europe

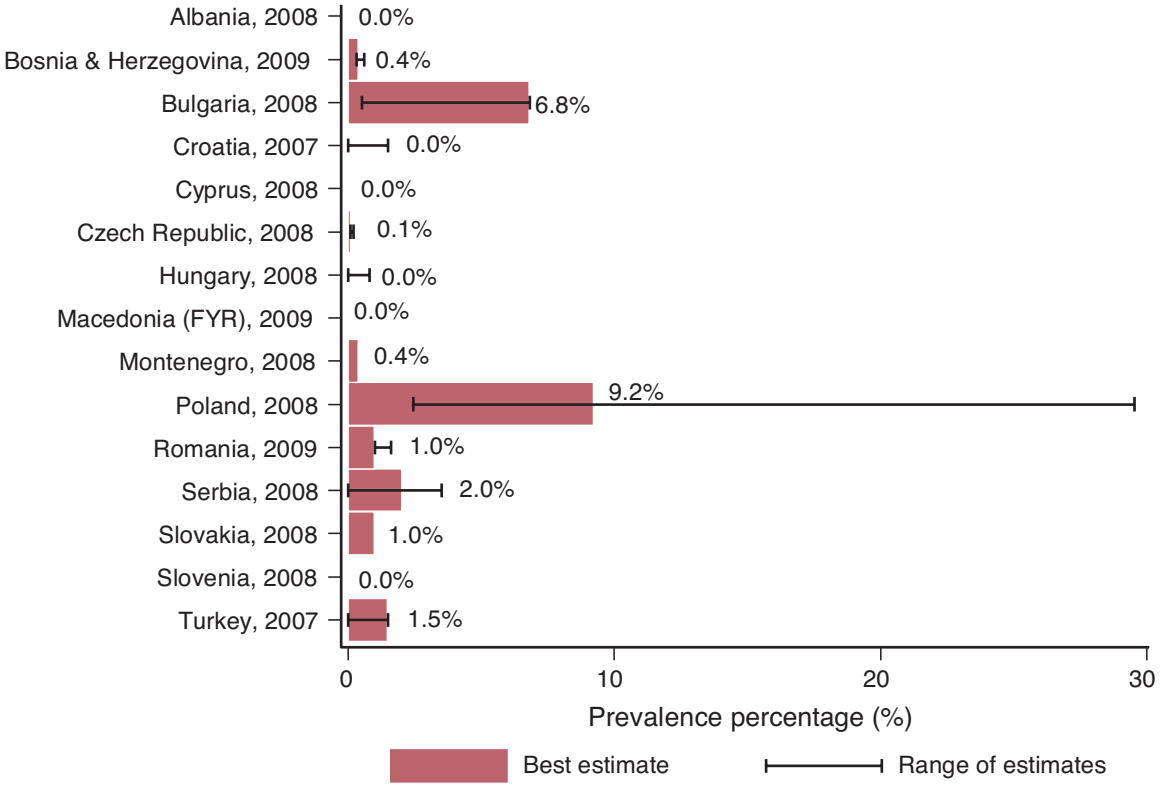


Source: Appendix 3.A.3.

Central Europe

Central Europe appears to have the lowest level of epidemic among PWID within the region. Only Poland and Bulgaria appear to have high level epidemics and neither of these exceed 10% prevalence (Figure 3.3). Several countries (Albania, Croatia, Cyprus, Hungary, The former Yugoslav Republic of Macedonia and Slovenia) report 0% HIV prevalence among PWID. However, this is the region with the fewest studies, and in general smaller sample sizes, so the estimates generated are less reliable than the 'best' estimates generated in the East or Centre.

Figure 3.3 'Best' estimates of HIV Prevalence among PWID in Central Europe



Source: Appendix 3.A.2

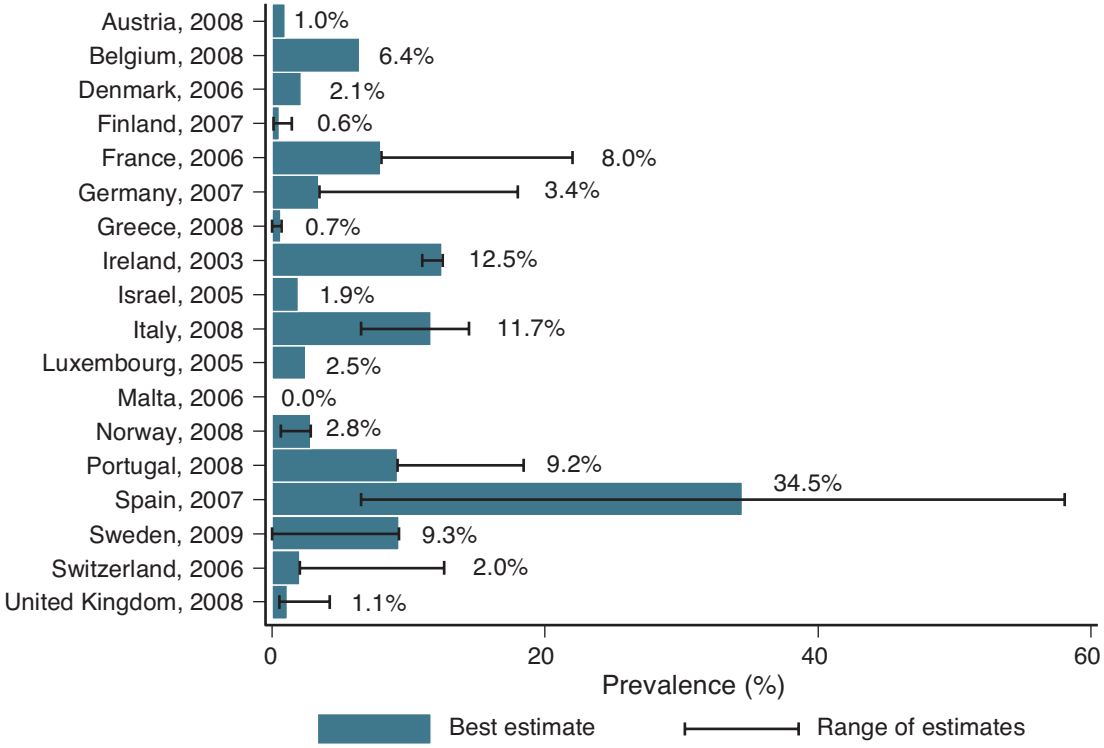
Western Europe

There is greater diversity in HIV prevalence in the West than East or Centre. Only Spain is identified here (by the study with the widest coverage) as having a very high epidemic among PWID, although other city-specific studies yield a range which includes far lower estimates (Figure 3.4). City level estimates from Spain range from as low as 7% among female PWID in Valencia [105] to 58% among male and female PWID in Barcelona [104]. The majority of the remaining countries have either low or medium level epidemics among PWID, although Ireland and Italy still appear to have prevalence levels of over 10%. Although there is no estimate of HIV among PWID in the Netherlands recent enough to be included in this review, data from 2003 indicates that prevalence in Rotterdam was 9.5% among PWID recruited from the street and drug treatment centres. [157]

Table 3.4 HIV epidemics in case study countries

	Total population, 2006 (1,000s) [158]	PWID adult prevalence [89]	"Best" estimate of PWID HIV prevalence	PWID HIV prevalence estimates range (see Appendix 3.A.3)	HIV Case Reports (2010) attributed to PWID per million people [159, 160]
Estonia	1,341	1.5%	53.5%	27% – 90%	46
Russia	141,394	1.8%	28.9%	9% – 61%	109
Tajikistan	6,836	0.6%	17.3%	12.1% – 17.3%	77

Figure 3.4 'Best' estimates of HIV Prevalence among PWID in Western Europe



Source: Appendix 3.A.1.

3.1.7 Factors linked to HIV

On account of low prevalence estimates, no studies examined risk factors linked to HIV in Central Europe, and so we summarise the findings of the 22 multivariate HIV risk factor analyses identified by our review in the West and East (see also Appendix 3.A.10 – 11).

The review identified 15 papers presenting multivariate analyses of factors associated with HIV in the East [25, 26, 41, 70, 85, 90, 93, 121, 134, 137, 138, 161 – 164] although two [41, 162] present new analyses of data already published in other papers also presented here. [90, 163] The review identified seven papers presenting multivariate analyses of factors associated with HIV prevalence [22, 61, 99, 102, 103, 105] in the West although two described different analyses of the same dataset, [102, 103] and one paper presenting multivariate analyses of HIV incidence. [63]

Synthesising the associations

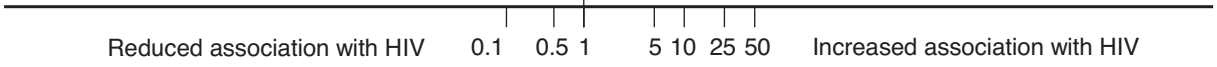
The forest plots summarised in Figure 3.5 and Figure 3.6 summarise the effects of individual and structural risk factors on HIV identified through the multivariate studies. Although studies measure similar risk factors, it is important to note that each may have carried out analyses differently and adjust for different confounding variables. Full details of the studies and factors presented can be found in Appendix 3.A.10 – 11.

Figure 3.5 summarises individual level risk factors. Many studies investigated the link between HIV and injecting with a used needle, or sharing a needle, not always specifying whether distributively or receptively. The majority of studies suggest increased HIV risk associated with sharing needle/syringes, most results are inconclusive. Injecting with the used needle of a sex partner was found in Volgograd [93] and Tallinn [161] to clearly increase an individual's odds of HIV. More definitively, injecting with a needle previously used by someone known to have HIV or hepatitis C is shown in most studies to be clearly positively correlated. [25, 90] Daily injecting is also found to be linked to increased risk of HIV. For instance, a study in Volgograd, Russian Federation [93] found daily injectors to have 7 time the odds of HIV than those who inject less frequently (95% CI 1.9 – 25.1). Many reviewed studies also associate longer injecting careers with greater odds of having HIV, for each extra year injecting (data not shown). [90] This is usually explained as a function of increased risk exposure time.

Studies in Estonia found that primary injectors of an opiate (fentanyl) had between three and four and a half times greater odds of HIV infection than individuals who primarily inject amphetamines. [161, 165] A study in Ukraine (Kiev, Odessa and Makeevka/Donetsk) identified injecting a sedative/opiate mix in the past 30 days (AOR 1.63, 95%CI 1.13 – 2.35) as associated with HIV. [134] However, a Russian Federation study found no difference in an individual's odds of HIV according to the primary drug they inject. [93] An analysis of a St Petersburg cohort examining multivariate association with HIV incidence found that frequency of injecting psycho-stimulants was the only risk factor significantly associated with HIV (reference group: none, one to two times adjusted hazard ratio 1.98, 95%CI 0.7 – 5.57; three or more times adjusted hazard ratio 8.15, 95%CI 2.43 – 27.34) following adjustment for number of sex partners and sex work in the past six months. [85]

Figure 3.5 Adjusted effect estimates of individual level risk factors among PWID

Risk Factor	ES (95% CI)	City	Country	Ref.
Injecting frequency				
Daily	0.60 (0.19, 1.60)	Moscow	Russia	93
Daily	6.90 (1.91, 25.08)	Volgograd	Russia	93
Daily	0.80 (0.32, 1.86)	Barnaul	Russia	93
Daily	1.16 (0.83, 1.62)	Tashkent	Uzbekistan	138
Daily	1.49 (1.03, 2.17)	3 cities	Ukraine	134
Daily	1.10 (0.70, 2.00)	Tallinn	Estonia	161
Daily	0.87 (0.72, 1.05)	16 cities	Ukraine	26
Daily (ethnic Tajik)	2.16 (1.00, 4.66)	Dushanbe	Tajikistan	163
Daily (opiates)	2.20 (1.05, 4.46)	Vinnitsya	Ukraine	25
Daily*	0.90 (0.45, 1.95)	Togliatti	Russia	162
Needle or syringe sharing				
Ever shared	3.40 (2.20, 5.30)	3 cities	Spain	102
Ever shared	3.50 (1.40, 8.40)	Moscow	Russia	93
Ever shared	0.50 (0.10, 1.94)	Volgograd	Russia	93
Ever shared	1.00 (0.57, 1.57)	Barnaul	Russia	93
Iinjected with used needle in past 4 weeks‡	1.70 (0.32, 8.57)	Togliatti	Russia	90
Injected with used needle in past 4 weeks	0.50 (0.18, 1.50)	Moscow	Russia	93
Injected with used needle in past 4 weeks	0.30 (0.02, 3.21)	Volgograd	Russia	93
Injected with used needle in past 4 weeks	0.90 (0.61, 1.37)	Barnaul	Russia	93
Injected with used needle in past 4 weeks**	0.80 (0.41, 1.69)	Togliatti	Russia	90
Injected with used needle in past 4 weeks**	0.80 (0.35, 1.85)	Togliatti	Russia	162
Injected with used needle in past 4 weeks†	4.10 (1.01, 16.60)	Togliatti	Russia	90
Injected with used needle in past 6 months	2.51 (1.86, 3.37)	Tallinn	Estonia	121
Injected with used needle of a sex partner in past 4 weeks	9.60 (2.00, 47.00)	Volgograd	Russia	93
Injected with used needle of a sex partner in past 4 weeks	2.40 (1.40, 4.30)	Tallinn	Estonia	161
Shared in past 4 weeks	1.10 (0.60, 2.00)	Tallinn	Estonia	161
Shared in past 4 weeks	1.54 (1.00, 2.36)	St Petersburg	Russia	164
Needle or syringe sharing with known risk				
Injected with used needle from someone known HIV+ ‡	0.10 (0.01, 1.35)	Togliatti	Russia	90
Injected with used needle from someone known HIV+**	0.60 (0.14, 2.13)	Togliatti	Russia	90
Injected with used needle from someone known HIV+†	2.30 (0.17, 30.60)	Togliatti	Russia	90
Injected with used needle with someone known HCV+ ‡	2.60 (0.42, 16.30)	Togliatti	Russia	90
Injected with used needle with someone known HCV+**	2.90 (1.45, 5.85)	Togliatti	Russia	90
Injected with used needle with someone known HCV+†	1.20 (0.28, 4.85)	Togliatti	Russia	90
Shared with HIV+ person in past year	3.40 (1.24, 9.30)	Vinnitsya	Ukraine	25
Primary drug injected in past 4 weeks				
Heroin (ref Mak/ Vint)	1.00 (0.56, 1.78)	Barnaul	Russia	93
Heroin (ref Mak/ Vint)	1.00 (0.39, 2.38)	Moscow	Russia	93
Opioid (ref amphetamine)	3.30 (1.70, 6.40)	Tallinn	Estonia	161
Opioid (ref amphetamine)	4.43 (2.74, 7.18)	Tallinn	Estonia	121
Number of sex partners				
Higher number of sex partners in past 6 months	2.66 (0.91, 7.79)	St Petersburg	Russia	85
Higher number of sex partners in past year	1.20 (0.56, 2.39)	Moscow	Russia	93
Higher number of sex partners in past year	1.40 (0.38, 5.03)	Volgograd	Russia	93
Higher number of sex partners in past year	0.71 (0.36, 1.49)	Barnaul	Russia	93
Higher number of sex partners in past year	1.50 (0.90, 2.60)	Tallinn	Estonia	161
Higher number of sexual partners in past month	1.05 (0.76, 1.46)	Tashkent	Uzbekistan	138



Source: Appendix 3.A.10 – 11.
Notes: See original papers for full details of models. Ref. = reference; * = new people who inject drugs (PWID) (≤3 years); ** = male people who inject drugs (PWID); †=female (non-sex workers[SW]) people who inject drugs (PWID); ‡ = female sex worker (SW) people who inject drugs (PWID).

In relation to HIV and sexual risk, most multivariate analyses examined the effect of exchanging sex for drugs or money, the number of sexual partners, and unprotected vaginal or anal sex, as risk factors. Although several strong univariate associations were found, these tended not to hold in the multivariate models once adjusting for confounding. This could be because sample sizes were insufficient or because much risk sexual behaviour is determined by other factors such as gender, socio-economic status or injecting behaviour.

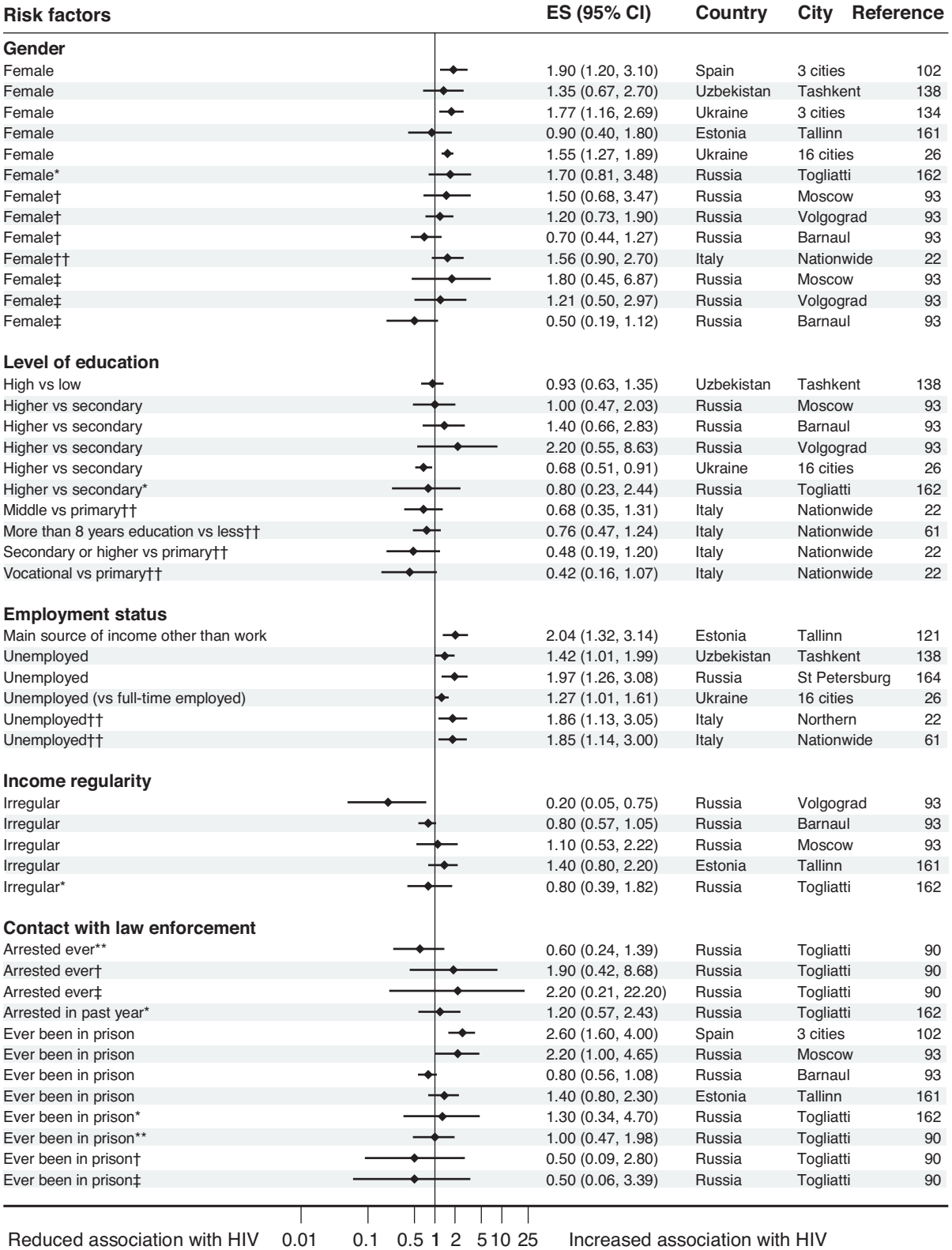
Figure 3.6 summarises the social-structural level risk factors. Although most studies presented adjusted odds ratios identifying female gender as a risk factor for HIV, the results are generally inconclusive with confidence intervals that straddle 1. This association is likely to have indirect, rather than biological, causative roots through pathways involving multiple linked socio-economic differences related to gender. Qualitative data from Ukraine report that female PWID are at risk of psychological, physical (including sexual) and economic violence from their partners. It is harder for them to negotiate safer sex or safer injecting practices or to access services which elevates risk of HIV. [166] A global review on the lives of female PWID supports this research and promotes harm minimization measures and drug treatment for women including psychological services to deal with violence, while programmes for men should include services around anger management, domestic abuse counselling, and partner support programs. [167]

Multiple studies link HIV to the socio-economic status of PWID, though economic status is defined through different measures, including level of education, employment (regular or not) and income (regular or not, legal or not). Of these measures only an individual's employment status showed a consistent association with HIV, with unemployed individuals or those having a main source of income other than legitimate work, showing greater odds of HIV than others. [22, 26, 61, 121, 138, 164] The effects of not having a regular source of income on the odds of being HIV infected are unclear, appearing to have no association, or possibly a negative one. The lack of association with income may be an anomaly or unique to these settings, though it is important to note that the ways in which HIV links to wealth and poverty is shaped by social context, and in some settings—arguably in these cases—drug injecting has diffused among those whose economic status may be comparable to the wider local population more generally. [93] An Estonian multi-level study included neighbourhood level data in its analyses and found neighbourhood level effects of unemployment (10% increment in unemployment AOR 5.95, 95% CI 2.47 – 14.31) and habitat change since 1989 (10% change AOR 1.89, 95% CI 1.09 – 3.26) both associated with HIV prevalence.(results not presented). [121]

Several studies have examined contact with law enforcement agencies as a structural factor linked with the odds of being HIV infected, although the results shown have large confidence intervals and are inconclusive. The strongest individual association between history of incarceration and HIV is seen in a study from Spain, [102] with weaker results from Moscow, Russian Federation. [93] Few studies examined the effect of arrest, however evidence from qualitative research in the region supports relationships between policing practices, including extra-judicial ones such as police violence, and increased vulnerability to HIV, including through reduced capacity for risk avoidance as a consequence of safety shortcuts and rushed injections borne out of a fear of detection or arrest. [39, 43, 44, 168, 169]

The association between some structural risk factors including ethnicity and HIV were found to be context specific. A study in Tajikistan found that respondents identifying as Tajik (AOR 7.06, $p<0.001$) or other ethnicity (AOR 6.05, $p<0.001$) as opposed to Russian were at higher risk of testing HIV positive, once adjusted for other factors including gender. [41] A study in Uzbekistan similarly found respondents of Uzbek ethnicity to have higher odds of HIV than their Russian counterparts (AOR 1.20, 95% CI 0.80 – 1.80) , [138] however a study in Estonia found that ethnic Estonians had a reduced odds of HIV compared with those of Russian or other backgrounds (AOR 0.63, 95%CI 0.28 – 1.25). [71] An association between HIV among PWID and being of a minority ethnicity that cannot otherwise be explained by needle/syringe sharing has been noted elsewhere, and linked to material as well as other social inequalities, including access to support services. [170, 171] A subsequent analysis among the ethnic Tajik subset of this study identified ever having experienced drug treatment as a risk factor for HIV (AOR 2.75, 95% CI 1.22 – 6.22). [163]

Figure 3.6 Adjusted effect estimates of social-structural risk factors among PWID



Risk factors	ES (95% CI)	Country	City	Reference
Gender				
Female	1.90 (1.20, 3.10)	Spain	3 cities	102
Female	1.35 (0.67, 2.70)	Uzbekistan	Tashkent	138
Female	1.77 (1.16, 2.69)	Ukraine	3 cities	134
Female	0.90 (0.40, 1.80)	Estonia	Tallinn	161
Female	1.55 (1.27, 1.89)	Ukraine	16 cities	26
Female*	1.70 (0.81, 3.48)	Russia	Togliatti	162
Female†	1.50 (0.68, 3.47)	Russia	Moscow	93
Female†	1.20 (0.73, 1.90)	Russia	Volgograd	93
Female†	0.70 (0.44, 1.27)	Russia	Barnaul	93
Female††	1.56 (0.90, 2.70)	Italy	Nationwide	22
Female‡	1.80 (0.45, 6.87)	Russia	Moscow	93
Female‡	1.21 (0.50, 2.97)	Russia	Volgograd	93
Female‡	0.50 (0.19, 1.12)	Russia	Barnaul	93
Level of education				
High vs low	0.93 (0.63, 1.35)	Uzbekistan	Tashkent	138
Higher vs secondary	1.00 (0.47, 2.03)	Russia	Moscow	93
Higher vs secondary	1.40 (0.66, 2.83)	Russia	Barnaul	93
Higher vs secondary	2.20 (0.55, 8.63)	Russia	Volgograd	93
Higher vs secondary	0.68 (0.51, 0.91)	Ukraine	16 cities	26
Higher vs secondary*	0.80 (0.23, 2.44)	Russia	Togliatti	162
Middle vs primary††	0.68 (0.35, 1.31)	Italy	Nationwide	22
More than 8 years education vs less††	0.76 (0.47, 1.24)	Italy	Nationwide	61
Secondary or higher vs primary††	0.48 (0.19, 1.20)	Italy	Nationwide	22
Vocational vs primary††	0.42 (0.16, 1.07)	Italy	Nationwide	22
Employment status				
Main source of income other than work	2.04 (1.32, 3.14)	Estonia	Tallinn	121
Unemployed	1.42 (1.01, 1.99)	Uzbekistan	Tashkent	138
Unemployed	1.97 (1.26, 3.08)	Russia	St Petersburg	164
Unemployed (vs full-time employed)	1.27 (1.01, 1.61)	Ukraine	16 cities	26
Unemployed††	1.86 (1.13, 3.05)	Italy	Northern	22
Unemployed††	1.85 (1.14, 3.00)	Italy	Nationwide	61
Income regularity				
Irregular	0.20 (0.05, 0.75)	Russia	Volgograd	93
Irregular	0.80 (0.57, 1.05)	Russia	Barnaul	93
Irregular	1.10 (0.53, 2.22)	Russia	Moscow	93
Irregular	1.40 (0.80, 2.20)	Estonia	Tallinn	161
Irregular*	0.80 (0.39, 1.82)	Russia	Togliatti	162
Contact with law enforcement				
Arrested ever**	0.60 (0.24, 1.39)	Russia	Togliatti	90
Arrested ever†	1.90 (0.42, 8.68)	Russia	Togliatti	90
Arrested ever‡	2.20 (0.21, 22.20)	Russia	Togliatti	90
Arrested in past year*	1.20 (0.57, 2.43)	Russia	Togliatti	162
Ever been in prison	2.60 (1.60, 4.00)	Spain	3 cities	102
Ever been in prison	2.20 (1.00, 4.65)	Russia	Moscow	93
Ever been in prison	0.80 (0.56, 1.08)	Russia	Barnaul	93
Ever been in prison	1.40 (0.80, 2.30)	Estonia	Tallinn	161
Ever been in prison*	1.30 (0.34, 4.70)	Russia	Togliatti	162
Ever been in prison**	1.00 (0.47, 1.98)	Russia	Togliatti	90
Ever been in prison†	0.50 (0.09, 2.80)	Russia	Togliatti	90
Ever been in prison‡	0.50 (0.06, 3.39)	Russia	Togliatti	90

Notes: See original papers for full details of models; * = new people who inject drugs (PWID) (≤3 years); ** = male people who inject drugs (PWID); † = female (non-sex workers [SW]) PWID; ‡ = female sex workers (SW) people who inject drugs (PWID); †† = Sample not 100% injectors, see text for details.

This association could be interpreted in a number of ways, including patients sharing contaminated needles for covert injecting while in treatment, or possibly medical staff using contaminated equipment themselves. [172] In parts of Eastern Europe where PWID are often required to register as such to obtain drug treatment or are forced to through contact with police, and this can lead to increased social marginalisation as well as reducing their ability to gain employment or even to drive a car. [173] In Moscow and

Tallinn ever having registered as a PWID at drug treatment was found to be associated with more than double the odds of HIV (AOR 2.4, 95%CI 1.3 – 4.7; AOR 2.4, 95% CI 1.5 – 3.8 [161]). [93] Conversely, a study in Togliatti in the Russian Federation conducted among 96 new (<three years) injectors found having been in drug treatment in the past as negatively associated with risk of HIV (AOR 0.4, 95%CI 0.1 – 1.0 [91]).

Risk associated with HCV

Evidence from the Russian Federation, Serbia and Ireland suggests that the odds of being HCV positive increase with age or duration of injecting career. [101], [42, 174] Other individual risk factors for HCV positivity include daily or frequent injection, [41, 169] and sharing injecting equipment. [10, 25, 41, 52, 169] Structural factors have also found to be associated with risk of HCV. Experience of imprisonment or contact with criminal justice agencies emerges as a risk factor for HCV positivity in some settings. In Serbia and Georgia increased risk of HCV was associated with ever having been in prison, [8, 42] in Montenegro with having been detained by police in the last year, [42] and in Tajikistan with ever having been arrested. [41] Risk of HCV was also higher among female PWID. [41, 169]

3.1.8 Concluding comment

The systematic review of epidemiological literature among PWID find that HIV prevalence varied widely in Europe, with generally low or medium (<5%) prevalence in the West and Centre and high (>10%) prevalence in the East, especially in Estonia, the Russian Federation, the Republic of Moldova and Ukraine. We found evidence for a number of structural factors associated with HIV, including gender, contact with criminal justice systems, and socio-economic position.

3.2 Sex Workers

In many parts of the world, HIV prevalence has been documented to be higher among sex workers (SWs) than non-sex working populations. This pattern also occurs among male and transgender sex workers. Women account for an increasingly disproportionate number of HIV infections globally. [1] Of particular concern are dramatic increases in HIV among young women, who now make up over 60 per cent of 15 to 24 year-olds living with HIV/AIDS. Globally, young women are 1.6 times more likely to be living with HIV/AIDS than young men. In Europe the majority of PLHIV are men, but this pattern is changing with a increasing number of cases among women, mostly in the East. [1] Factors known to increase sex workers' vulnerabilities to HIV infection are a lack of protective policies and legislation, limited information, lack of access to services as well as lifestyle factors. [2] With this mind, we examine here the extent and risk of HIV among SWs across Europe within a broader sexual health framework that encompasses vulnerability as it also relates to stigma, mental health, sexual health, violence and drug use.

3.2.1 Demographic characteristics

The European Network for HIV/STI Prevention and Health Promotion among Migrant Sex Workers (TAMPEP) estimate that 87% of sex workers in EU member states are women; 7% male and 6% transgender. The distribution of sex in this part of the region varies: Austria, Finland, Denmark, Estonia and Lithuania report almost exclusively FSWs; while countries in the West, such as France, Greece, Luxembourg, Belgium and Italy report more transgender sex workers. [3]

Across the region women working in the sex industry are predominantly aged between 20 and 30 years. The range of mid-point ages was wider in West than in Central and East Europe, suggesting a slightly younger population in the East and Centre. The mean or median age of sex workers working in studies in London, [4 – 6] Milan, [7] Catalonia [8] and Israel [9 – 10] range between 20 and 30 years. Data from the East suggest that street-based FSWs are younger with a mid-point age ranging between 21 and 27 years. [11 – 15] The only exception was Armenia where the population was older at 33.7 years. In Central Europe, the average age of sex workers ranges between 22 and 28 years. [16 – 18] There is some evidence to suggest that age varies among sub-populations of sex workers. In the Netherlands, non-drug using female sex workers and transgender SWs were younger than their drug-using counterparts (median = 30 vs 37 years). [19] In London and Athens migrant women from EE and FSU were younger than their United

Kingdom-born or Greek counterparts. [4, 20] However, migrant street sex workers in Barcelona were older than non-migrants with a median age of 38.5 years. [21] For MSWs, mid-point ages ranged between 22 and 30 years. All demographic and risk behaviours are summarised in Appendices 3.A.19 – 20.

3.2.2 Risk profile

Drug use

Evidence shows that drug misuse and particularly injecting drug use occurs more frequently among street-working women than off-street sex workers across the region, with managers of off-street establishments less tolerant of drug use. [6, 22 – 26]

Case Study 3.2 Sex work and drug use

In the United Kingdom, sex workers who misuse drugs are at increased risk of violence, unsafe sexual practices, pregnancy terminations, and problems with the police. [38 – 39] In terms of broader sexual health indicators, international evidence shows drug dependence as the key factor influencing street sex workers' decision to continue selling sex during pregnancy and post-natally, [40] as well as adverse health outcomes on pregnancy and the fetus. [41]

Data from five cross-sectional studies of sex workers and PWID in three Russian cities (Moscow, Volgograd and Barnaul) collected during 2003 and 2004 (n=280) indicated that sex workers who inject drugs may lead a more 'chaotic' or 'transitional' lifestyle: they are younger, less likely to have completed secondary education and more likely to live in temporary accommodation. They engaged in higher levels of sexual risk. They report having fewer clients for vaginal or anal sex per month but are less likely to use condoms consistently with clients. They report significantly more non-paying casual sex partners in the last year and more non-paying sex partners who also inject drugs, suggestive of sex being exchanged for drugs or as a means to obtain drugs and not simply for economic gain, arguably pointing to a less professional approach to sex work.

Comparison in demographic characteristics and sexual risk behaviours between IDU and non-IDU sex workers in Russia

Sex workers					
	Non injecting drug users		Injecting drug users		
Characteristic	**n**	**% or mean (SD)**	**n**	**% or mean (SD)**	***p* value**
Total	89/280	31.8%	191/280	68.2%	
Completed secondary education	31/81	38%	41/189	22%	<0.01
Live in temporary accommodation	6/89	7%	57/191	30%	<0.001
Inconsistent use of condoms with clients in last month	16/82	20%	28/76	38%	0.02
Age (years)		24.2 (6.3)		22.7 (4.6)	0.03
Number of clients per month		65.6 (70.2)		45.0 (47.8)	0.01
Number of non paying sex partners per year		4.6 (16.2)		7.9 (16.5)	0.12
Number of casual sex partners in last year		0.5 (1.1)		3.0 (7.8)	<0.01
Number of IDU sex partners in the last year		0.2 (0.7)		2.1 (5.8)	<0.01

Note: IDU = injecting drug user; SD = standard deviation; n = sample size; *p* = probability value; % = percentage.

Studies in West Europe suggested a decline in injecting among street-working women with the increasing number of migrant women in the sex industry. [7, 21, 27 – 29] Some drug use is reported among migrant SWs: in the Netherlands 18% of FSWs working in a range of street and off-street locations reported using drugs in the last six months and had a history of injecting, including some migrant women. [19] In London, some injecting drug use was reported among off-street sex workers including migrants (between 4 and 11% had ever injected) but little current injecting (1%). [4, 30] Limited data were available on drug use among sex workers in Central Europe. One study specifically targeting young sex workers aged 15 to 24 years suggested a highly vulnerable population, almost a quarter of the sample had ever injected [31]

and another study in the Czech Republic suggested that 10% of FSWs and 38% of MSWs had a history of injecting drug use. [18] Studies of street FSWs in East Europe suggest a closer link between sex work and injecting drug use but levels of injecting vary at a city level. A high prevalence is reported in Vinnitsa in the Ukraine (71%) [32] and 97% in Saint Petersburg, [33] while prevalence is lower in Samara and Saratov (between 7 and 14%) [34] and around 6% in Estonia and Georgia. [35 – 36] Overall an average of 15% of FSWs had injected in the last 30 days across multiple cities in the Ukraine. [24] Studies of PWID, particularly in the Russian Federation, show consistently high levels of sex work among female PWID ranging between 24% – 50%. [13 – 14] Estimates from Central Asian Republics suggest that 62% of female drug users in Kyrgyzstan (n=73) and 89% in Azerbaijan (n=150) also engage in sex work. [37]

Violence

There is a growing body of international evidence demonstrating the association between risk of HIV and experience of violence among sex workers. [42 – 46] Experience of violence has similarities with HIV in that it is concentrated among marginalised vulnerable populations. [45] The interplay of violence and HIV among sex workers has direct pathways such as forced unprotected sex as well as indirect pathways such as reducing self esteem and ability to negotiate safer practices for fear of further violence; increasing drug use or forced relocation of sex work to less familiar or safe areas. [46 – 49]

Data from Europe show that levels of sexual and physical violence among sex workers were universally high, particularly among minority groups such as Roma populations and transvestites. [47, 50] Qualitative data from Western Europe suggest that violence among sex workers is ubiquitous and compounded by drug use and the stigma associated with sex work. [25 – 26, 51] Violence was the most frequently reported risk associated with work by respondents of the TAMPEP study who reported violence from clients, robberies and verbal abuse from the police. In London, a third of sex workers (n=268) had experienced some form of physical or sexual violence from clients in the last 12 months. [4]

In Central and East Europe, higher levels of violence are reported than in the West. In Moscow, Saratov, Samara and Ekaterinburg in the Russian Federation between 20 and 76% of street sex workers reported an incidence of sexual violence in the last 12 months. [11, 15, 52] In Armenia, 30% of street sex workers reported a lifetime experience of forced sex from clients [53] and 54% had experienced violence from clients in the Republic of Moldova. [11] In Croatia, between 30 and 52% of female sex workers reported incidents of physical abuse in the last 12 months [54] and in Kosovo 16% of street and off-street sex workers reported being forced to have sex in the last 12 months. [17] Younger sex workers may be more vulnerable to violence: in Romania 46% of a sample of female sex workers (aged 16 to 24 years) had been forced to have sex in the last 12 months. [31] In Moscow, 28% of MSWs had ever experienced violence from clients. [55] Qualitative data from Central and Eastern Europe and Central Asian republics suggested that physical violence from the police was ubiquitous among male and transgender sex workers and in some countries (Kyrgyzstan, Lithuania, Ukraine, Russian Federation, The former Yugoslav Republic of Macedonia and Bulgaria) police were cited as the main threat to personal safety. [56] Qualitative interviews among female Roma and transvestite sex workers from Serbia highlight the practice by police of using violence and threats of violence to discourage women from engaging in sex work and extorting money. This ‘moral enforcement’ forces women to work in unfamiliar locations to avoid police harassment as well as working longer hours [50] and hurrying to negotiate with a client and thus reducing the time available to assess the potential risks. [56]

Mental health and stigma

Research has shown the link between violence, fear of violence and psychological stress associated with sex work. [23, 57] Some research has focussed on how the stigmatised nature of working in the sex industry affects women’s mental health. Evidence shows how stigma can cause women to be socially isolated, prevents them talking openly and honestly about their work and limits the opportunities to talk to peers, particularly for street workers and migrant women. [26, 58] Fear of exposure as a sex worker to friends and family and concerns about losing children prevents women from talking to authorities and social services thus limiting opportunities for psychological and emotional support. [25 – 26] In Central and East Europe, police threaten to expose SWs as a method to exert control and extort money. [25 – 26]

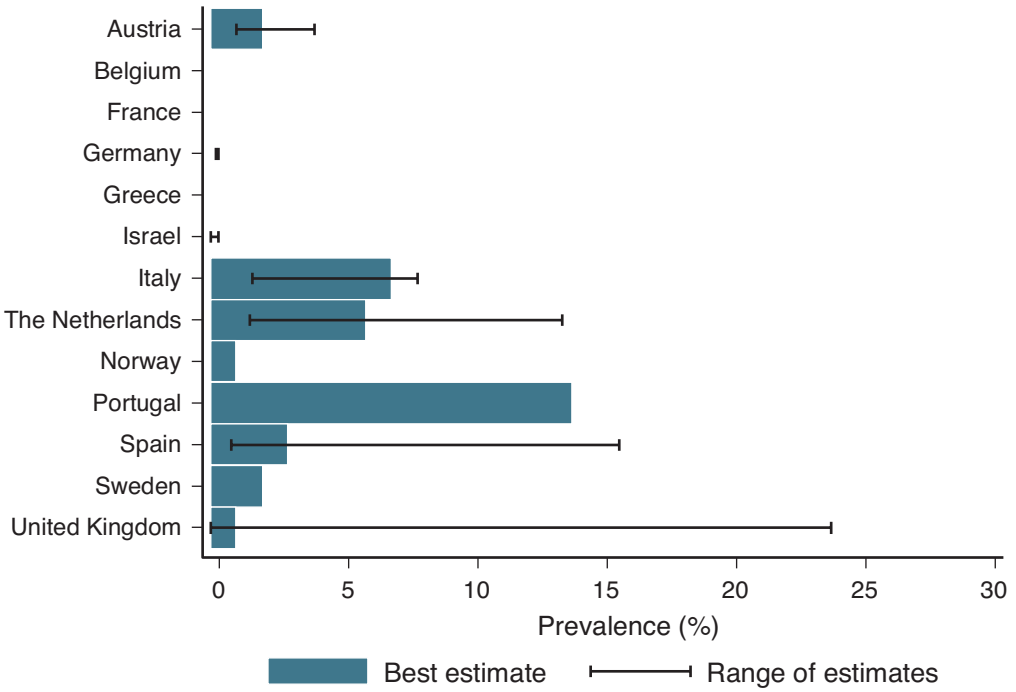
Some studies have found that psychological and emotional risks were of greater significance than safety risks as women feel less able to control the former [59] and while the risk of violence ends after work, the psychological impact continues. [60]

Drug-using sex workers are doubly stigmatised and any mental health issues may be compounded by neglect of basic health needs such as diet, adequate sleep, as well as lack of permanent accommodation and increased vulnerability to violence. [25 – 26] In some countries of the FSU registration as a drug user provides sufficient grounds for authorities to remove new-born babies and children from female PWID. [37] Qualitative studies in Ireland showed how drug use helped women manage the stress associated with sex work, but at the same time made them more prone to violence or sexual risk behaviours. These studies highlighted the frequency of mental health issues (depression and suicide attempts) among street-working women. [61] [62] A study in Switzerland suggested that mental health problems (defined as a range of disorders) were associated with working location and being a migrant. [63]

3.2.3 HIV prevalence

HIV prevalence among sex workers in Western Europe is generally low, with prevalence of 1% or less consistently reported across the sub-region. [4, 9, 20 – 21, 27 – 28, 64 – 69] Prevalence was higher among a sample of sample of SWs in Portugal at 13% and Spain, Netherlands where higher prevalence of injecting drug use was recorded and in Italy and Spain among migrant street and transgender SWs. [19, 65, 70 – 71]

Figure 3.7 'Best' Estimates of HIV prevalence among FSWs in West Europe



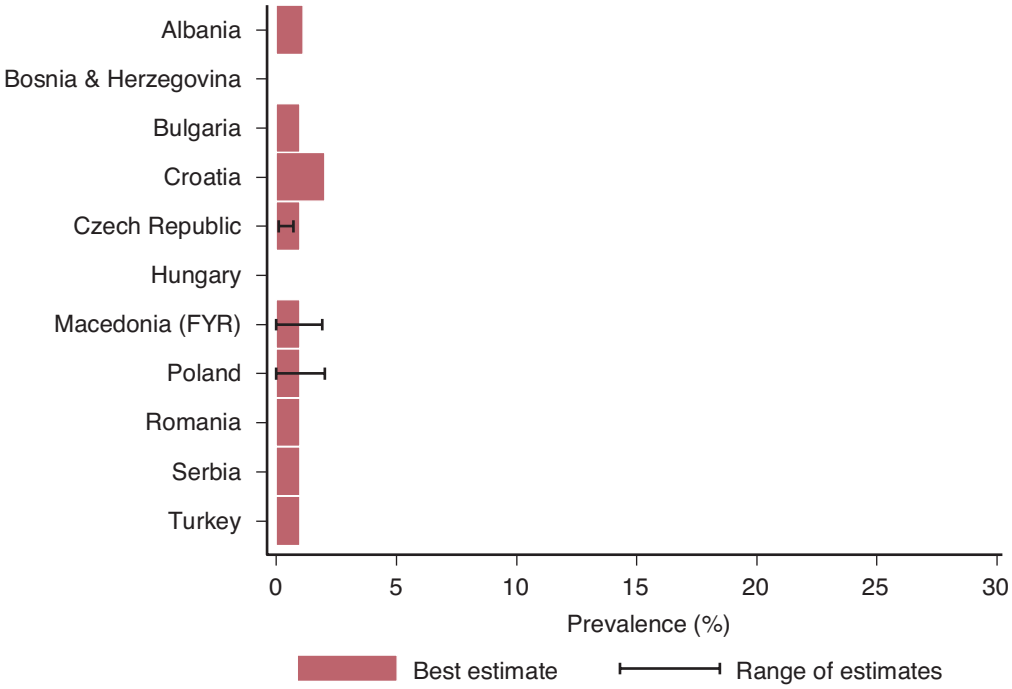
Source: Appendix 3.A.12
Note: Some ranges included SWs who inject and transgenders; % = percentage.

Prevalence of HIV is low in countries in Central Europe at less than 1% in Bosnia and Herzegovina, Albania, Bulgaria, Romania, Serbia, Kosovo and the Czech Republic. [17 – 18, 64, 68, 72 – 74] No cases were reported in a sample in Hungary. [64] Prevalence was 2% in Poland and Croatia and between 0 and 1.8% in The former Yugoslav Republic of Macedonia though these studies involved small sample sizes. [68, 75 – 76]

HIV prevalence among sex workers in countries in East Europe is consistently higher than in the West. HIV prevalence ranged between 2.5% and 8% in Azerbaijan (Baku), [33, 77] 4.6% in the Republic of Moldova (Chisinau), [33] and 7.6% in Estonia (Tallinn). [36] A lower prevalence was reported in Georgia and Armenia at less than 2% [68, 78] and 0% in Lithuania and Belarus. [68, 79] A higher prevalence was reported in 2009 in Minsk (Belarus) of 6.4%, where 15.5% of the sample reported injecting. [80] In both

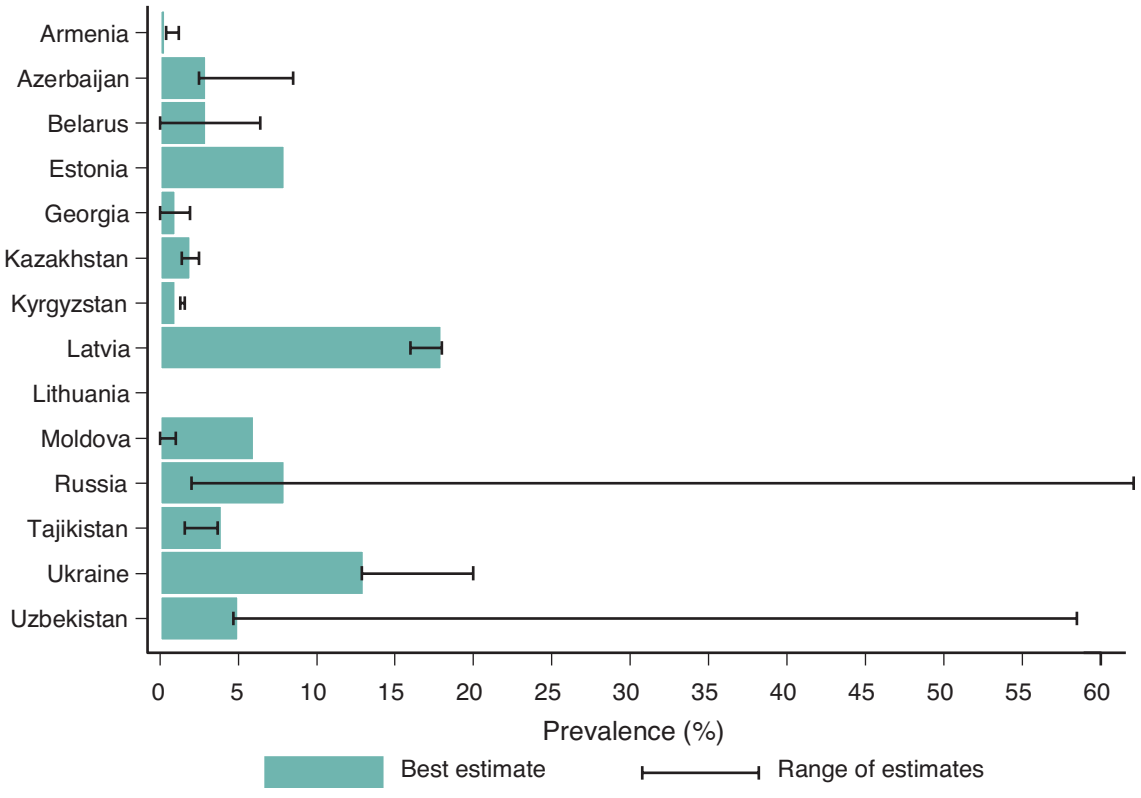
the Russian Federation and the Ukraine, prevalence varied by city ranging from 2% to 60% in the Russian Federation and between zero in Uzhgorod, Kharkov and Chernitz and 42% in Donetsk, Ukraine (see Figure 3.9 below) suggesting outbreaks remain contained at a city level. In the Ukraine, prevalence ranged). [24, 81 – 82]

Figure 3.8 'Best' Estimates of HIV prevalence among FSWs in Central Europe



Source: Appendix 3.A.13.
Note: Some ranges included SWs who inject; % = percentage.

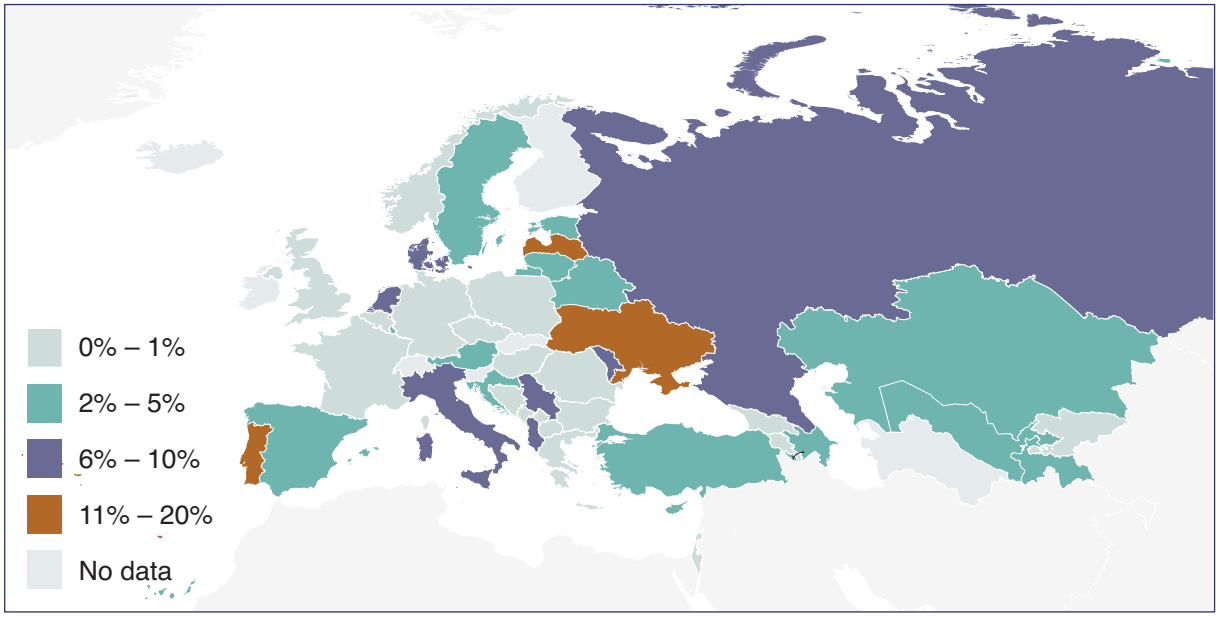
Figure 3.9 'Best' Estimates of HIV prevalence among FSWs in East Europe



Source: Appendix 3.A.14.
Note: Some ranges included SWs who inject ; % = percentage.

Figure 3.10 presents the best estimates of HIV prevalence among FSWs from each country. The HIV epidemic among FSWs is characterised as a low level epidemic in the majority of countries in the West and Centre, with the exception of Spain, which has a medium-level epidemic and Portugal and Italy, which is characterised as high. The majority of countries in the East are characterised by high-level epidemics, with the exception of the Central Asian Republics where the epidemic is medium level. This is explored in more detail in Case Study 3.3 below.

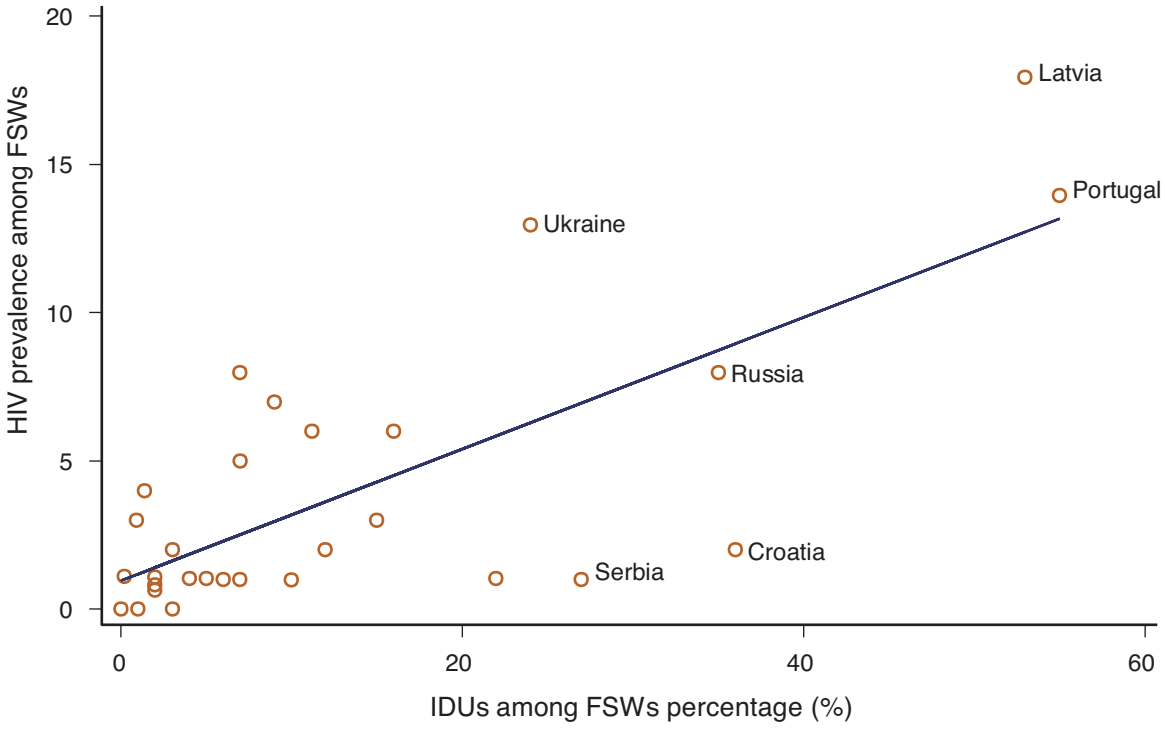
Figure 3.10 'Best' estimates of HIV prevalence among FSWs across Europe



Source: Appendix 3.A.12 – 15.

HIV and injecting drug use

Figure 3.11 The relationship between HIV and injecting drug use among FSWs

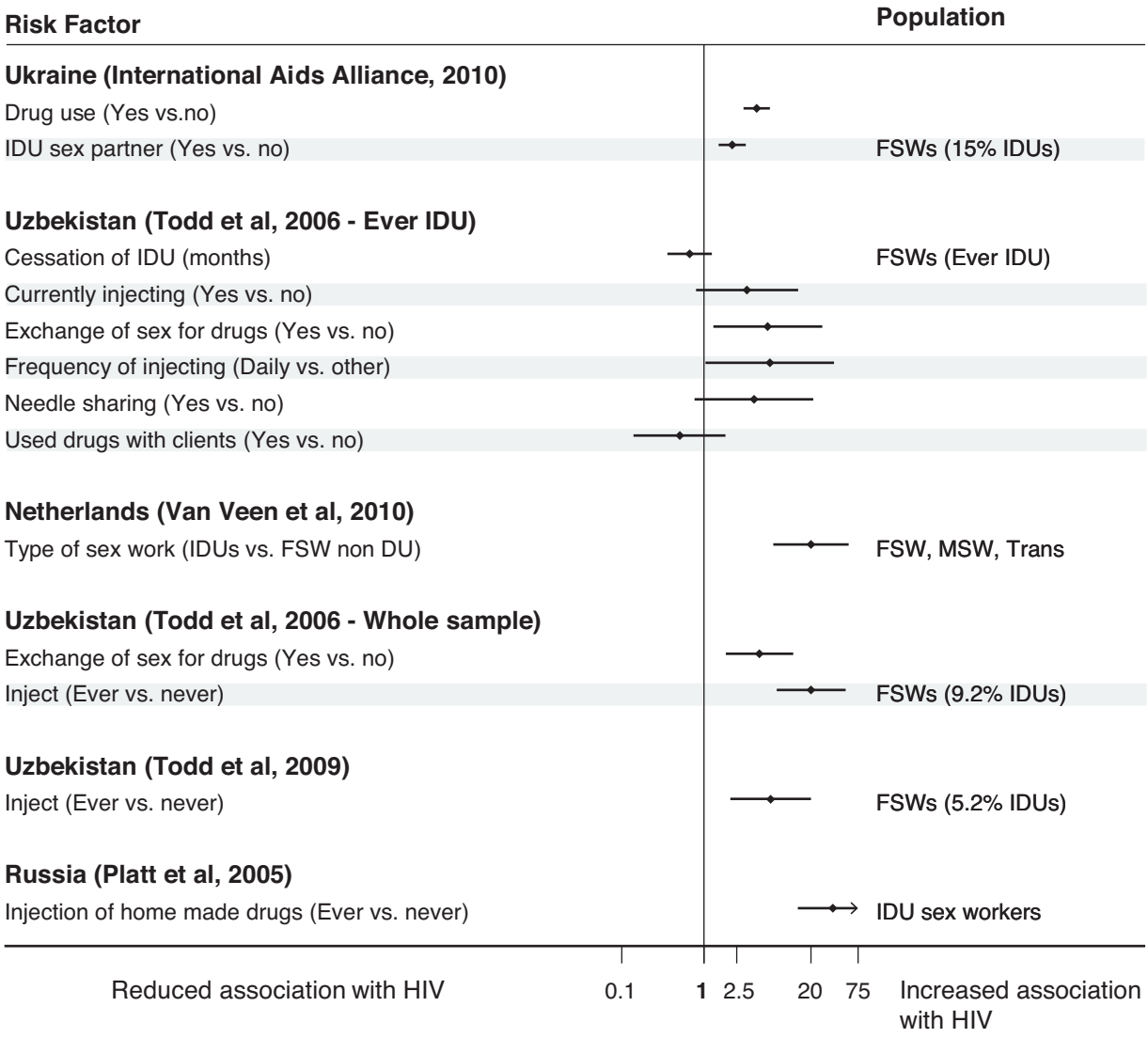


Source: Appendix 3.A.12 – 14.
Note: FSW = female sex worker.

There is a clear relationship between HIV and injecting drug use across the region. Where prevalence of injecting drug use is higher, so is HIV. In the Netherlands, HIV prevalence was reported to be 5.7% overall and higher among transgender sex workers (18.8%) and female sex workers with a history of drug use (13.6%). [19] In Spain and the United Kingdom small samples of sex workers suggested far higher HIV prevalence of 15% [27] and 4% and 24% among heroin or crack users in London [83] and 13.5% in Portugal compared to people who do not inject drugs. [5] The same patterns occurs in the East, with the exception of Azerbaijan (Baku), the Republic of Moldova (Chisinau) and Estonia (Tallinn) which have high HIV (2.5 – 8%) despite relatively lower levels of injecting drug use (<10). [33, 36, 77]

Studies conducted in the Netherlands, the Ukraine, Uzbekistan and the United Kingdom,[4] examining risk factors for HIV among SWs show more evidence of increased risk of HIV associated with injecting drug use. [19, 84 – 86] Among FSWs currently injecting drugs, risk of HIV is higher among those reporting specifically selling sex for drugs and injecting daily [87] and, among those injecting home-made drugs in the Russian Federation. [13] In the Ukraine, having a sex partner who was also injects drugs was associated with increased risk of HIV. [24]

Figure 3.12 Adjusted effect estimates of HIV with injecting risk behaviours among SWs



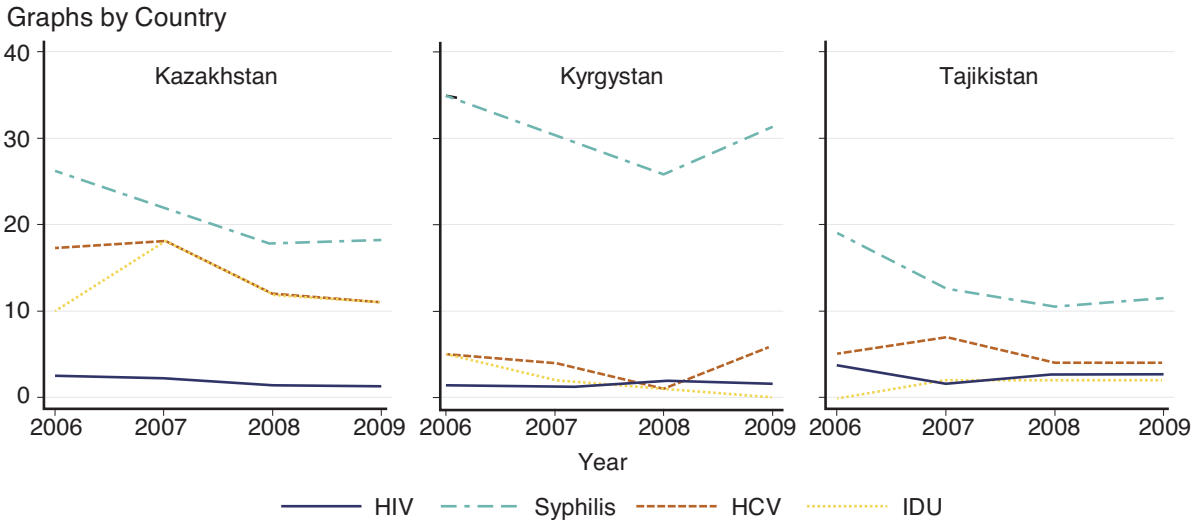
Note: SW = sex worker; FSW = female sex worker; MSW = male sex worker; IDU = injecting drug user.

4 Odds ratios are not presented in the original Sethi et al paper and therefore not presented here.

Case Study 3.3 Central Asian Republics

Serial cross-sectional studies conducted in Kazakhstan, Kyrgyzstan and Tajikistan between 2006 and 2009 [68, 88] suggest that prevalence of HIV remains consistently low at less than 3% in all three countries, but marginally higher in Tajikistan. The proportion of sex workers reporting injecting drug use is higher in Kazakhstan than the other two countries. In Tajikistan the trajectory of HCV reflects levels of injecting drug use in the population. In all countries, prevalence of syphilis is higher than HIV, with some evidence of a decline in prevalence between 2006 and 2008 and then a sharp increase in 2009, this is particularly marked in Kyrgyzstan. Evidence suggests prevalence of HIV is higher in Uzbekistan: at 4.7% among samples of SWs recruited across multiple sites between 2005 and 2007; [89] 6% among female and male sex workers in Samarkand; [85] and in Tashkent HIV prevalence was 10% overall among FSWs but significantly higher among those with experience of injecting (58%) compared to those without (5.2%). [84]

Repeated Prevalence of HIV, Syphilis, HCV and injecting drug use 2006 – 2009



Source: Ongoeva, 2009 Regional AIDS Centre Kyrgystan.
Notes: HCV = hepatitis C virus; IDU = injecting drug user.

3.2.4 HIV among male and transgender sex workers

In West Europe, prevalence of HIV is higher among male and transgender sex workers than FSWs, even where injecting is lower reflecting the higher prevalence of HIV among MSM, the main client group of MSWs. [19, 90 – 91] HIV prevalence is low in the Czech Republic despite higher levels of injecting drug use. [18, 86] Figure 3.13 summarises HIV prevalence estimates among male and transgender sex workers alongside estimates of injecting drug use. Multivariate analysis of risk factors associated with HIV among a diverse group of sex workers (including male, transgender, female drug users and non-drug users) in the Netherlands suggested that odds of HIV were significantly higher among female IDU and transgender sex workers compared to non-drug users. This was adjusted by years in sex work and whether or not anal techniques (defined as insertive or receptive anal sex) were practised with clients. [19] In Spain an analysis that adjusted for age, suggested that risk of HIV was no higher among transvestite or transsexual male sex workers among a sample of male sex workers. [92]

Incidence of HIV and chlamydia

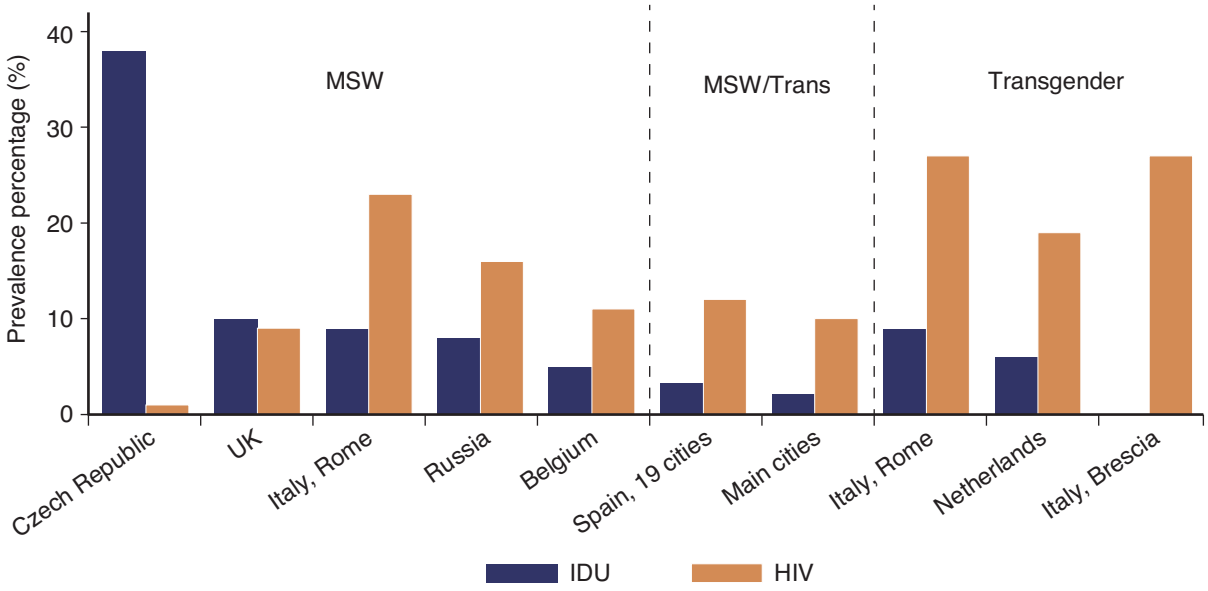
A study of MSWs in London suggested that there were 49 incident cases of HIV over 1309 person years or 3.7 cases per 100 person years. [86] The only significant risk factor associated with seroconversion was first attending the clinic between 1994 and 1996 compared to men attending between 1997 and 1999 or between 2000 and 2003. In Belgium, the incidence of chlamydia was 98 episodes in 1347 person years or an incidence rate of 7.3/100 person years. Baseline prevalence of chlamydia was higher than general population samples in Belgium, the United Kingdom and the Netherlands. [93]

HIV and syphilis

Studies in Spain and Italy show a high prevalence of HIV and syphilis among transgender sex workers from South America, prevalence of syphilis is notably higher in Spain than Italy (Figure 3.14). [65, 90]

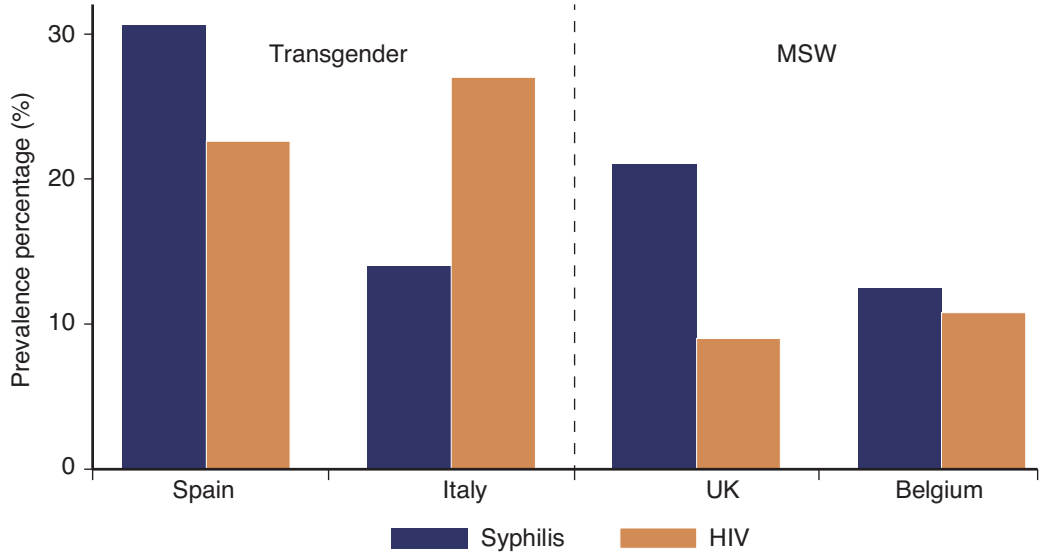
Prevalence of HIV was comparable among male sex workers in the United Kingdom and Belgium, but syphilis was far higher among male sex workers in London, potentially as a result of increased oral sex transmission that had been documented since 2000. [86, 94 – 95]

Figure 3.13 Prevalence of HIV and drug use among male and transgender SWs



Source: Appendix 3.A.15.
Notes: SW = sex worker; MSW = male sex worker; MSW/Trans = male sex worker/transgender; IDU = injecting drug user.

Figure 3.14 Prevalence of HIV and Syphilis among male and transgender SWs



Source: Appendix 3.A.16.
Note: MSW = male sex worker.

3.2.5 Structural factors linked to HIV and STIs

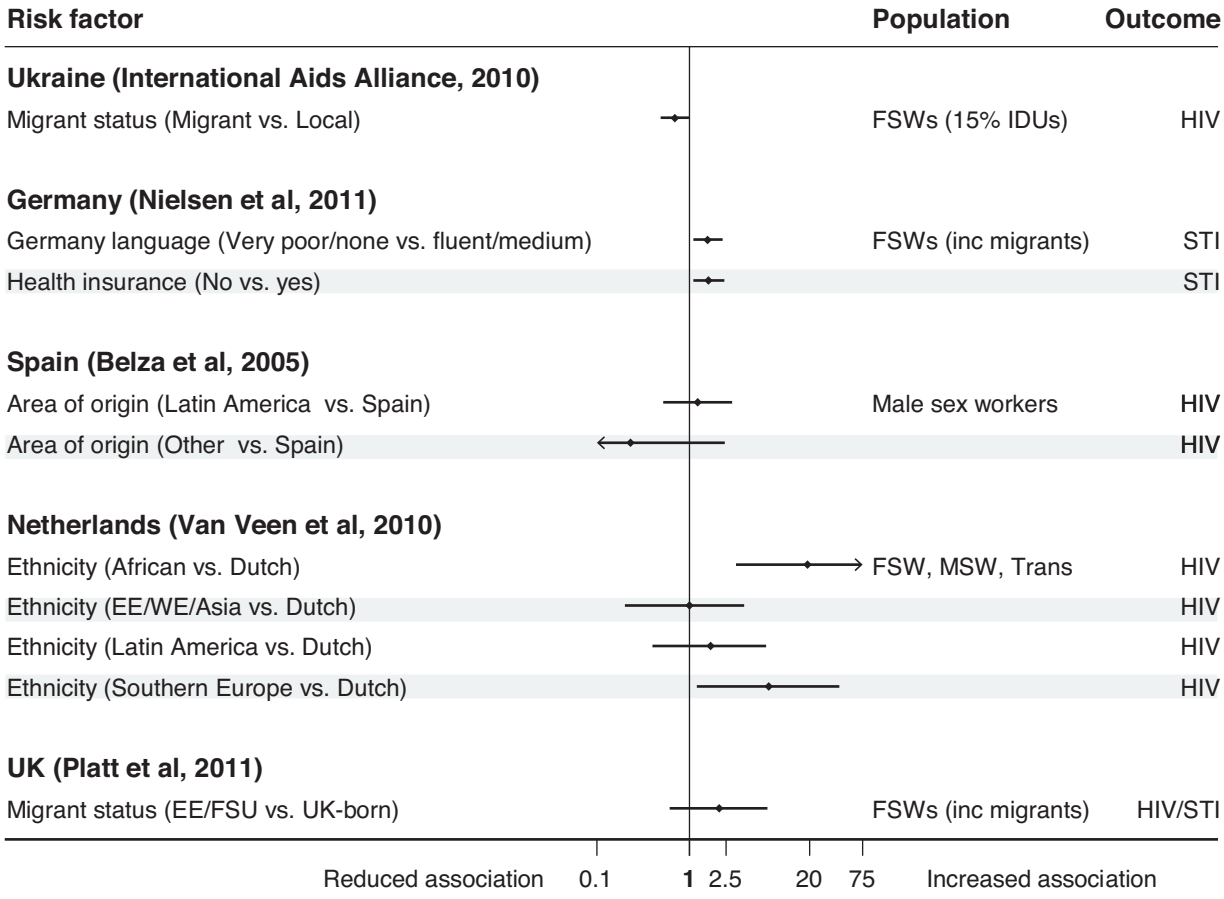
It is clear that while injecting drug use is the main risk factor associated with HIV among FSWs, other structural factors are important in mediating risk of HIV and STIs and vulnerability among sex workers. We examine studies that used multivariate analysis since these adjust for confounding factors to explore the association between risk factors and HIV.

Nationality/migration

Among studies reporting prevalence data only, some evidence showed a higher HIV prevalence among SWs in Spain, which reflected a higher prevalence among migrant sex workers from Sub Saharan African countries and Ecuador (MSWs). [65] A higher prevalence was found among migrant sex workers from

a street-based sample in Palermo and Rome. [71, 91] No data on country of origin or injecting drug use were reported in the latter two studies. Studies that analysed associations between migration and HIV adjusting for confounders suggested that risk of HIV among migrants varied depending on background prevalence of HIV/STIs in the country of origin. [13, 19, 24, 28, 65, 92] Other factors relating to migration were important risk factors for HIV including language skills of migrants and access to health insurance. [19, 69]

Figure 3.15 Adjusted effect estimates of HIV/STI associated with migration among SWs



Notes: Trans = transgender; IDU = injecting drug user; FSW = female sex worker; MSW = male sex worker; EE = Eastern Europe; FSU = former Soviet Union; inc = including.

Health service provision

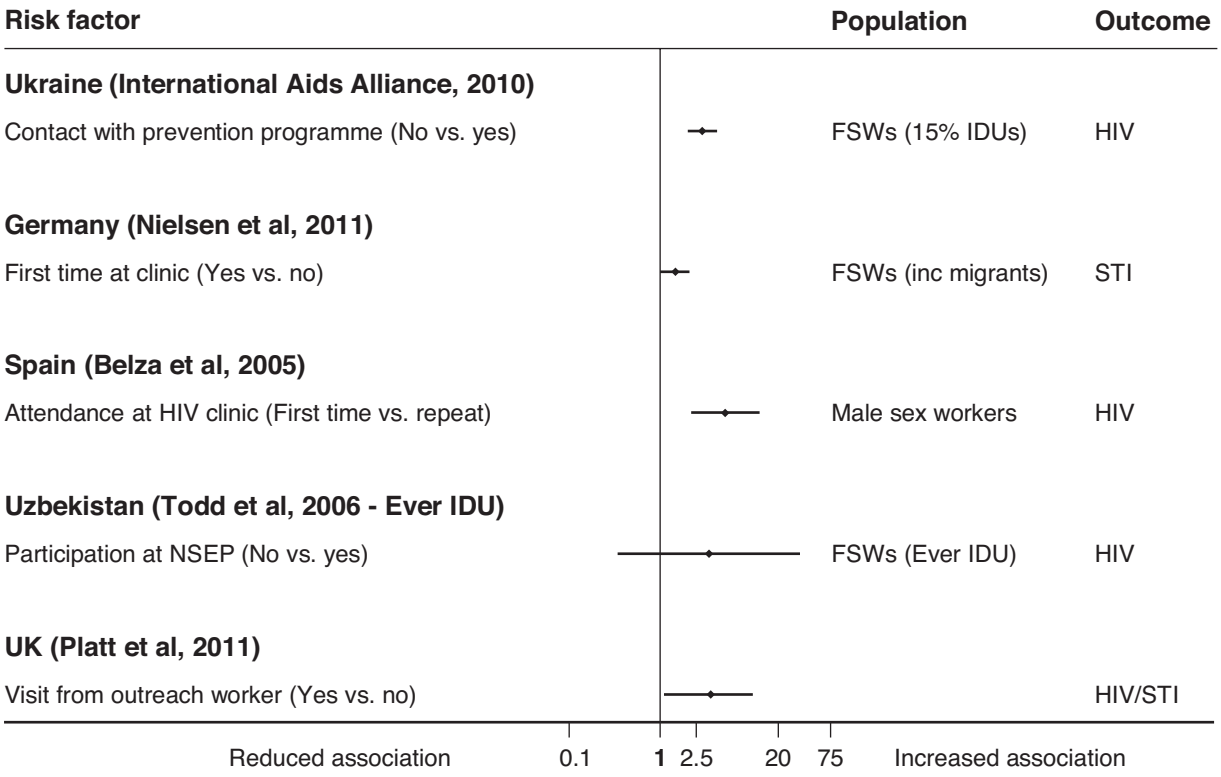
The majority of studies showed that using a health service reduced risk of HIV. The only exception is in Uzbekistan where the relationship between using NSPs and HIV risk was unclear. [84] In London, FSWs with no contact with an outreach worker at their place of work had higher odds of being infected with HIV/STIs. [4] This effect was maintained even after adjusting for screening at an STI clinic in the last six months suggesting that outreach services play an important role in reducing HIV/STIs on top of the advantages provided by fixed site services.

Location of sex work

TAMPEP estimate that just under two thirds of sex workers work off-street in the 25 EU member countries they operate in. They note a shift away from street-work to off-street work since 2003 [3] caused by an increase in the number of migrants as well as policy changes in some countries that criminalise clients and sex workers and specifically target street sex workers. Changes in technology such as the increased use of the internet and mobiles to advertise services have also facilitated off-street work. [3, 24] Street-based sex work is more commonly reported across countries of the FSU as well as the Central Asian Republics and characterised by involvement of criminal gangs, police and a close overlap with injecting drug use. [11, 13 – 14, 52, 88, 96 – 97] Risk factor analyses suggests that risk of HIV or STIs were higher

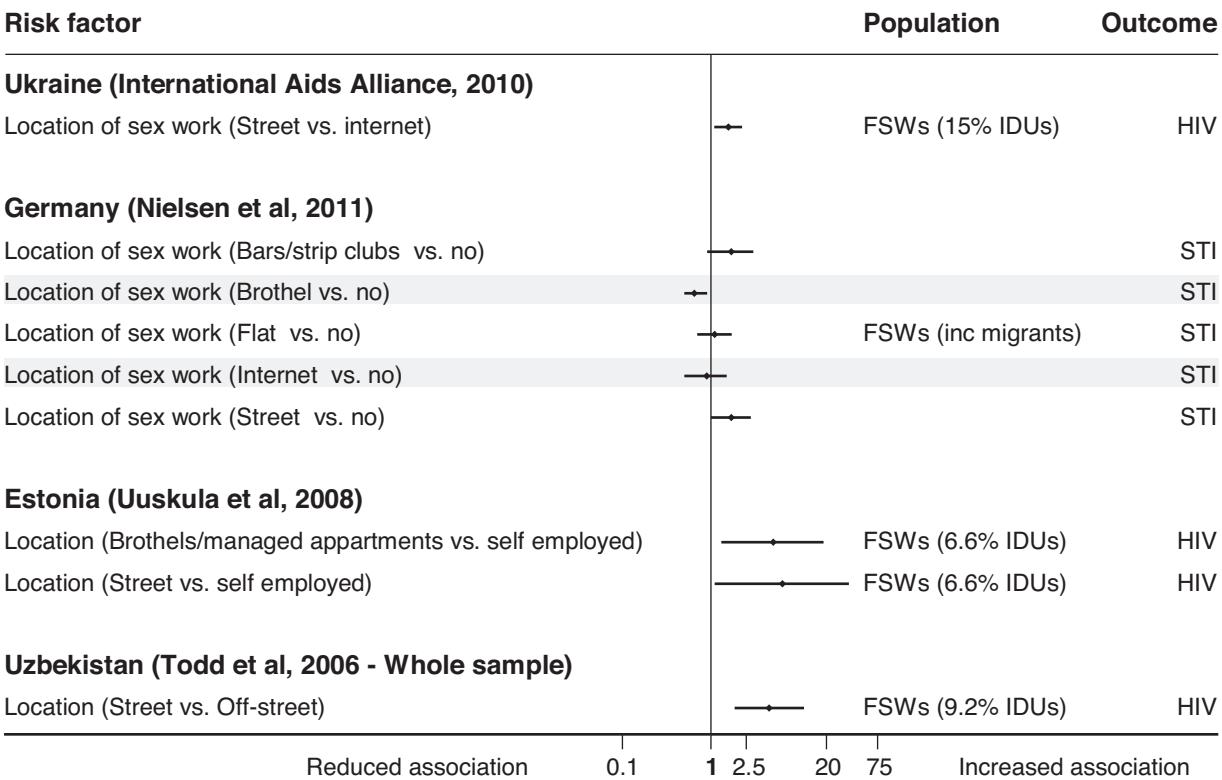
among SWs working on the street in Tallinn (Estonia) and Tashkent (Uzbekistan), Ukraine and Germany [36, 69, 84]

Figure 3.16 Adjusted effect estimates of HIV/STI associated with attending health services



Notes: IDU = injecting drug user; FSW = female sex worker.

Figure 3.17 Adjusted effect estimates of HIV/STI associated with location of sex work



Notes: IDU = injecting drug user; FSW = female sex worker.

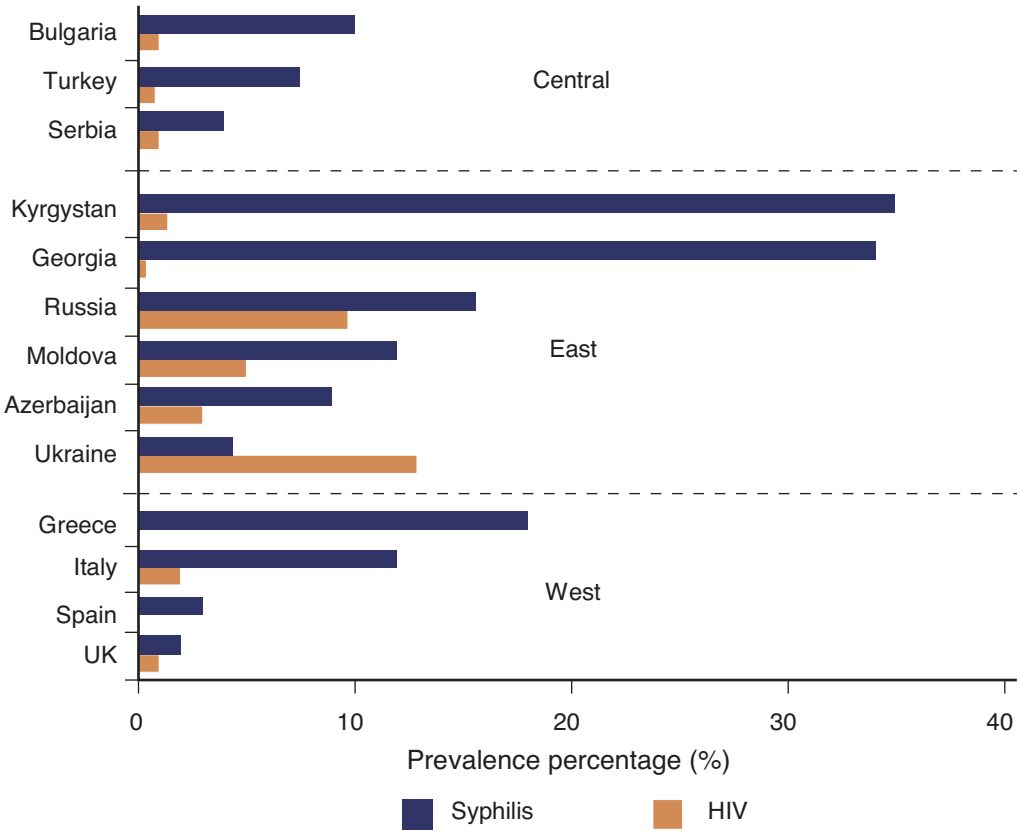
3.2.6 Sexual vulnerability

While HIV prevalence remains low among FSWs who do not inject drugs, it is also harder to transmit HIV sexually than other STIs, specifically gonorrhoea, chlamydia and syphilis. [98 – 99] Below we examine prevalence of syphilis, gonorrhoea and chlamydia to examine the extent of sexual vulnerability among sex workers.

Past and current infection with syphilis

Prevalence of syphilis is highest among samples of FSWs in the East. Across the region, prevalence of syphilis is higher than HIV with the exception of Ukraine, although this varied considerably at a city level (Figure 3.19). In 2001, a high prevalence of syphilis was found among a group of migrant street sex workers in Italy (12%), these cases were among migrants from Eastern European countries (countries not specified) and infection was attributed to past infection at home. [100] In Greece no cases of HIV were found among off-street working sex workers in Athens, but a high prevalence of syphilis was observed (18%). [20] Among this sample 20% were migrants from East Europe but prevalence did not differ by country of origin. In the Russian Federation and the Republic of Moldova the data suggest a concurrent epidemic of syphilis and HIV occurring among samples of sex workers, all the study samples included sex workers who inject drugs. [11, 14] Figure 3.18 summarises selected studies that measured both prevalence of syphilis and HIV among FSWs in Europe. All studies report prevalence of antibodies to T Pallidum and detect current and past infection with syphilis.

Figure 3.18 Prevalence of HIV and syphilis among FSWs across multiple sites in Europe



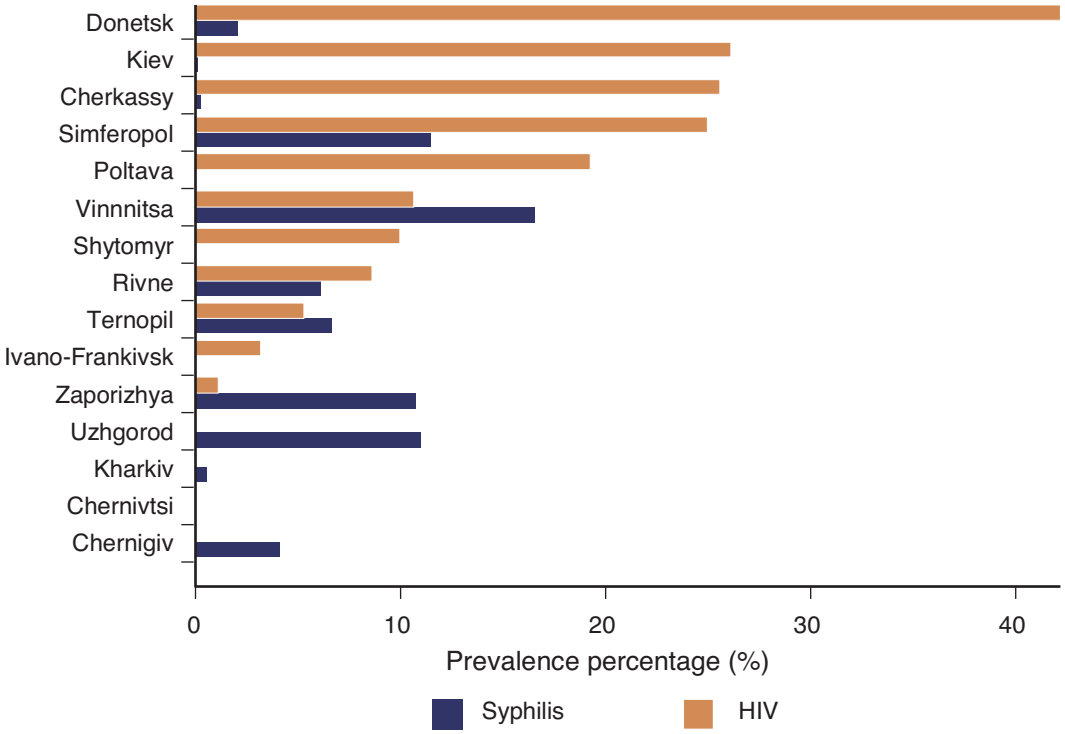
Sources: Appendices 3.A.16 – 3.A.17.

Chlamydia and gonorrhoea

Across countries in West Europe, prevalence of chlamydia remains low at under 7% among FSWs (Figure 3.20). Two older studies in Italy suggested a prevalence of 14% of chlamydia among migrant sex workers [29, 100] and a high prevalence (45%) among off-street and street working sex workers in three cities in Kosovo, this sample was recruited from STI clinics. [17] Prevalence of gonorrhoea is reported at 5% or less across the region, with the exception of Georgia, where a higher prevalence of 12 and 18%

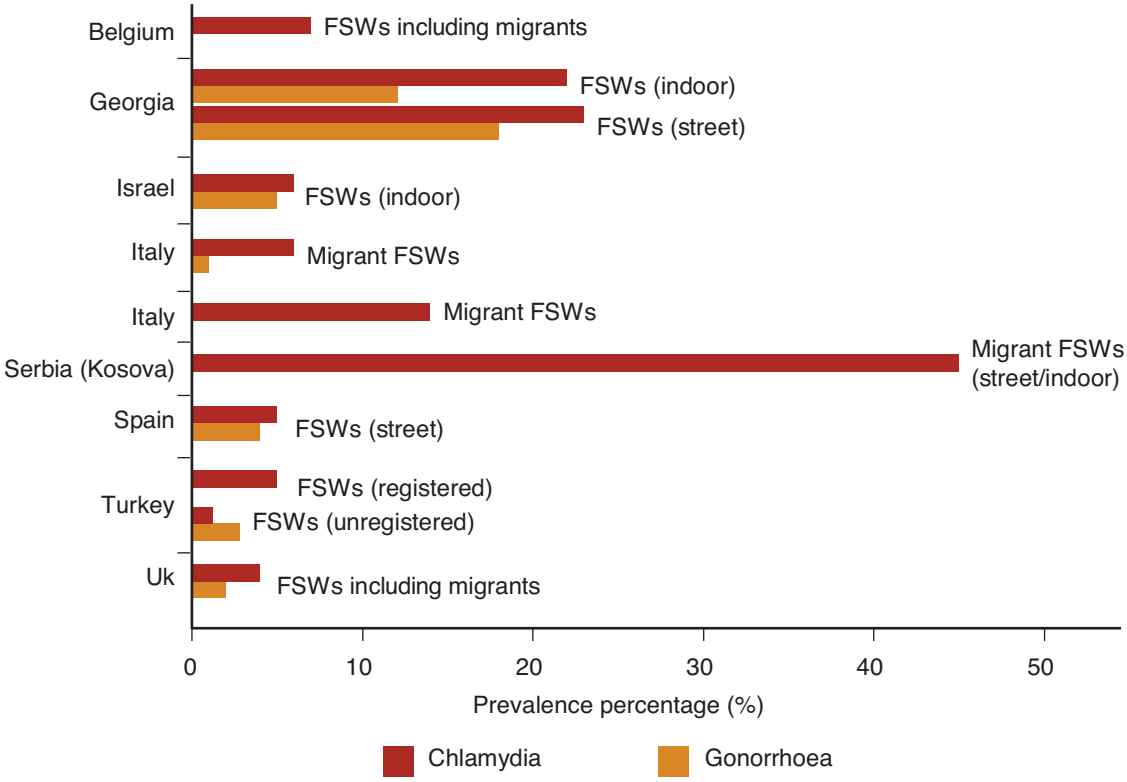
were reported among samples of street and off-street working sex workers and a prevalence of just over 20% of chlamydia. [35, 101] Prevalence of gonorrhoea is between 10 and 100 times higher than in general population samples. [102]

Figure 3.19 Prevalence of HIV and syphilis among FSWs in Ukraine



Source: International AIDS Alliance.

Figure 3.20 Prevalence of Chlamydia and Gonorrhea among SWs in Europe



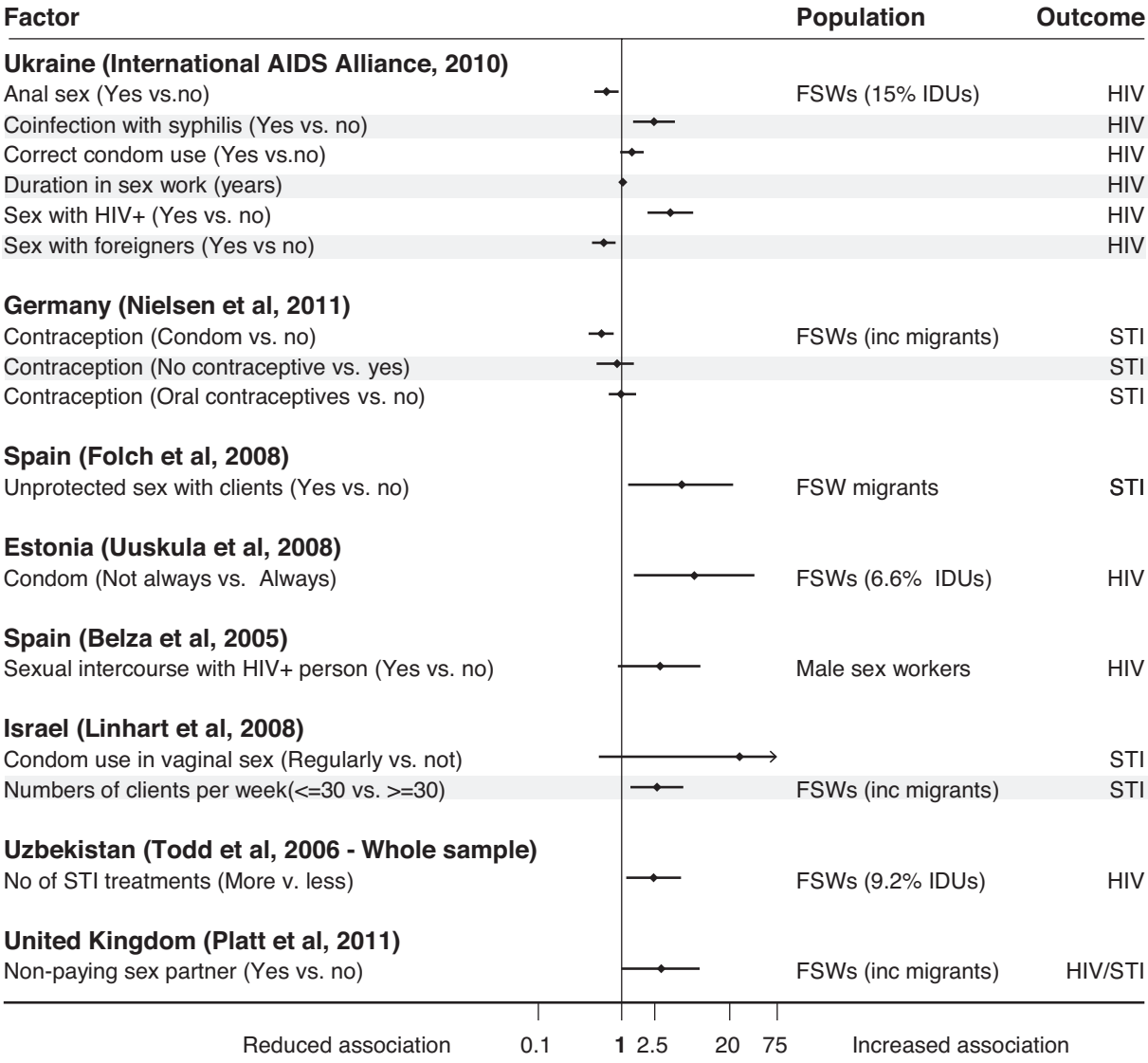
Source: Appendices 3.A.18.
Notes: FSW = female sex worker.

The high prevalence of STIs relative to the general population suggests that SWs remain sexually vulnerable.

Sexual risk behaviours

A few studies showed increased risk related to sexual risk behaviours during sex work. In Spain risk of chlamydia and gonorrhoea was higher among SWs having unprotected sex with clients [28] and risk of a single or co-infection with gonorrhoea, chlamydia or active syphilis were higher among those reporting more than 30 clients a week and not regularly using a condom for vaginal intercourse. [66] A study in Estonia suggested, counter-intuitively, that consistent condom use was associated with increased odds of HIV, most likely as a result of misclassification or underreporting or as a result of women made aware of their HIV status modifying their behaviour to use condoms more frequently.

Figure 3.21 Adjusted effect estimates of HIV/STI associated with sexual health



Notes: FSW = femaile sex worker; IDU = injecting drug user; STI = sexually transmitted infections; inc = including.

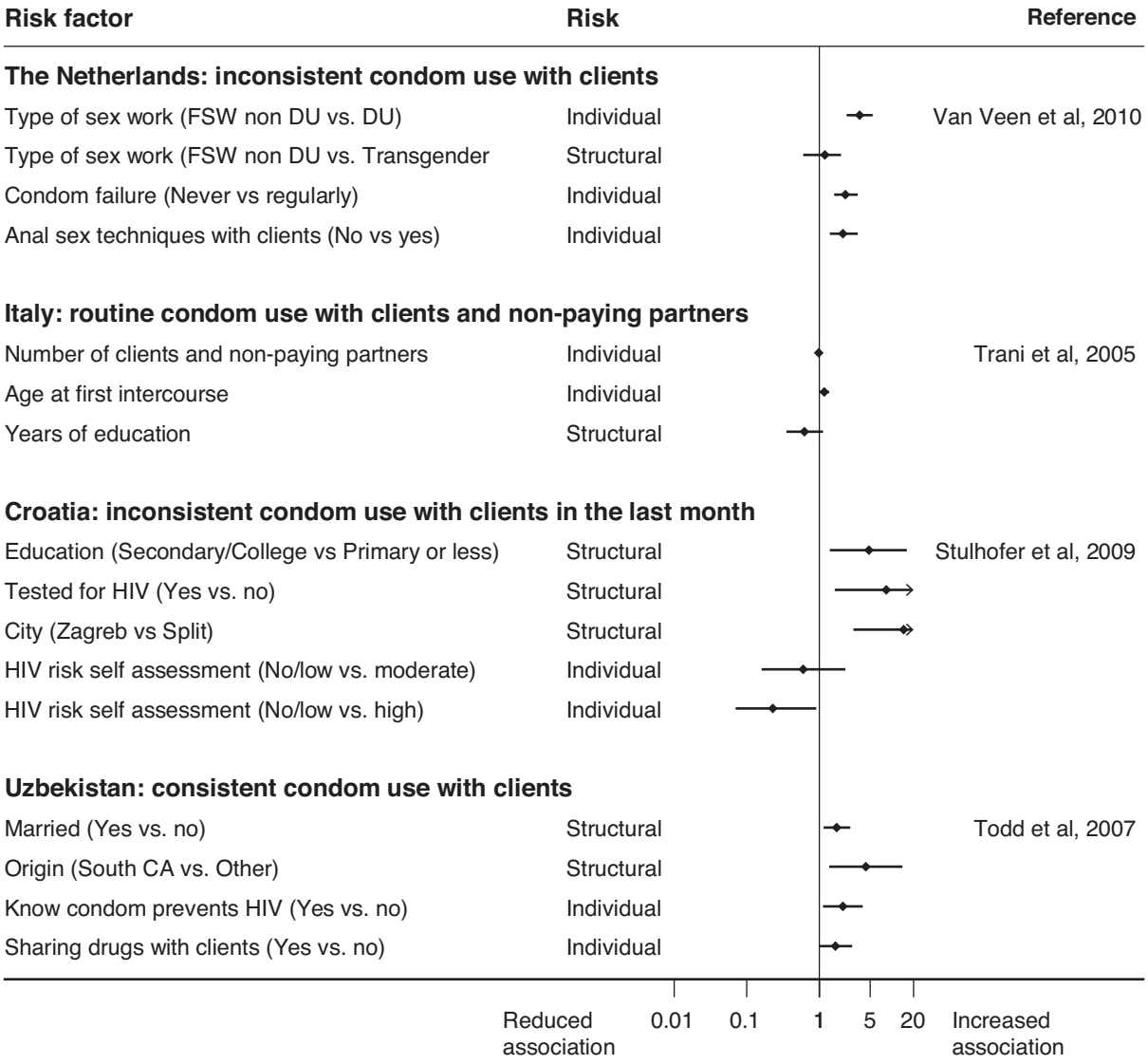
Condom use with clients

Behavioural data from our systematic review suggested regional differences in condom use with clients: use was consistently higher among samples of sex workers in West Europe (<17% reported inconsistent condom use with clients) compared to those in the East (0 – 78% inconsistent use) and Central

European countries (ranging between 5 and 38% inconsistent condom use). Evidence suggests the interplay between drug use and sex work in condom use: sex workers who use drugs are less likely to use condoms than non-injecting SWS; and injecting drug users who sell sex are less likely to use condoms than their non –sex working counterparts. [13, 25] In the West, lower levels of condom use with clients were reported among samples of sex workers who used drugs in London and the Netherlands, as well among transgender sex workers. [6, 19, 25] Differences in condom use by gender were observed in a study of migrant sex workers in Rome: male and transgender sex workers were less likely to report condom use with clients than females. [91] However condom use among MSWs with clients is high, with inconsistent condom use reported by <25% in the Netherlands [19] and Italy. [90 – 91]

Reasons for not using condoms were generally economically motivated, but pressure from clients was also reported in both Central and Eastern European countries as well as from qualitative data from studies in Ireland and the United Kingdom. [61, 103] Concerns about condom breakages are also a factor as illustrated by a study from the Netherlands. [19] Data suggest that condom breakage can occur in up to 5% of use and is associated with incorrect application. [104 – 105] Policing practices such as the confiscation of condoms as evidence of sex work was reported as a disincentive for carrying condoms and therefore limiting opportunities for their use. [50, 56]

Figure 3.22 Adjusted effect estimates of condom use among SWs in Europe



Notes: DU = drug user; FSW = female sex worker.

Condom use with non-paying sex partners

Across all the countries condom use with non-paying partners was less common than with clients. Qualitative data has shown how condoms are used as barriers to STIs and also as a barrier to intimacy, with women opting not to use condoms with boyfriends and non-paying partner in order to clearly demarcate sex for work and sex in their personal lives. [59] Condom use for anal sex was the norm among MSWs in London for commercial sex but 37% reported not using condoms for anal sex with regular partners (Appendix 3.A.19). [86]

Risk factors associated with unprotected sexual intercourse

We identified four studies that examined risk factors associated with unprotected sexual intercourse measured by consistency or inconsistency of condom use (Figure 3.22). [7, 19, 54, 106] Inconsistent condom use was associated with lower education, not being tested for HIV, more clients and non-paying partners. [7, 54] Drug users were less likely to use condoms in the Netherlands and people experiencing regular condom failure or practicing anal sex techniques with clients (receptive or insertive sex). [19] More consistent condom use was associated with being married, a migrant and among those who considered themselves at higher risk of HIV infection. [54, 106] Greater knowledge of HIV transmission routes was associated with more consistent condom use as was not sharing drugs with clients. [106]

3.2.7 Concluding comment

The systematic review demonstrates that HIV remains low among female sex workers who do not inject drugs, (<1%) but high among FSWs who inject drugs (>10%) and male and transgender sex workers. Structural risk factors associated with HIV among SWs included lack of contact with outreach and HIV/STI services, working on the street and originating from a country with a high HIV prevalence. SWs remain sexually vulnerable as the high prevalence of gonorrhoea demonstrates and highly vulnerable to physical and sexual violence from clients, non-paying partners and police.

3.3 Men Who Have Sex With Men

Men who have sex with men (MSM) are primarily at risk of HIV infection through unprotected anal intercourse (UAI). The estimated per-contact risk of acquiring HIV through receptive UAI with a known HIV positive partner is 1-in-70 sexual contacts for a receptive partner (with ejaculation) and 1-in-909 for the insertive partner. [1] The risk of transmission for oral sex is low: one study determined it to be zero; [2] while another calculated it to be 1 in 2,500. [3]

3.3.1 Demographic characteristics

Below we describe the characteristics of the men sampled by the studies reviewed (see Appendix 3.A.24 – 26). As many studies were undertaken in relatively high-prevalence settings including cities with noted 'gay communities', and with recruitment often undertaken in gay venues or health care settings, survey findings may not be generalisable beyond such settings. This may mean that younger men, and those more socially and maybe sexually active, are overrepresented, whereas men who are not as community-engaged may be underrepresented.

Age

In the West, the median age of MSM participating in studies was between 28 and 33 years. In central Europe, the median age is slightly lower, between 25 and 30 years, with mean age ranging between 26 and 29. In Eastern Europe the age range was very similar to the Centre, medians ranging from 24 (in Kyrgyzstan) to 30 (in Estonia), and the mean age around 28 years, a little more than 10 years younger than the mean age of respondents in the West.

Education

In the West, respondents tended to be highly educated; between 38% and 58% had university degrees or higher levels of education, with a minority (9% – 21%) reporting no qualifications. In the Centre, a lower proportion of MSM had degrees ranging between 27% and 39% and in Hungary the mean number of

years spent in education was 15.3. In Turkey, although 58% reported having a degree, 5% had no qualifications, and 11% reported finishing only primary school indicating considerable educational heterogeneity in the levels achieved by respondents. In the East, between 51% – 56% completed post-secondary education; this could include academic or more vocational training. Between 5% – 17% only reported not having completed secondary education.

Occupation and income

In the West, studies from Spain and the United Kingdom suggest that between 73% – 84% of MSMS are in employment and between 5% – 20% of respondents are students. Unemployment ranges from 5% – 18% in some studies. Only one study in the review reported levels of employment in the Centre. This was in Hungary and it reported similar levels of employment: 61% in "white collar" jobs; 16% in "blue collar" jobs; and 50% studying, at least part time. In the East the story varies a little more. Studies from Estonia and the Russian Federation indicate high levels of employment, 66% in Estonia reporting an annual salary of over USD 750. In Central Asia the median incomes report are lower: USD 324 in Kazakhstan and USD 114 in Kyrgyzstan, with 8% – 13% having no income at all and 4% – 18% no certain occupation. This may reflect national level employment patterns rather than characteristics of the MSM community itself.

Nationality or ethnicity

The majority of MSM samples included in the systematic review originated from the country in which the research took place, with a small proportion of migrants sampled. In Spain between 20 – 24% of respondents were migrants, principally from Latin America (9 – 12%) and other parts of Europe (4 – 7%), [4 – 6] the exception being a study recruiting from sex worker apartments in Valencia where nearly 80% of respondents were Latin American [7] Swiss studies recruited a small proportion of migrants (16 – 17%) from other European countries. [8, 9] Dutch and British studies recruited a smaller proportion of migrants (17 – 13% and 4 – 15% respectively), and 10% were reported in Israel, however some of the Dutch studies were limited to respondents who could speak and write in Dutch. [10 – 17] Few studies in the Centre examined the country of origin of respondents. A study in Turkey, for instance, included 7% migrants. [18] In the East, migrants tended to originate from other countries in that region. One study in Estonia recruited 21% ethnic Russian and 8% of other origins. [19] Similarly, a Georgian study found that 17% of respondents were non-nationals, including 4% ethnic Armenian, 4% ethnic Russian and 9% from elsewhere. A study of MSWs in Moscow reported 38% of respondents not originating from the Russian Federation. [20]

3.3.2 Risk practices

Drug and alcohol use

Alcohol and drug use are frequently reported among MSM in the review. This may in part reflect bias associated with recruiting participants in gay venues where alcohol and drugs are available. The papers described here highlight recreational use, though detailed information on amount or frequency of use was lacking. In the West, alcohol use is most common with only 1 in every ten men abstaining from alcohol. [15] In the past 12 months in Spain, 64% of respondents report having taken alcohol before or during sex as do 54% of respondents in Italy, 54%. [6, 21] Amyl-nitrate or 'Poppers' are the next most common drug, with 41% reporting having taken them in Spain in the last 12 months either before or during sex, [6] and up to 80% having taken them in the United Kingdom in past two years. Poppers are favoured by MSM since they have a side effect of relaxing the anal sphincter muscle and so facilitating anal sex. [15] While the Spanish and Italian studies show other drugs being used at relatively low levels (<20%), studies from the United Kingdom show high levels of ecstasy use (44 – 67%), cocaine (46 – 59%), ketamine (3 – 55%), Viagra (33 – 53%), speed (18 – 25%) and GHB (17 – 25%) in the past two years, as well as lesser amounts of other drugs. [15]

Several studies in the Centre address alcohol and drug use among respondents. As in the West, Europe, alcohol is most popular, between 47 – 85% having drunk before or during sex in the past six months. [17, 21] A study in Hungary and the Russian Federation reported that 96% of respondents had drunk in the past month (not disaggregated by country). [22] Proportionally fewer (42%) respondents in Albania

drank daily. [23] Poppers were also common, between 21 – 70% had used them recently. [17, 21] Cannabis use was reported by 24% of respondents in Israel, in comparison to between 10 and 20% in most other countries. Other drugs used were similar to those reported in Western Europe.

In the East, alcohol use was again high, with 86 – 96% having used it in the past month, [22, 24] and between 4 – 8% reporting daily drinking. [19, 22, 24, 25] 89% in Georgia reported marijuana use and 22% buprenorphine, however drug use was not explored further.

Buying and selling sex

Few data were found in the studies from Western Europe on frequency of sex work, however a study from Catalonia, Spain found that 4.1% of respondents had charged for sex. [6] Another Spanish study in Valencia, included participants from "prostitution apartments", no information was provided on the frequency of this practice, respondents recruited from these apartments tended to be younger, migrants, and more likely to have had an HIV test than the reference group recruited from saunas. [4]

A study from Tirana, Albania reported that 74% of respondents had AI with a commercial partner in the previous six months, although the proportions buying and selling were not clear. [23] In Croatia, 5% reported ever having sold sex. [26] In Israel, 11% reported having paid for sex. [17] Sex work was more common among the respondents in the Turkish samples, 44% having sold sex, both as insertive and receptive partner, with more than one partner; 37% reported taking the receptive role only and 16% the insertive. [18] Three studies in Eastern Europe addressed the question of commercial sex: 21% reported having sold sex in the past year; 16% had paid for sex in the past 12 months in the Russian Federation; and 21% in Ukraine in the last 6 months. [22, 24]

A man's relationship with sex work may change over time, with younger cohorts trading sex with older, richer cohorts. A qualitative study suggests that receiving payment in kind such as drinks, rent, accommodation or presents from their partners is come among Balkan MSM. [27] This study found also that where sex is usually transactional, partner change rates tend to be higher, a tendency which also correlates inversely with age across Bulgaria, Kosovo, The former Yugoslav Republic of Macedonia and Romania, and noted that in a commercial encounter between men, it is the buyer who will dictate the terms of the sexual contact, including: type of sex act; who takes the insertive or receptive role; and condom use. Other studies confirm that decisions on condom use are made by clients in the Russian Federation and Georgia. [28, 29]

3.3.3 Prevalence and incidence of HIV and STIs among MSM

We identified HIV prevalence data measured using biological samples in 33 countries and through self-report in 38 countries (see Figure 3.23 to Figure 3.27). Comparisons should be interpreted with caution due to the range of recruitment methods and settings as well as limitations associated with self-reported data. It should be noted that while 'gay venues' generally refer to places which cater predominantly to self-identifying gay and bisexual men, these may be context specific and vary considerably across countries and even within cities.

Self-reported diagnosed HIV prevalence

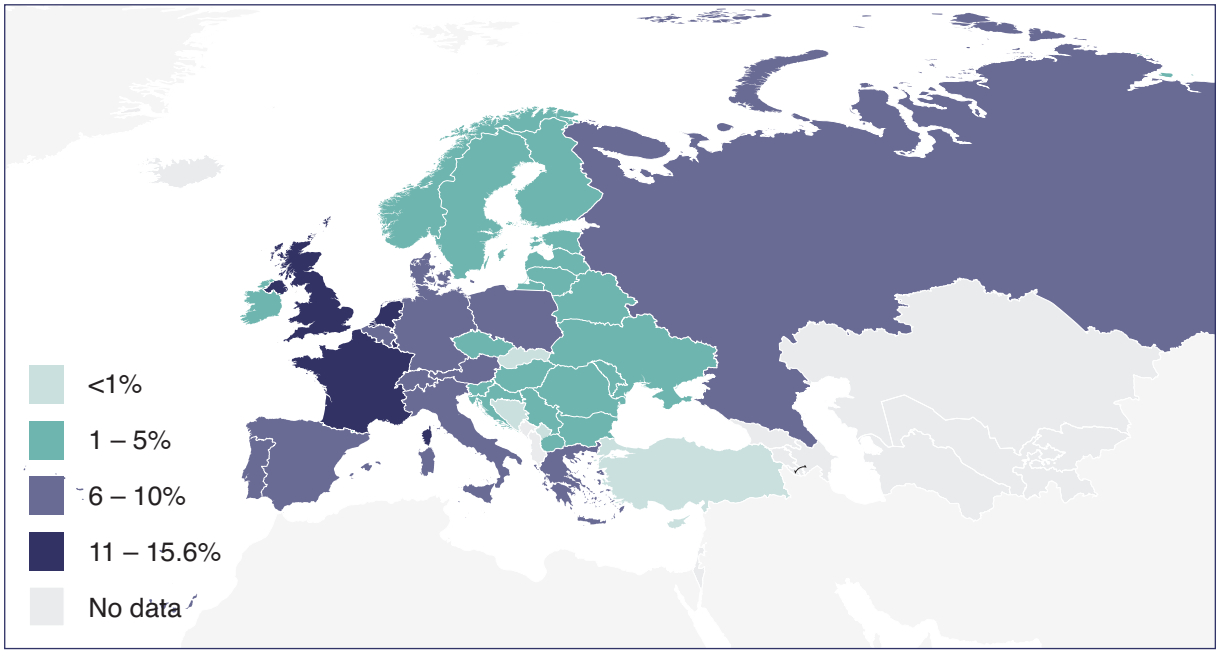
Self-reported HIV prevalence collected in 38 countries through the European Men's Internet Survey (EMIS) varied from below 1% in Bosnia and Herzegovina to over 15% in the Netherlands (Figure 3.23). [30] Absolute sample sizes ranged from 123 in Malta and The former Yugoslav Republic of Macedonia to over 55,000 in Germany. This translated to a response rate of 0.28 per 10,000 total population in Turkey to 6.82 per 10,000 total population in Germany. For the sake of accuracy and consistency, self-reported HIV prevalence estimates have been excluded from the results presented here.

HIV prevalence and incidence studies using biological samples among MSM

Our systematic review identified 65 sources containing HIV prevalence or incidence data among MSM in Europe, of which 55 were unique. 22 papers were in Western Europe, 19 reporting prevalence, and three

reporting HIV incidence, [11, 12, 31] 14 were in Central Europe [18, 23, 32 – 43] and 14 in Eastern Eu [103, 105 – 106, 275, 278, 283, 285, 297 – 308] rope, [20, 44 – 56] as well as 2 regional [57, 58] and three multi-county sources. [21, 22, 59]

Figure 3.23 Self reported HIV prevalence among MSM in Europe, European MSM Internet Survey



Source: Reference. [30]

Evidence suggests that HIV incidence was 1.3 per 100 person years among a cohort in Amsterdam recruited between 1995 and 2002, with little increase from those recruited prior to 1995 (1.1). However, significant increases in incidence of syphilis (0 – 1.4 per 100 person years) and gonorrhoea (1.1 – 6.0 per 100 person years) were recorded. [11] Another study in Amsterdam reported Increased incidence among MSM attending an STI clinic between 1999 – 2005, the estimated incidence was 3.8 per 100 person years and associated with older men (≥35 years). [12] In Rome a retrospective cohort study of men recruited at an STI clinic showed incident rate to be 5.0 per 100 person years between 2000 and 2003 and a significant increase in HIV cumulative incidence in comparison with the period 1984–1995 (incidence rate ratio 2.20, $P < 0.001$). [31]

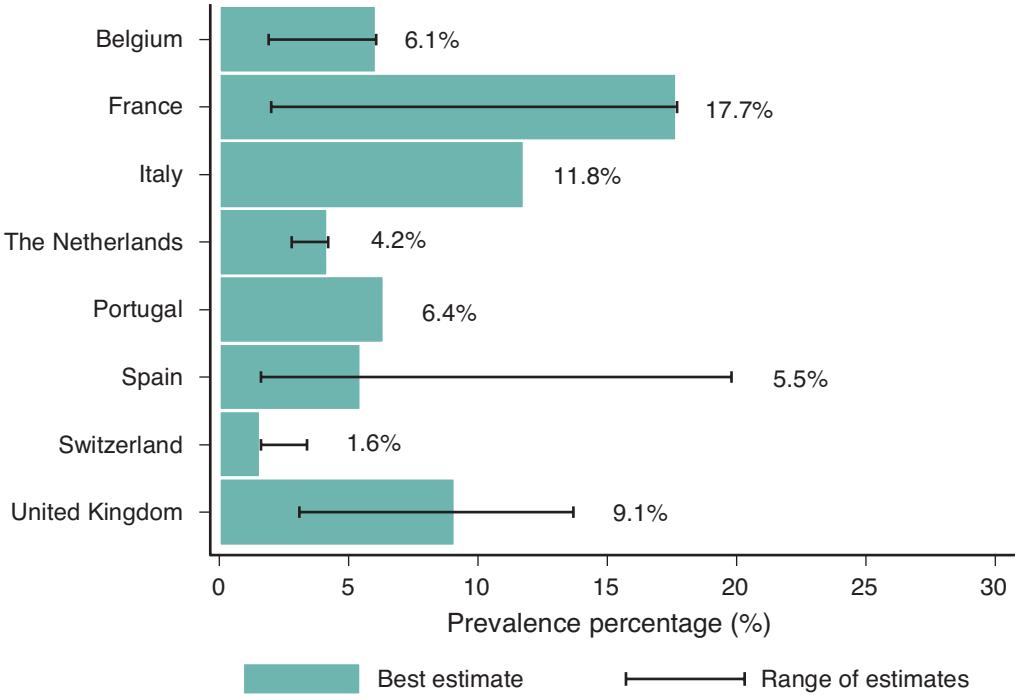
HIV prevalence among MSM in Europe varies from below 1% in Bosnia and Herzegovina [33] and Kazakhstan [50] up to nearly 20% in France. [60] In some countries, the Netherlands, Switzerland and France for example, the self-reported HIV prevalence exceeds the prevalence estimated through biological testing, although in others, for example, Spain and the United Kingdom, the multiple samples produce comparable results. These differences may reflect the different characteristics of the populations sampled.

Best estimates of HIV prevalence among MSM

With a wide variety of estimates from a wide range of bio-behavioural studies of variable quality, it is challenging to draw conclusions about the state of the epidemic among MSM in Europe. To allow for better comparison of HIV prevalence across the region we selected the “best” estimates available to us for comparison, these are presented in Figure 3.24 to Figure 3.26, alongside the range of estimates reported where more than one estimate was identified.

In the West, eight countries had HIV prevalence estimates from bio-behavioural surveys (Figure 3.24). Prevalence among MSM was generally highest among countries in this sub-region with recent estimates ranging from as low as 1.6% in a sauna-based sample in Valencia, Spain [4] and anonymous VCT clinics in Switzerland [9] up to nearly 20% in several community studies from Barcelona and Catalonia. [21, 61]

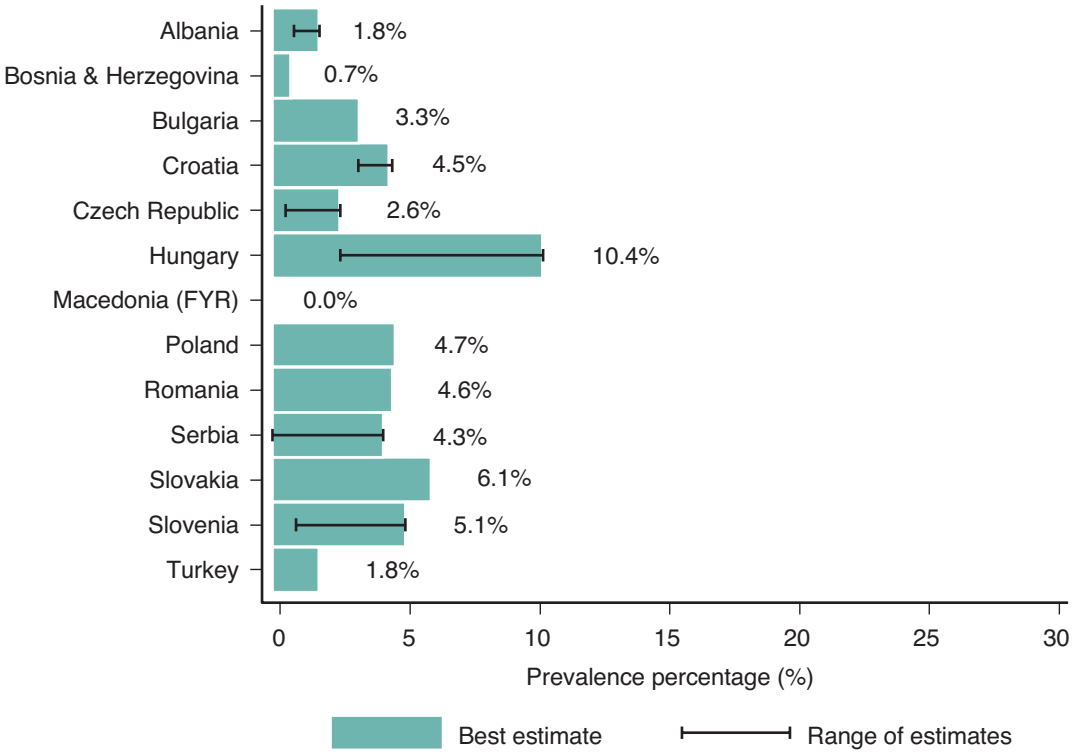
Figure 3.24 'Best' estimates of HIV prevalence among MSM in Western Europe



Source: Appendix 3.A.21

Thirteen countries in the Centre have HIV prevalence estimates for MSM from bio-behavioural surveys (Figure 3.25). The prevalence among MSM in this sub-region was lower than in the West. There were no cases of HIV among small community samples in The former Yugoslav Republic of Macedonia [39] and Pristina in Kosovo. [62] Prevalence was over 5% among community samples in the capitals of Serbia, [41] Slovakia and Slovenia. [21] Samples from Budapest, Hungary showed varied prevalence estimates of 10.4% [22] and 2.6%. [38]

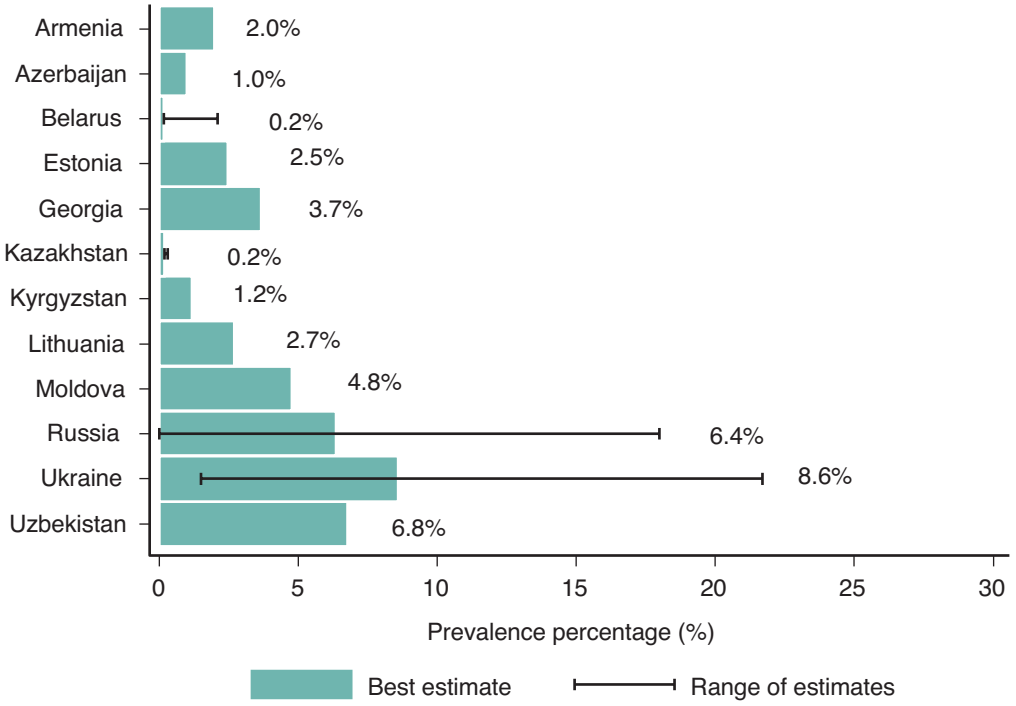
Figure 3.25 'Best' estimates of HIV prevalence among MSM in Central Europe



Source: Appendix 3.A.22

Twelve countries in Eastern Europe have estimates for HIV prevalence among MSM from bio-behavioural surveys (Figure 3.26). Prevalence varied from 0.2% in community studies in Kazakhstan [59] and zero in gay venues in Tomsk in Russia [58] to 10% and over in a community-based study in Krivoy Rog and Nikolayev and as high as 30% in Kiev, in Ukraine. [63]

Figure 3.26 'Best' estimates of HIV prevalence among MSM in Eastern Europe



Source: Appendix 3.A.23

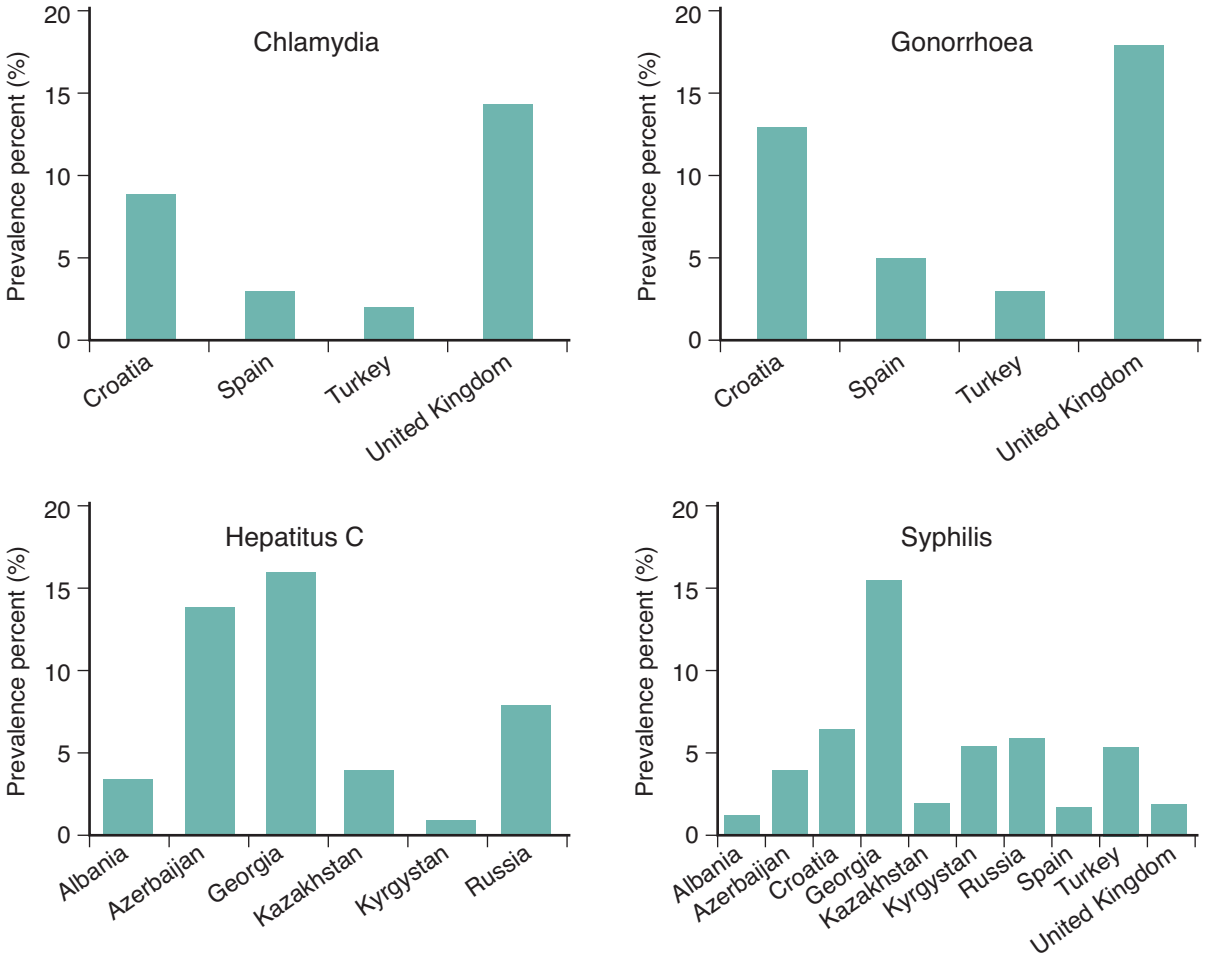
3.3.4 Prevalence of STI infections and hepatitis c among MSM

STI infection among respondents is reported in various ways: drawn from both biological data and self-reports of recent and older infections. Self-reported results may suffer from some level of recall bias, with some participants remembering details of their infections more accurately than others, which may or may not be related to their HIV serostatus. Certain STIs can increase an individual's susceptibility to HIV transmission, and high levels of STIs in a population can indicate higher levels of sexual risk (including lower condom use). [64]

A study in Valencia, Spain found syphilis prevalence to be 4% [4] while in Catalonia a study drawn from self-reported data suggested prevalence of syphilis was 3.3%, gonorrhoea was 4.8% and Chlamydia was 2.5% over the past year (See Figure 3.27). [6] A study in the United Kingdom comparing newly diagnosed HIV cases to controls (newly diagnosed HIV negative) found high prevalence of co-infection among HIV cases. Co-infection with gonorrhoea was 27% among the cases and 9% in the controls, syphilis was far higher (7%) in the cases and 1% in the controls, but chlamydia was lower in the cases (10%) than in the controls (19%). [15] A study in Croatia found the prevalence of chlamydia to be 9%, syphilis 10.6%, gonorrhoea 13.2% and HCV 3%. [35] A study in Albania found the prevalence of syphilis to be 2.6% and HCV to be 3.5%. [23] In Turkey a study found prevalence of syphilis to be 10.8%, gonorrhoea 3%, and chlamydia 1.8%. [18] In the East, in Azerbaijan HCV was 14% and syphilis 8%, although the study methods were unclear. [45] In Georgia, prevalence of syphilis was 31.4% (35.1% among those aged 25 years and 28.9% among those aged over 25 years) and prevalence of HCV was 15.7% (14% among those aged under 25years and 16.9% among older age groups). [25] Sentinel surveillance in Kazakhstan and Kyrgyzstan found prevalence of syphilis to be 4.1% and 10.7% respectively and HCV to be 4.2% and 1.2% respectively. [59] A study among MSWs in Moscow, Russian Federation found syphilis prevalence to be 12%, and antibodies to HCV 8%. [20] The lack of uniformity in the measures present-

ed here make interpretation difficult. However the relatively high proportions of respondents reporting particular infections imply low condom use or high rates of unsafe injecting by certain groups.

Figure 3.27 Prevalence of STIs among MSM in Europe



Source: Appendix 3.A.24 – 26

3.3.5 Factors associated with HIV

Factors associated with HIV: multivariate associations

Few of the identified studies examined risk factors associated with HIV or STI incidence and prevalence in multivariate models that adjust for confounding factors. Those that did are summarised in Appendices 3.A.30 – 32. All the studies were conducted in Western Europe and tended to be in areas of high HIV prevalence among MSM recruited from gay venues or STI clinics, limiting the generalisation of results to the wider MSM population. However, the results of these papers can be generalised to similar settings and to individuals attending similar sites.

Individual-level risk factors

Individual risk factors associated with HIV prevalence include age, number of sex partners, use of condoms, drug use and past experience of STIs. A Swiss study based in five cities [9] found that HIV prevalence was less common among 16 – 24 year olds than older age groups (25 to 34 and 35 to 44 years).

A United Kingdom study examining HIV prevalence in two Scottish cities, [65] found older age to be associated with HIV prevalence. Studies from the Netherlands (based in a variety of settings in Rotterdam and Amsterdam [11, 12]) showed non-consistent relationships between HIV incidence and age. Studies from Amsterdam showed the same increased risk among the 30 to 34 age group compared with young-

er MSM, but divergent findings with regards to those aged 35 and older. The Rotterdam study showed decreased risk among both older age groups compared with the respondents aged under 30 years.

Several studies examined numbers of sex partners as a risk factor as well as condom use. In Switzerland, respondents with 1 or less or 6 or more partners had elevated odds of HIV compared with those reporting between two and five partners, and having a partner known to be HIV positive was linked to twice the odds of HIV. Having a history of gonorrhoea and to a lesser extent, syphilis was associated with higher odds of HIV. [9] Risk of HIV was lower among MSM always using a condom with occasional partners than those reporting never or sometimes using a condom, but risk was higher compared to those reporting no occasional partners. In the United Kingdom, no real difference was seen among those having more than 10 sex partners in the past 12 months and those having less than 10, however those reporting having more than 10 anal sex partners in that period had over four times the odds of higher HIV prevalence than those with less than 10 anal sex partners. The number of partners for unprotected anal intercourse (UAI) did not appear to be associated with HIV prevalence, however respondents reporting an STI in the past year had over three times the odds of increased HIV prevalence than those without. [65]

UAI with more than one partner, casual partners and partners of unknown or discordant status were all independently associated with elevated odds of HIV prevalence. A study based in the same cities [15] found that HIV seroconversion was associated with some ancillary sexual behaviours including: oral-anal contact, 'rimming'; or being fisted; meeting men in 'cruising grounds' [outdoor public sex environments]; and in 'backrooms' [indoor public sex environments]; or online; using certain drugs (poppers, ecstasy, ketamine and LSD) before and during sex; and testing positive for certain STIs (gonorrhoea and syphilis). Some factors were found to be protective of seroconversion including: meeting men in gyms or toilets; using other drugs (cannabis and mushrooms); and the presence of certain STIs (chlamydia and pubic lice). In the Netherlands reporting UAI with a casual partner and STI co-infection were all found to be associated with increased risk of HIV. [11, 12]

Structural risk factors

Structural factors associated with HIV included migration status, city and use of STI clinics. In Switzerland, native Swiss MSM had lower odds of HIV than immigrants. [9] In Scotland there is some association between increased HIV prevalence and living in Edinburgh or outside of Scotland compared with Glasgow, some association between lower HIV prevalence and living in Scotland outside of Glasgow or Edinburgh. No strong differences were found between the respondents surveyed in Glasgow or Edinburgh or between those surveyed in a sauna or a bar. [65]

Two studies showed Dutch respondents to be at greater risk of HIV than respondents born elsewhere, and education to at least college level was shown to be associated with reduced risk of HIV prevalence. [11, 12] Another United Kingdom study based in three English cities [66] that adjusted for age and ethnicity found education after the age of 16 to be associated with reduced HIV prevalence. Being in employment was also associated with reduced prevalence. Having an STI in the previous 12 months and having attended a GUM clinic in the past 12 months were both associated with HIV prevalence.

3.3.6 Sexual vulnerability

Number of sex partners

Many studies collected data on numbers of sex partners. While time frames of either six or 12 months are generally used, there is much variation in classification and quantification of partners. While this makes comparison very difficult, it is possible to see that where both measures are reported, means are generally higher than medians, showing that while the majority of respondents may report quite low numbers of partners, a small minority report very large numbers. There is little evidence of any pattern by region, although evidence of very high partner numbers in towns with well known gay scenes such as Brighton and Amsterdam are visible, although this may reflect the characteristics of those attending the study recruitment locations only, and not the surrounding community (see Appendix 3.A.21 – 23).

Table 3.5 Number of sexual partners reported by MSM in Europe

Country (city)	Time period (months)	Regular partners	Casual partners	Commercial partners
		(%/median/mean)		
Western Europe				
Italy [21]	6	1 median, 2.6 mean	6 median, 12.0 mean	
Spain [21]	6	1 median, 1.6 mean	10 median, 16.3 mean	
Denmark [67]	12	Median 3, Mean 9.4		
France [68] (HIV positive men in regular relationships)	12	1 – 4 23.1% 5 + 25.7%		
Netherlands [10]	12	10 + 51%		
Netherlands [69]	12		Median 4	
Netherlands [69]	12		Median 5	
Spain (Catalonia, Barcelona) [6]	12	20+ 45%		
Switzerland (Zurich) [8]	12	Median range 4 – 10		
Switzerland [70]	12	Mean 11+		
United Kingdom (Brighton) [71]	12	13 + 32% – 35%		
United Kingdom (Nationwide) [71]	12	1 33.6%, 10 + 22.8%		
United Kingdom (Southern England) [72]	12	Median range 10 – 29		
Central Europe				
Albania [23]	6	5 + non-commercial, 34%		
Czech Republic [21]	6	1 median, 2.7 mean	4 median, 7.5 mean	
Romania [21]	6	2 median, 3.3 mean	3 median, 7.1 mean	
Slovakia [21]	6	1 median, 2 mean	3 median, 6.1 mean	
Slovenia [21]	6	1 median, 2.1 mean	3 median, 5.7 mean	
Croatia (Zagreb) [26, 35]	12	0 AI partners 23%, 1 AI partner 21 – 27% 3 – 10 AI partners 21 – 23%		
Eastern Europe				
Georgia [25]	6	1 – 5 69%		
Lithuania (7 cities) [73]	6	10 + 4.7%		
Republic of Moldova (Chisinau) [74]	6	Mean 3.8		
Russian Federation (Moscow) [75]	6	Mean 1.5	mean 10.7	
Russian Federation (Sochi) [75]	6	Mean 2.2	mean 23.9	
Ukraine[24]	6		Median 4	Median 3
Kazakhstan[76]	12	Mean 2.2	Mean 5.8	Mean 8.1
Kyrgyzstan [76]	12	Mean 2.3	Mean 4.5	Mean 2.4
Tajikistan [76]	12	Mean 5.1	Mean 20.2	Mean 21.4

Condom use

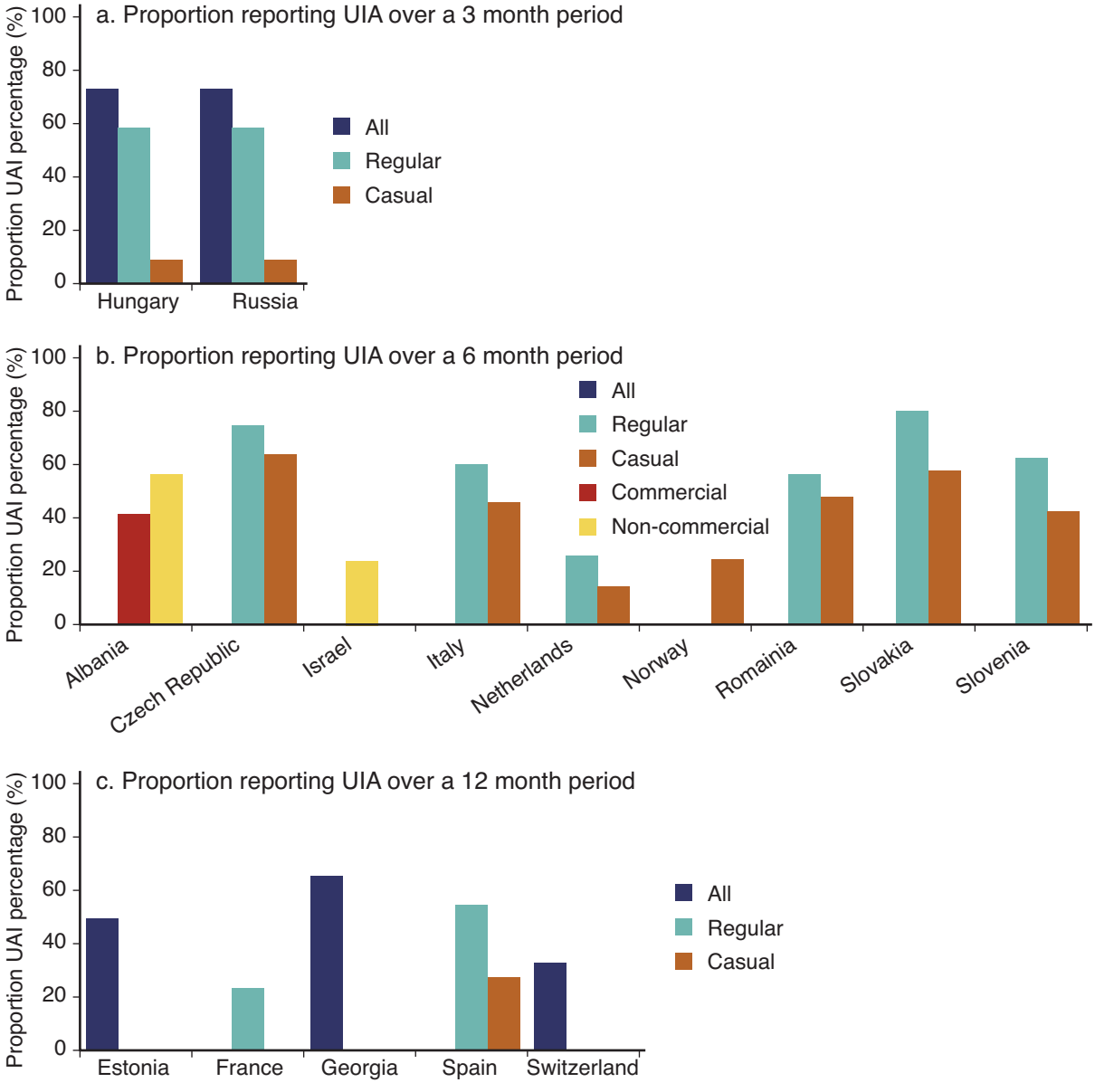
Many studies focussed on the prevalence of condom use between men for anal intercourse (AI). This was measured in a variety of ways, often disaggregated by a number of factors which makes compari-

sons among the various studies complex. Many studies, including EMIS, measure condom use through the percentage of MSM reporting condom use the last time they had AI with another male (limited to the past six months), corresponding to an UNGASS indicator. [77] Other studies chose to focus on participants reporting if they had any acts of UAI within a particular time frame; generally six months, but ranging from one to 24 months. Both approaches have advantages and disadvantages: indicators covering longer time periods may be more representative of an individual's general risk practices, however this may be subject to recall bias and condom use at the last instance of AI may be a more valid measure.

Unprotected anal intercourse in the past six months

Data for this indicator came from a variety of studies and so have been disaggregated into the proportion reporting UAI over: (i) three months; (ii) six months; and (iii) 12 months. UAI is also consistently more common with regular or steady partners than with casual partners (Figure 3.28). UAI over a six month period was slightly less frequently reported in the West (Israel, Italy, Netherlands and Norway) than countries in the Centre (Czech Republic, Romania, Slovakia and Slovenia). Similarly UAI over a 12 month period was higher in Estonia and Georgia than France, Spain and Switzerland.

Figure 3.28 Proportion of UAI during varying time periods specified, by partner type

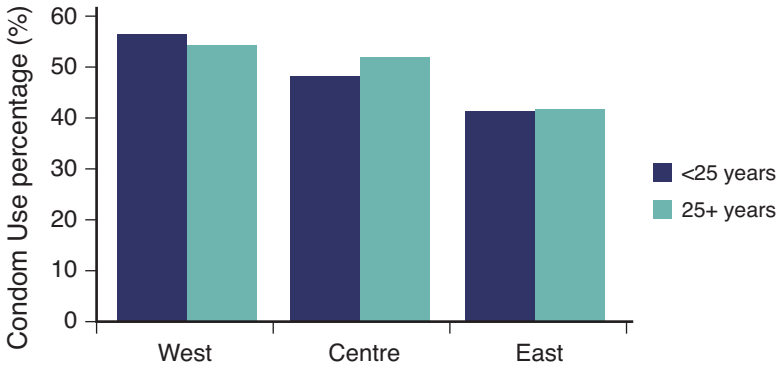


Source: see Appendix 3.A.27 – 29.
Note: UAI = unprotected anal intercourse.

Condom use at last anal intercourse

Findings of the EMIS study provide further evidence for this pattern with higher median condom use at last anal intercourse act in countries in the West, then Centre and then East (Figure 3.29). Among others, the Central Asian countries were not included in this study so these results cannot be generalised. The highest median condom use is found in the West, around 15% more than the reported use in the East of the region. The minimum reported proportion in the West was 41% (Sweden), the Centre 6% (The former Yugoslav Republic of Macedonia) and 37% in the East (Belarus). The maximum reported proportions were 69% in the West (Greece), 60% in the Centre (The former Yugoslav Republic of Macedonia) and 58% in the East (Ukraine). Generally there is little difference between those aged under and over 25 years, although in the Centre it appears that younger MSM are less likely to report condom use than their older counterparts.

Figure 3.29 Condom use at last anal intercourse AI among MSM



Source: EMIS. [78]
Notes: AI = anal intercourse; MSM = men who have sex with men.

Studies from outside the systematic review show that in some poorer countries, condoms may be unaffordable. For instance "average" quality condoms cost US$0.30 – 0.40 in Georgia, in comparison with an average monthly salary of US$50 – 70. [79] Qualitative data suggest that condom use among Georgian MSM was particularly rare in rural areas, and among younger, more economically disadvantaged MSM, many of whom have emigrated from these rural areas. [80]

3.3.7 FACTORS ASSOCIATED WITH UNPROTECTED SEX

Eleven studies that examined risk factors associated with unprotected sexual intercourse measured by reported condom use at last anal intercourse (AI) or reported UAI were identified by the systematic review. [6, 10, 17, 22, 24, 26, 81 – 85] These studies are presented in Figure 3.30 to Figure 3.33.

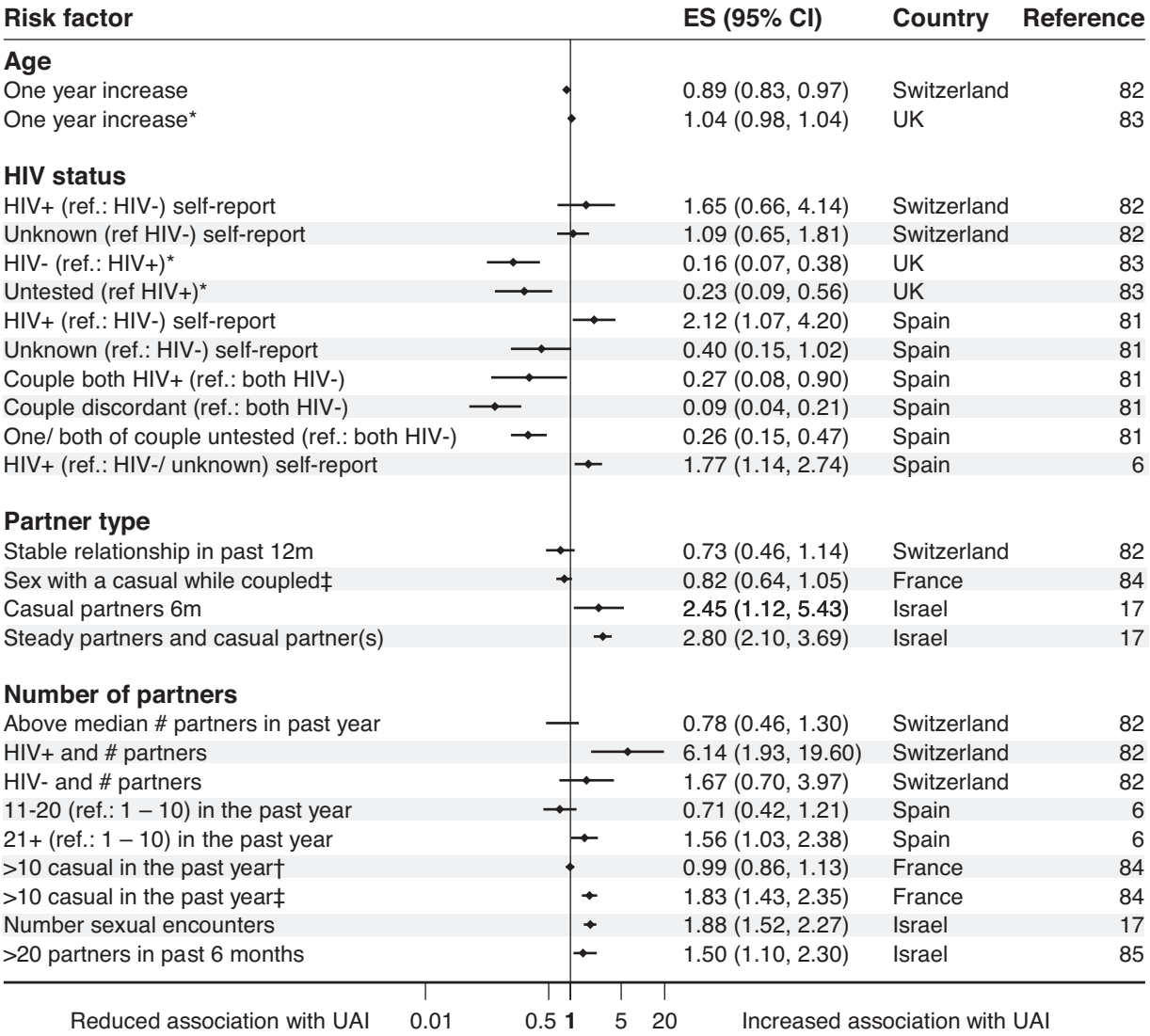
Individual risk factors associated with unprotected anal intercourse

Individual risk factors associated with UAI among MSM in the region included: partner types and numbers; drug use; HIV testing history; condom availability; and HIV status. Studies from the United Kingdom and Switzerland [82, 83] suggest that HIV negative respondents and those who have not undertaken a test are less likely to report UAI than their HIV positive counterparts. A Spanish study focusing on men with steady male partners found that serodiscordant or both HIV positive couples were less likely to practice UAI than both HIV negative couples. [81] Although data from Israel [17] showed men with casual or steady and casual partners having higher odds of reporting UAI, a French study among HIV positive respondents reported that those who had sex with a casual partner while in a relationship had lower odds of reporting UAI. [84] Although the association between number of partners and UAI is unclear, studies showing separate models according to serostatus show that HIV positive respondents with a higher number of partners have higher odds of reporting UAI than their HIV negative counterparts with similar partner numbers [82, 84] (Figure 3.30).

A French study found that engaging in a variety of ancillary sexual behaviours were associated with increased odds of UAI regardless of HIV status. [84] A Spanish study [81] found respondents reporting a

combination of two or more drugs (poppers, alcohol and others) had higher odds of UAI, ranging from 2.4 to 4.9 times greater than those who did not report any drug use. A later study in the same location [6] showed a clear increase in risk of UAI with number of drugs used. Compared with respondents not using drugs, those using 1 – 3 reported 1.1 times the odds of UAI, those using 4 – 6 reported 1.76 times the odds, and those using seven or more reported nearly five times the odds of UAI. [6] Other studies in France and the United Kingdom found drug and alcohol use associated with increased odds of UAI. [83, 84] A study among Central and Eastern European migrants in the United Kingdom found that a history of injecting in particular increased the likelihood of reporting UAI. The French study examined the associations for HIV positive and HIV negative respondents separately and the association between drug and alcohol use and UAI appear to be stronger among HIV positive respondents than the HIV negative respondents. Sex work and having a history of STIs were both associated with greater odds of reporting UAI (Figure 3.31).

Figure 3.30 Adjusted effect estimates for individual-level factors for UAI among MSM (i)



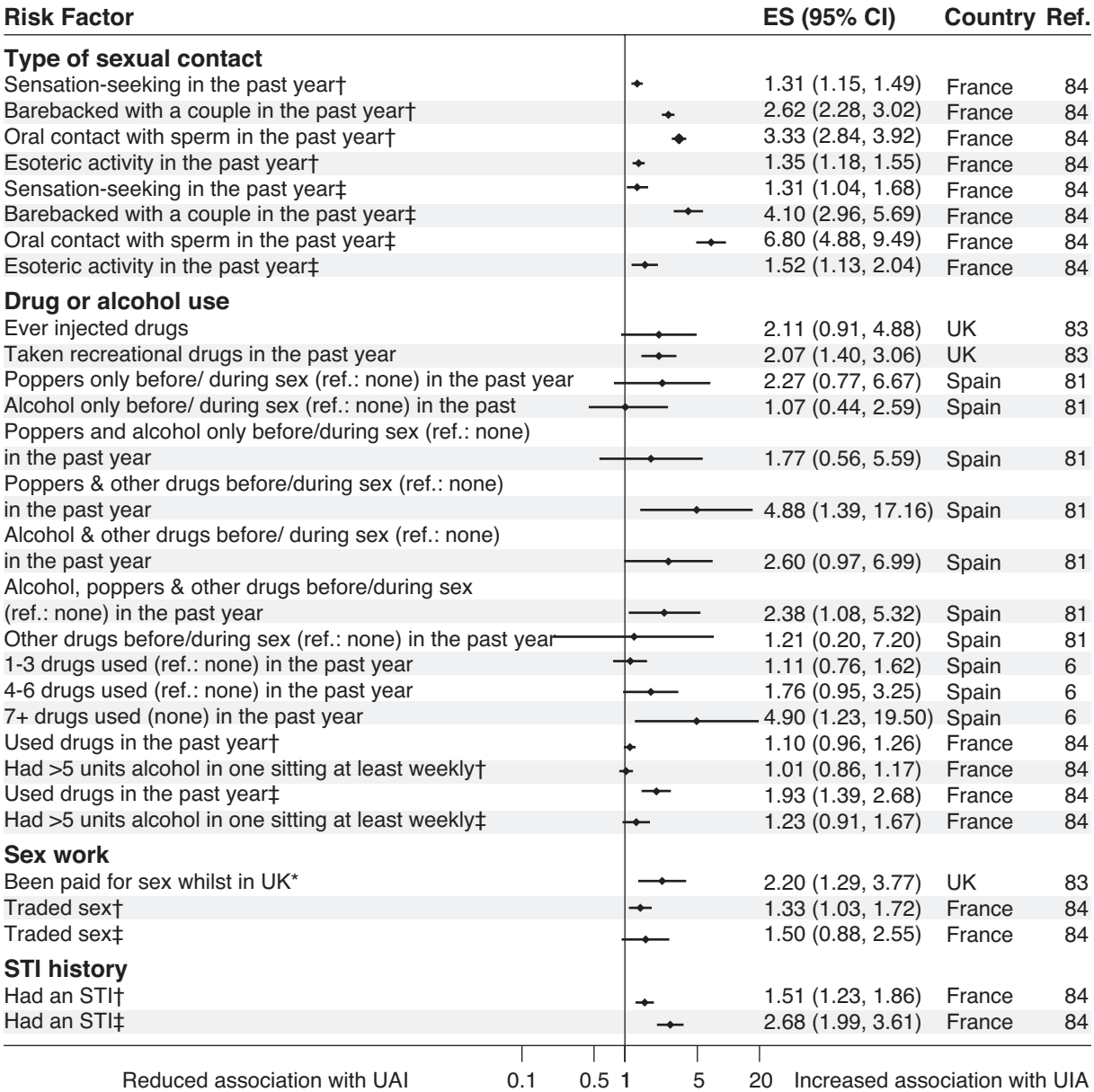
Notes: ref = reference; ES = estimate; CI = confidence interval; * = Sample of Central and Eastern European immigrants only; † = HIV negative respondents only; ‡ = HIV positive respondents only

Structural factors associated with unprotected anal intercourse

Structural factors associated with UAI included: education; country of origin; living arrangements; city of residence; recruitment site; venues used to meet sex partners and experience of homophobic violence (Figure 3.32). Studies in France and Israel clearly identified higher levels of education as being associated with lower odds of UAI, [17, 84] however, a study in Hungary and the Russian Federation found the

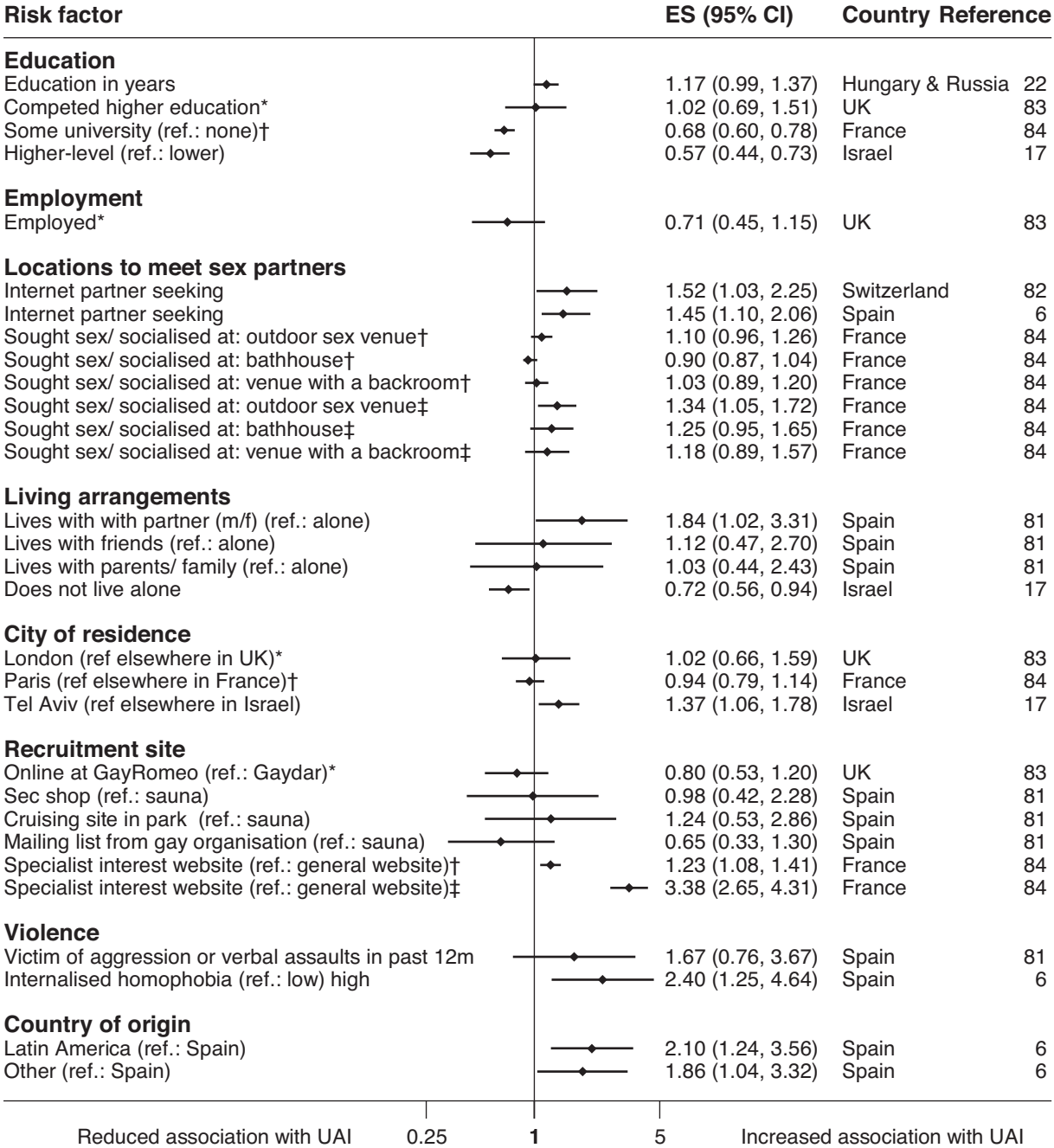
opposite, that additional years of education may be associated with increased odds of UAI. [22] Internet partner seeking was associated with higher odds of UAI in Western European studies, [6, 82] and although little difference could be observed between different gay venues in France where men may seek sex, HIV positive men appeared to face a greater association between attending these venues and higher odds of UAI. [84] A Spanish study found little difference in risk of UAI based on recruitment site (sauna, sex shop or cruising spot in the park), although respondents recruited via a gay organisation's mailing list had lower odds of UAI (AOR 0.65, 95% CI 0.33 – 1.30) than those respondents recruited from a sauna.[81] A study in the United Kingdom found similar results, [83] although an online study from France found that respondents recruited through specialist interest websites had higher odds of UAI than those recruited through general interest gay websites, particularly if they were HIV positive. [84] Respondents reporting being the victim of aggression or verbal assaults in the past year had 1.7 times the odds of reporting UAI than their counterparts who had not been victims. [81] Internalised homophobia, or feeling negatively about oneself because of homosexuality, was also associated with increased odds of UAI in a Spanish study. [6] A Spanish study showed that nonnegative nationals were more likely to be at risk of UAI than nationals, with Latin American respondents in particular having over twice the odds of reporting UAI than Spanish respondents. [6]

Figure 3.31 Adjusted effect estimates for individual-level factors for UAI among MSM (ii)



Source: Appendices 3.A.33.
Notes: ref = reference; * = sample of Central and Eastern European immigrants only; † = HIV- respondents only; ‡ = HIV positive respondents only.

Figure 3.32 Structural level adjusted effect estimates for UAI among MSM



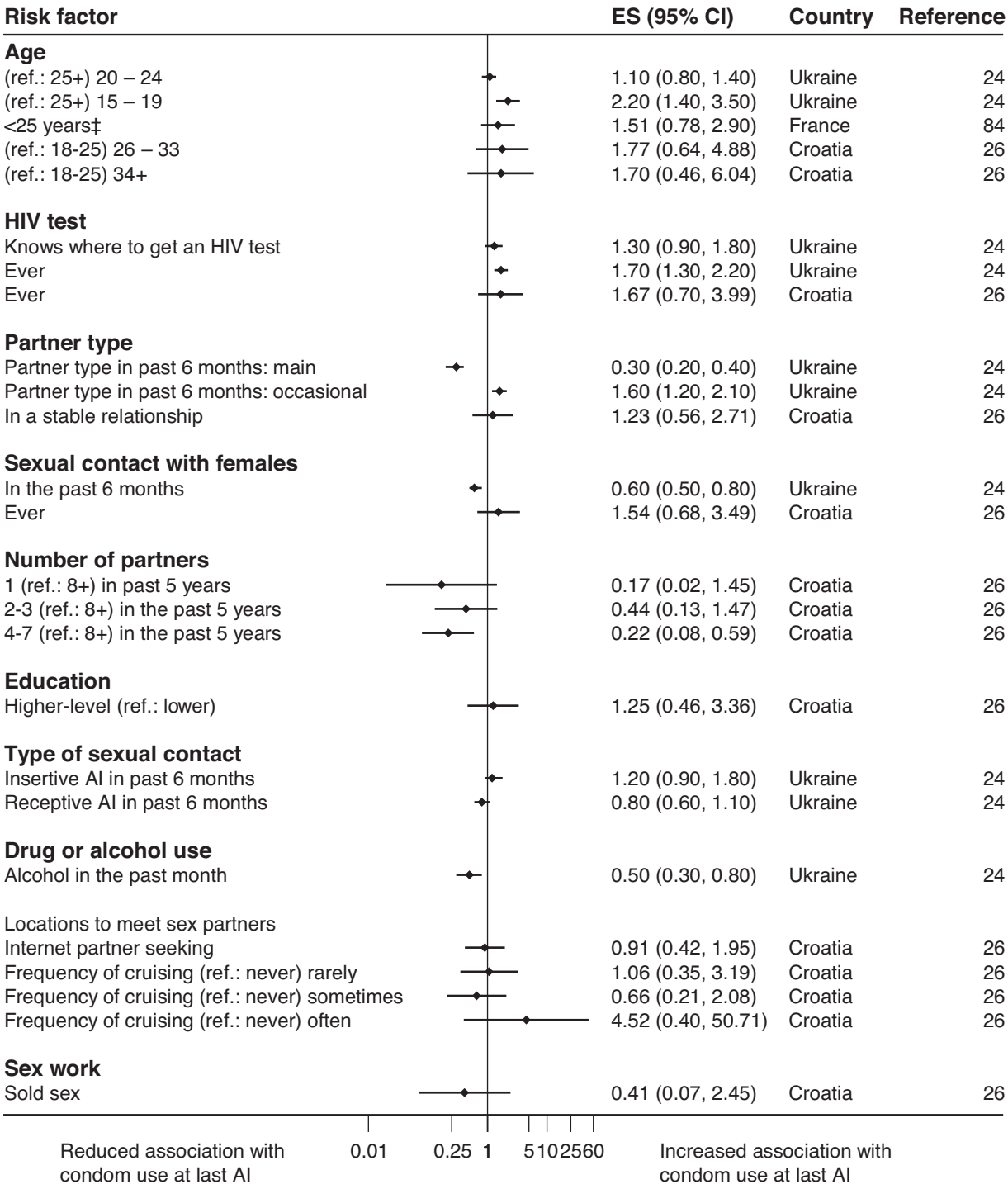
Source: Appendices 3.A.33.
Notes: * = Sample of Central and Eastern European immigrants only; ref = reference; UAI = unprotected anal intercourse; ES = estimate; † HIV negative respondents only; ‡ HIV positive respondents only.

Multivariate associations with condom use at last anal intercourse

Factors associated with condom use at last AI include younger age, ever having had an HIV test or knowing where to obtain one, having occasional male rather than regular male or females partners, not using alcohol and not engaging in sex work (Figure 3.33). A Ukrainian study suggested that younger age was associated with condom use at last AI: younger respondents were more likely to report using a condom at last AI; those aged between 15 – 19 had twice the odds of reporting condom use compared to those aged over 25 years and those aged 20 – 24 had 1.1 times the odds compared to their older counterparts. [24] A study in Croatia among HIV negative men found that older respondents had higher odds of condom use at last AI with casual partners than younger. [26] Respondents reporting insertive AI in the past six months had higher odds of reporting condom use at last AI compared to those reporting receptive AI, maybe reflecting decision making roles that accompany positions. [24] MSM respondents

reporting a regular or female partner in the past six months had lower odds of condom use at last AI than their counterparts who reported male casual partners or no partners. Conversely, respondents reporting occasional partners in the same time period had higher odds of using a condom at the last AI. Finally, while using alcohol in the last month was associated with lower odds of using a condom at last intercourse, ever having had an HIV test and knowing where to get an HIV test were associated with higher odds of condom use at last AI.

Figure 3.33 Adjusted effect estimates for condom use at last AI among MSM



Source: Appendices 3.A.33.
Notes: * = Sample of Central and Eastern European immigrants only; † = HIV negative respondents only; ‡ = HIV positive respondents only; ref = reference; AI = anal intercourse; CI = confidence interval; ES = estimate.

Ukrainian and Croatian studies found that respondents reporting ever having had an HIV test were associated with less risky behaviour: odds of using a condom at last AI were around 1.7 times higher among respondents reporting a history of testing. [24, 26] Although respondents reporting rare or occasional cruising were not at increased or decreased risk of condom use, respondents who cruised often had higher odds of condom use at last AI (OR=4.5 95% CI 0.4 – 50.71) Other sexual characteristics, such as sex with a woman, selling sex or being in a stable relationship did not appear to be associated with condom use at last AI.

3.3.8 Concluding comment

The systematic review demonstrates that HIV is highest in the West (9 – 18%), generally low or medium in the Centre and East (<5%). Structural risk factors associated with unprotected anal intercourse included levels of education, employment, experience of violence and country of origin.

References

Chapter 3.1 People who inject Drugs

[1] Mathers, B.M., et al., Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *The Lancet,* 2008. 372(9651): p. 1733 – 1745.

[2] Bargagli, A.M., et al., Drug-related mortality and its impact on adult mortality in eight European countries. European Journal of Public Health, 2006. 16(2): p. 198 – 202.

[3] Degenhardt, L., W. Hall, and M. Warner-Smith, Using cohort studies to estimate mortality among injecting drug users that is not attributable to AIDS. *Sexually Transmitted Infections,* 2006. 82(suppl 3): p. iii56 – iii63.

[4] European Centre for Disease Prevention and Control/WHO Regional Office for Europe, *HIV/AIDS surveillance in Europe 2009*, 2010, European Centre for Disease Prevention and Control: Stockholm.

[5] Baggaley, R.F., et al., Risk of HIV-1 transmission for parenteral exposure and blood transfusion: a systematic review and meta-analysis. *AIDS,* 2006. 20(6): p. 805 – 812 10.1097/01.aids.0000218543.46963.6d.

[6] Boily, M.-C., et al., Heterosexual risk of HIV-1 infection per sexual act: systematic review and meta-analysis of observational studies. *The Lancet, Infectious Diseases*, 2009. 9(2): p. 118 – 129.

[7] Stvilia, K., et al., Prevalence of Hepatitis C, HIV, and Risk Behaviors for Blood-Borne Infections: A Population-Based Survey of the Adult Population of T'bilisi, Republic of Georgia. *Journal of Urban Health,* 2006. 83(2): p. 289 – 298.

[8] Kuniholm, M.H., et al., Not All Injection Drug Users Are Created Equal: Heterogeneity of HIV, Hepatitis C Virus, and Hepatitis B Virus Infection in Georgia. *Substance Use & Misuse,* 2008. 43(10): p. 1424 – 1437.

[9] Gambashidze, N., Sikharulidze, Z., Piralishvili, G., Gvakharia, N., Evaluation of Pilot Methadone Maintenance Therapy in Georgia (Caucuses). *Georgian Medical News*, 2008. 7 – 8: p. 160 – 161.

[10] Shapatava E, N.K., Tsertsvadze T, del Rio C., Risk behaviors and HIV, hepatitis B, and hepatitis C seroprevalence among injection drug users in Georgia. *Drug and Alcohol Dependenceency*, 2006. 82: p. S35 – S38.

[11] Smolskaya, T.T., Yakovleva, A.A., Kasumov, V.K., Gheorgitsa, S.I. , HIV Sentinel Surveillance in High-Risk Groups in Azerbaijan, Republic of Moldova and in the Russian Federation, 2004, World Health Organisation (WHO), Europe.

[12] UNGASS, UNGASS Country Progress Report: Georgia, 2010.

[13] Chikovani, I., et al., Unsafe Injection and Sexual Risk Behavior among Injecting Drug Users in Georgia. *Journal of Urban Health-Bulletin of the New York Academy of Medicine*, 2011. 88(4): p. 736 – 748.

[14] Ataiants, J., Rychkova, O., Janashia, N., Bidzinashvili, K., Usharidze, D. , Tailored harm reduction approaches bring healthcare and social support to women who use drugs in Georgia, in XVIII International AIDS Conference 2010: Vienna, Austria.

[15] Soliev, A., Analysis on epidemiological situation and responses based on second generation sentinel surveillance system among injecting drug users, Tajikistan, Kazakhstan, Kyrgyzstan, 2006 – 2009, 2010.

[16] Busza, J.R., et al., Street-based adolescents at high risk of HIV in Ukraine. *Journal of Epidemiology and Community Health,* 2010.

[17] Jauffret-Roustide, M., Couturier, E., Le Strat, Y., Barin, F., Emmanuelli, J., Semaille, C., Quaglia, M., Razafindratsima, N., Vivier, G., Oudaya, L., Lefevre, C., Desenclos, J.-C., Estimation de la séroprévalence du VIH et du VHC et profils des usagers de drogues en France, étude InVS-ANRS Coquelicot, 2004. *Bulletin épidémiologique hebdomadaire*, 2006. 33.

[18] Cleland, C.M., et al., HIV risk behaviors among female IDUs in developing and transitional countries. *BMC Public Health,* 2007. 7(1): p. 271.

[19] Ncube, F., Hope, V., Marongiu, A., Parry, J., Gender and drug injecting related risk and health harms in the United Kingdom: A need for targeted interventions, in International Harm Reduction Conference 2009: Bangkok.

[20] Brugal, M.T., et al., Injecting, Sexual Risk Behaviors and HIV Infection in Young Cocaine and Heroin Users in Spain. *European Addiction Research,* 2009. 15(3): p. 171 – 178.

[21] Talu, A., et al., HIV infection and risk behaviour of primary fentanyl and amphetamine injectors in Tallinn, Estonia: Implications for intervention. *International Journal of Drug Policy,* 2010. 21(1): p. 56 – 63.

[22] Quaglio, G., et al., Patients in long-term maintenance therapy for drug use in Italy: analysis of some parameters of social integration and serological status for infectious diseases in a cohort of 1091 patients. *BMC Public Health,* 2006. 6(1): p. 216.

[23] Napoli, C., et al., Risk factors for HBV/HIV/HCV in drug addicts: a survey of attendees of a department of pathological dependence. *Journal of Preventive Medicine & Hygiene*, 2010. 51(3): p. 101 – 4.

[24] Jauffret-Roustide, M., et al., Impact of a Harm-Reduction Policy on HIV and Hepatitis C Virus Transmission Among Drug Users: Recent French Data—The ANRS-Coquelicot Study. *Substance Use & Misuse,* 2006. 41(10 – 12): p. 1603 – 1621.

[25] Dumchev, K.V., et al., HIV and hepatitis C virus infections among hanka injection drug users in central Ukraine: a cross-sectional survey. *Harm Reduction Journal,* 2009. 6(1): p. 23.

[26] Taran, Y.S., et al., Correlates of HIV Risk Among Injecting Drug Users in Sixteen Ukrainian Cities. *AIDS and Behavior,* 2011. 15(1): p. 65 – 74.

[27] Abdala N., W.E., Toussova O.V., Krasnoselskikh T.V., Verevochkin S., Kozlov A.P., Heimer R., Comparing sexual risks and patterns of alcohol and drug use between injection drug users (IDUs) and non-IDUs who report sexual partnerships with IDUs in St. Petersburg, Russia. *BMC Public Health,* 2010. 10(pp 676).

[28] Wall, M., et al., Sex, drugs and economic behaviour in Russia: A study of socio-economic characteristics of high risk populations. *International Journal of Drug Policy,* 2011. In Press, Corrected Proof.

[29] Richardson, L., Wood, E., Kerr, T., Analysing the relationship between employment levels and HIV-related risk among people who inject drugs, in XVIII International AIDS Conference2010: Vienna, Austria.

[30] Strathdee, S.A., et al., HIV and risk environment for injecting drug users: the past, present, and future. *The Lancet,* 2010. 376(9737): p. 268 – 284.

[31] Degenhardt L, M.B., Vickerman P, Rhodes T, Latkin C, Hickman M., Prevention of HIV infection for people who inject drugs: why individual, structural, and combination approaches are needed. *The Lancet,* 2010. 376: p. 285 – 301.

[32] Jürgens, R., et al., People who use drugs, HIV, and human rights. *The Lancet,* 2010. 376(9739): p. 475 – 485.

[33] Beyrer, C., et al., Drug Use, Increasing Incarceration Rates, and Prison-Associated HIV Risks in Thailand. *AIDS and Behavior,* 2003. 7(2): p. 153 – 161.

[34] Choopanya, K., et al., Risk factors and HIV seropositivity among injecting drug users in Bangkok. *AIDS,* 1991. 5(12): p. 1509 – 1513.

[35] Pollini, R.A., et al., Syringe possession arrests are associated with receptive syringe sharing in two Mexico–US border cities. *Addiction,* 2008. 103(1): p. 101 – 108.

[36] Rhodes, T., et al., Injecting Equipment Sharing Among Injecting Drug Users in Togliatti City, Russian Federation: Maximizing the Protective Effects of Syringe Distribution. *Journal of Acquired Immune Deficiency Syndromes,* 2004. 35(3): p. 293 – 300.

[37] Kerr, T., W. Small, and E. Wood, The public health and social impacts of drug market enforcement: A review of the evidence. *International Journal of Drug Policy,* 2005. 16(4): p. 210 – 220.

[38] Bluthenthal, R.N., et al., Collateral damage in the war on drugs: HIV risk behaviors among injection drug users. *International Journal of Drug Policy,* 1999. 10(1): p. 25 – 38.

[39] Booth, R., Dvoryak, S., Anderson, C., John, B., Strathdee, S., Police brutality is independently associated with sharing injection equipment among injection drug users in Odessa, Ukraine, in XVIII International AIDS Conference 2010: Vienna, Austria.

[40] International Harm Reduction Association, The Global State of Harm Reduction 2010: Key issues for broadening the response, C. Cook, Editor 2010.

[41] Beyrer, C., Patel, Z., Stachowiak, J.A., Tishkova, F.K., Stibich, M.A., Eyzaguirre, L.M., Carr, J.K., Mogilnii, V., Peryshkina, A., Latypov, A., Strathdee, S.A., Characterization of the Emerging HIV Type 1 and HCV Epidemics among Injecting Drug Users in Dushanbe, Tajikistan. *AIDS Research and Human Retroviruses*., 2009. 25(9): p. 853 – 860.

[42] Judd, A., et al., Improving survey methods in sero-epidemiological studies of injecting drug users: a case example of two cross sectional surveys in Serbia and Montenegro. *BMC Infectious Diseases*, 2009. 9(1): p. 14.

[43] Rhodes, T., et al., Situational factors influencing drug injecting, risk reduction and syringe exchange in Togliatti City, Russian Federation: a qualitative study of micro risk environment. *Social Science & Medicine,* 2003. 57(1): p. 39 – 54.

[44] Sarang, A., et al., Policing Drug Users in Russia: Risk, Fear, and Structural Violence. *Substance Use & Misuse,* 2010. 45(6): p. 813 – 864.

[45] Cooper, H., et al., The impact of a police drug crackdown on drug injectors' ability to practice harm reduction: A qualitative study. *Social Science & Medicine,* 2005. 61(3): p. 673 – 684.

[46] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Statistical bulletin 2010. 2010; Available from: http://www.emcdda.europa.eu/stats10.

[47] Uuskula, A., et al., Expanded syringe exchange programs and reduced HIV infection among new injection drug users in Tallinn, Estonia. *BMC Public Health,* 2011. 11.

[48] Expanding Network for Comprehensive and Coordinated Action on HIV/AIDS prevention among IDUs and Bridging Population (ENCAP), Prevalence of HIV and other infections and risk behaviour among Injecting Drug Users in Latvia, Lithuania and Estonia in 2007, 2009.

[49] Vassilev, Z.P., et al., Needle exchange use, sexual risk behaviour, and the prevalence of HIV, hepatitis B virus, and hepatitis C virus infections among Bulgarian injection drug users. *International Journal of STD & AIDS,* 2006. 17(9): p. 621 – 626.

[50] Kivela, P.S., et al., High prevalence of unprotected sex among Finnish HIV-positive and HIV-negative injecting drug users. *Scandinavian Journal of Public Health*, 2009. 37(4): p. 357 – 363.

[51] Aceijas, C. and T. Rhodes, Global estimates of prevalence of HCV infection among injecting drug users. *International Journal of Drug Policy,* 2007. 18(5): p. 352 – 358.

[52] Rhodes, T., et al., Hepatitis C virus infection, HIV co-infection, and associated risk among injecting drug users in Togliatti, Russia. *International Journal of STD & AIDS,* 2005. 16(11): p. 749 – 754.

[53] Jauffret-Roustide, M., et al., A national cross-sectional study among drug-users in France: epidemiology of HCV and highlight on practical and statistical aspects of the design. *BMC Infectious Diseases*, 2009. 9(1): p. 113.

[54] Kolaric, B., et al., Seroprevalence of blood-borne infections and population sizes estimates in a population of injecting drug users in Croatia. *Central European Journal of Public Health*, 2010. 18(2): p. 104 – 9.

[55] Gyarmathy, V. and A. Neaigus, Marginalized and Socially Integrated Groups of IDUs in Hungary: Potential bridges of HIV infection. *Journal of Urban Health,* 2005. 82(0): p. iv101 – iv112.

[56] Loebstein, R., Mahagna, R, Maor, Y, Kurnik, D, Elbaz, E, Halkin, H, Olchovsky, D, Ezra, D, Almog, S., Hepatitis C, B, and Human Immunodeficiency Virus Infections in Illicit Drug Users in Israel : *Prevalence and Risk Factors*. Vol. 10. 2008, Ramat Gan, ISRAEL: Israel Medical Association. 4.

[57] Craine, N., et al., Characteristics of injecting drug users accessing different types of needle and syringe programme or using secondary distribution. *Journal of Public Health*, 2010. 32(3): p. 328 – 335.

[58] Hartnoll, R., Gyarmathy, A., Zabransky, T., Variations in problem drug use patterns and their implications for harm reduction, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor 2010, Publications Office of the European Union: Luxembourg. p. 462.

[59] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), *Polydrug Use: Patterns and Responses*, 2009: Luxembourg.

[60] Grund, J.-P., Coffin, P., Jauffret-Roustide, M., Dijkstra, M.,de Bruin, D., Blanken, P., The fast and furious–cocaine, amphetamines and harm reduction, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor 2010, Publications Office of the European Union: Luxembourg. p. 191 – 232.

[61] Camoni, L., et al., Prevalence and correlates of infection with human immunodeficiency virus, hepatitis B virus, and hepatitis C virus among drug users in Italy: A cross-sectional study. *Scandinavian Journal of Infectious Diseases,* 2009. 41(6 – 7): p. 520 – 523.

[62] Nordén, L. and C. Lidman, Differentiated risk behaviour for HIV and hepatitis among injecting drug users (IDUs). Scandinavian *Journal of Infectious Diseases,* 2005. 37(6 – 7): p. 493 – 496.

[63] Van Den Berg, C., et al., Full participation in harm reduction programmes is associated with decreased risk for human immunodeficiency virus and hepatitis C virus: evidence from the Amsterdam Cohort Studies among drug users. *Addiction,* 2007. 102(9): p. 1454 – 1462.

[64] Huntington, S., et al., [Prevalence of human immunodeficiency virus and hepatitis C virus, and associated factors among injecting drug users in Catalonia]. *Enfermedades Infecciosas y Microbiologia Clinica*, 2010. 28(4): p. 236 – 8.

[65] Removille, N., et al., A hepatitis A, B, C and HIV prevalence and risk factor study in ever injecting and non-injecting drug users in Luxembourg associated with HAV and HBV immunisations. *BMC Public Health,* 2011. 11(351): p. (19 May 2011).

[66] Rhodes, T., et al., Crack–heroin speedball injection and its implications for vein care: qualitative study. *Addiction,* 2007. 102(11): p. 1782 – 1790.

[67] Alho, H., et al., Abuse liability of buprenorphine-naloxone tablets in untreated IV drug users. *Drug and alcohol dependence,* 2007. 88(1): p. 75 – 78.

[68] Scutelniciuc, O., Ilinschi, E., Assessment of Risk of HIV infection among Most at Risk Adolescents, 2009, Ministry of Health of the Republic of Moldova, National Center of Health Management Monitoring and Evaluation of National Health Programmes, National Drug Observatory: Chisinau.

[69] Pohorila, N., Taran, Y., Kolodiy, I., Diyeva, T., Behavior monitoring and HIV-infection prevalence among injection drug users, 2010, ICF “International HIV/AIDS Alliance in Ukraine”: Kyiv.

[70] Abel-Ollo, K., et al., Knowledge of HIV serostatus and risk behaviour among injecting drug users in Estonia. *AIDS Care,* 2009. 21(7): p. 851 – 857.

[71] Platt, L., et al., High HIV prevalence among injecting drug users in Estonia: implications for understanding the risk environment. *AIDS,* 2006. 20(16): p. 2120 – 2123 10.1097/01.aids.0000247586.23696.20.

[72] Alini, E., The first step is denial: Russia blames NATO policies for its heroin crisis. But is Afghanistan just a scapegoat for a broader problem?, in Macleans.ca 2011, Kenneth Whyte: Toronto, Ontario.

[73] Grund, J.-P., Zabransky, T., Irvin, K., Heimer, R., Stimulant use in central and eastern Europe: how recent social history shaped current drug consumption patterns, in Interventions for amphetamine misuse, R. Pates, Riley, D., Editor 2009, Wiley Blackwell: Oxford.

[74] Chintalova-Dallas, R., et al., Boltushka: A homemade amphetamine-type stimulant and HIV risk in Odessa, Ukraine. *International Journal of Drug Policy,* 2009. 20(4): p. 347 – 351.

[75] Márványkövi, F., K. Melles, and J. Rácz, Sex and Drugs: The Correlations of Injecting Drug Users’ Risk Perception and Behavioral Patterns. *Substance Use & Misuse,* 2009. 44(4): p. 569 – 577.

[76] Rácz, J., et al., Injecting equipment sharing and perception of HIV and hepatitis risk among injecting drug users in Budapest. AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV, 2007. 19(1): p. 59 – 66.

[77] Colfax, G., et al., Amphetamine-group substances and HIV. *The Lancet,* 2010. 376(9739): p. 458 – 474.

[78] Griffiths, P., et al., Quite a lot of smoke but very limited fire—the use of methamphetamine in Europe. *Drug and Alcohol Review,* 2008. 27(3): p. 236 – 242.

[79] Gyarmathy, A.V., A. Neaigus, and E. Ujhelyi, Vulnerability to drug-related infections and co-infections among injecting drug users in Budapest, Hungary. *The European Journal of Public Health,* 2009. 19(3): p. 260 – 265.

[80] Abdala, N., et al., Can home-made injectable opiates contribute to the HIV epidemic among injection drug users in the countries of the former Soviet Union? *Addiction,* 2006. 101(5): p. 731 – 737.

[81] Rhodes, T., et al., HIV transmission and HIV prevention associated with injecting drug use in the Russian Federation. *International Journal of Drug Policy,* 2004. 15(1): p. 1 – 16.

[82] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), Annual report 2010: the state of the drugs problem in Europe, 2010: Luxembourg.

[83] Van Beek, I., R. Dwyer, and A. Malcolm, Cocaine injecting: the sharp end of drug-related harm! *Drug and Alcohol Review,* 2001. 20(3): p. 333 – 342.

[84] Kruse, G., et al., Drug choice, spatial distribution, HIV risk, and HIV prevalence among injection drug users in St. Petersburg, Russia. *Harm Reduction Journal,* 2009. 6(1): p. 22.

[85] Kozlov, A.P., et al., HIV incidence and factors associated with HIV acquisition among injection drug users in St Petersburg, Russia. *AIDS,* 2006. 20(6): p. 901 – 906 10.1097/01.aids.0000218555.36661.9c.

[86] Booth, R.E., et al., Stimulant Injectors in Ukraine: The Next Wave of the Epidemic? *AIDS and Behavior,* 2008. 12(4): p. 652 – 661.

[87] Shulga, L., Smyrnov, P., Increased stimulant use in Ukraine: focus-groups results, in International Harm Reduction Conference 2009: Bangkok.

[88] Hope, V., Marongiu, A., Ncube, F., Parry, J., Stimulant injection a focus for harm: An examination of data from England, Wales and Northern Ireland, in International Harm Reduction Conference 2009: Bangkok.

[89] Mathers BM, D.L., Ali H, Wiessing L, Hickman M, Mattick RP, Myers B, Ambekar A, Strathdee SA, HIV prevention, treatment, and care services for people who inject drugs: a systematic review of global, regional, and national coverage. *The Lancet,* 2010. 375: p. 1014 – 1028.

[90] Platt, L., et al., Impact of Gender and Sex Work on Sexual and Injecting Risk Behaviors and Their Association With HIV Positivity Among Injecting Drug Users in an HIV Epidemic in Togliatti City, Russian Federation. *Sexually Transmitted Diseases,* 2005. 32(10): p. 605 – 612.

[91] Platt, L., et al., Changes in HIV Prevalence and Risk Among New Injecting Drug Users in a Russian City of High HIV Prevalence. *Journal of Acquired Immune Deficiency Syndromes,* 2008. 47(5): p. 623 – 631 10.1097/QAI.0b013e318165dbf7.

[92] Gyarmathy, V.A., et al., Liquid Drugs and High Dead Space Syringes May Keep HIV and HCV Prevalence High—A Comparison of Hungary and Lithuania. *European Addiction Research,* 2010. 16(4): p. 220 – 228.

[93] Rhodes, T., et al., Prevalence of HIV, hepatitis C and syphilis among injecting drug users in Russia: a multi-city study. *Addiction,* 2006. 101(2): p. 252 – 266.

[94] Longfield, K., Robinson, A., Gray, R., Jones, C., Youth Perspectives on Drug Use, Heroin, and Risk for HIV/AIDS in Tajikistan and Uzbekistan, Central Asia, 2005, Population Services International Research Division.

[95] Todd, C.S., et al., Prevalence and correlates of risky sexual behaviors among injection drug users in Tashkent, Uzbekistan. *AIDS Care,* 2007. 19(1): p. 122 – 129.

[96] Uuskula, A., et al., High prevalence of blood-borne virus infections and high-risk behaviour among injecting drug users in Tallinn, Estonia. *International Journal of STD & AIDS,* 2007. 18(1): p. 41 – 46.

[97] Bruckova M, B.C., Graham RR, Maly M, Vandasova J, Presl J, Sumegh L, Chapman GD, Carr JK, Sanchez JL, Earhart KC., Short report: HIV infection among commercial sex workers and injecting drug users in the Czech Republic. *American Journal of Tropical Medicine and Hygiene,* 2006. 75(5): p. 1017 – 1020.

[98] UNGASS, UNGASS Country Progress Report: Finland, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[99] Stark, K., et al., A syringe exchange programme in prison as prevention strategy against HIV infection and hepatitis B and C in Berlin, Germany. *Epidemiology and Infection*, 2005. 134(04): p. 814.

[100] Nikolaou, K., Kovatsi, L., Njau, S., Zlatanos, D., Passali, M., Sgourou, K., Organtzoglou, E., Hepatitis C, Hepatitis B and HIV infections in intravenous drug users in Greece and associated risk behavior. Clinical Toxicology, 2010. Conference: p. 2010 International Congress of the European Association of Poisons Centres and Clinical Toxicologists Bordeaux France. Conference Start: 20100511 Conference End: 20100514. Conference Publication: (var.pagings). 48 (3) (pp 307).

[101] Grogan, L., et al., Bloodborne virus infections among drug users in Ireland: a retrospective cross-sectional survey of screening, prevalence, incidence and hepatitis B immunisation uptake. *Irish Journal of Medical Science*, 2005. 174(2): p. 14 – 20.

[102] Barrio, G., et al., Prevalence of HIV infection among young adult injecting and non-injecting heroin users in Spain in the era of harm reduction programmes: gender differences and other related factors. *Epidemiology and Infection*, 2006. 135(04): p. 592.

[103] de la Fuente, L., Injecting and HIV prevalence among young heroin users in three Spanish cities and their association with the delayed implementation of harm reduction programmes. *Journal of Epidemiology & Community Health*, 2006. 60(6): p. 537 – 542.

[104] Folcha, C., Meroñob, M., Casabona, J., Factores asociados a la práctica de compartir jeringuillas usadas entre usuarios de droga por vía parenteral reclutados en la calle. Medicina clinica (Barcelona). 2006. 127(14): p. 526 – 532.

[105] Hurtado Navarro, I., et al., Differences between women and men in serial HIV prevalence and incidence trends. *European Journal of Epidemiology,* 2008. 23(6): p. 435 – 440.

[106] Muga R, S.A., Bolao F, Tor J, Santesmases J, Pujol R, Tural C, Langohr K, Rey-Joly C, Muñoz A., Significant reductions of HIV prevalence but not of hepatitis C virus infections in injection drug users from metropolitan Barcelona: 1987 – 2001. *Drug and Alcohol Dependence,* 2006. 82: p. S29 – S33.

[107] Prasad, L.R., et al., Changing epidemiology of HIV anonymous testing in Switzerland for 1996 – 2006. *Swiss Medical Weekly,* 2009. 139(17 – 18): p. 256 – 63.

[108] Gerlich, M., et al., Prevalence of hepatitis and HIV infections and vaccination rates in patients entering the heroin-assisted treatment in Switzerland between 1994 and 2002. *European Journal of Epidemiology,* 2006. 21(7): p. 545 – 549.

[109] Health Protection Scotland, *HPS Weekly Report*, 2006, NHS National Services Scotland.

[110] Health Protection Scotland, *HPS Weekly Report*, 2007, NHS National Services Scotland.

[111] Judd A, H.M., Jones S, McDonald T, Parry JV, Stimson GV, Hall AJ., Incidence of hepatitis C virus and HIV among new injecting drug users in London: prospective cohort study. *BMJ,* 2005. 330: p. 24 – 5.

[112] Shooting up: infections among injecting drug users in the United Kingdom 2010. An update, November 2011, in Shooting up: infections among injecting drug users in the United Kingdom 2011.

[113] Public Health England, U., London., Unlinked Anonymous survey of Injecting Drug Users (IDUs).

[114] UNGASS, Country Progress Report: Republic of Armenia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2008.

[115] UNGASS, UNGASS Country Progress Report: Republic of Armenia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[116] UNGASS, UNGASS Country Progress Report: Azerbaijan. 2010.

[117] Kechin, E.A., Studies conducted within the National System for monitoring and evaluation of HIV/AIDS in the Republic of Belarus in 2009: a collection of articles, E.A. Kechin, Editor 2010, State Republican Center of Hygiene, Epidemiology and Public Health: Minsk.

[118] UNGASS, Republic of Belarus: National Report on the Implementation of the Declaration of Committment on HIV/AIDS., United Nations General Assembly Special Session on HIV/AIDS, Editor 2008: Minsk.

[119] Wilson TE, S.A., Zilmer K, Kalikova N, Uusküla A., The HIV prevention needs of injection drug users in Estonia. *International Journal of STD & AIDS*., 2007. 18(6): p. 389 – 91.

[120] UNGASS, UNGASS Country Progress Report: Estonia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[121] Uuskula, A., et al., Emergent properties of HIV risk among injection drug users in Tallinn, Estonia: synthesis of individual and neighbourhood-level factors. (Special Issue: Epidemiology and prevention of STDs: the role of emergent properties and structural patterns). *Sexually Transmitted Infections,* 2010. 86(Suppl. 3): p. iii79 – iii84.

[122] Todadze K, L.G., Implementation of drug substitution therapy in Georgia. *Central European Journal of Public Health*, 2008. 16(3): p. 121 – 123.

[123] Dershem, L., et al., Characteristics, high-risk behaviors and knowledge of STI / HIV / *AIDS,* and STI / HIV prevalence of facility-based female sex workers in Batumi, Georgia: 2004 – 2006. Report on two behavioral surveillance surveys with a biomarker component for the SHIP Project. USAID Cooperative Agreement No. 114 – A-00 – 02 – 00095 – 002007: [Tbilisi], Georgia, *Save the Children,* 2007 Sep. [59]

[124] UNGASS, UNGASS Country Progress Report: Latvia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[125] UNGASS, UNGASS Country Progress Report: Republic of Moldova, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Chisinau.

[126] Abdala, N., et al., *Sexually Transmitted Infections,* Sexual Risk Behaviors and the Risk of Heterosexual Spread of HIV among and beyond IDUs in St. Petersburg, Russia. *European Addiction Research,* 2008. 14(1): p. 19 – 25.

[127] Gyarmathy, V.A., et al., Correlates of Unsafe Equipment Sharing among Injecting Drug Users in St. Petersburg, Russia. *European Addiction Research,* 2009. 15(3): p. 163 – 170.

[128] Shaboltas, A.V., et al., HIV Prevalence, Sociodemographic, and Behavioral Correlates and Recruitment Methods Among Injection Drug Users in St. Petersburg, Russia. *Journal of Acquired Immune Deficiency Syndromes,* 2006. 41(5): p. 657 – 663 10.1097/01.qai.0000220166.56866.22.

[129] Raj, A., et al., Correlates of Any Condom Use Among Russian Narcology Patients Reporting Recent Unprotected Sex. *AIDS and Behavior,* 2008. 13(2): p. 310 – 317.

[130] Country Report of the Russian Federation on the Implentation of the Declaration of Committment on HIV/AIDS, United Nations General Assembly Special Session on HIV/AIDS, Editor 2008.

[131] Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being, M.o.H.a.S.D.o.t.R.F., Country Progress Report of the Russian Federation on the Implementation of the Declaration of Commitment on HIV/AIDS, 2010: Moscow.

[132] Gyarmathy, V.A., et al., Unprotected Sex in Heterosexual Partnerships of Injecting Drug Users in St. Petersburg, Russia. *European Addiction Research,* 2011. 15(1): p. 58 – 64.

[133] Niccolai, L.M., et al., The potential for bridging of HIV transmission in the Russian Federation: sex risk behaviors and HIV prevalence among drug users (DUs) and their non-DU sex partners. *Journal of Urban Health,* 2009. 86 Suppl 1: p. 131 – 43.

[134] Booth RE, K.C., Brewster JT, Sinitsyna L, Dvoryak S., Predictors of HIV sero-status among drug injectors at three Ukraine sites. *AIDS,* 2006. 20(17): p. 2217 – 23.

[135] SOCIS-CSPS, I.I.H.A.A.i.U., *Monitoring the Behaviour of Injecting Drug Users*, 2008: Kyiv.

[136] Booth, R.E., et al., Individual and Network Interventions With Injection Drug Users in 5 Ukraine Cities. *American Journal of Public Health,* 2011. 101(2): p. 336 – 343.

[137] Robbins, C.L., et al., Multicity HIV seroprevalence in street youth, Ukraine. *International Journal of STD & AIDS,* 2010. 21(7): p. 489 – 496.

[138] Sanchez JL, T.C., Bautista CT, Botros BA, Khakimov MM, Giyasova GM, Yakubov SK, Abdulaeva MA, Saad MD, Graham RR, Carr JK, Earhart KC., High HIV prevalence and risk factors among injection drug users in Tashkent, Uzbekistan, 2003 – 2004. *Drug and Alcohol Dependence,* 2006. 82: p. S15 – S22.

[139] Kryukova, V., Overview of epidemiological situation & national response to HIV-infection epidemic in Central Asian countries, in 4th Central Asian HIV Partnership Forum2009.

[140] Inogamov, Z., I., State of the HIV epidemic in the Republic of Uzbekistan Results of the SS in 2007: The results of sentinel surveillance of HIV infection among injecting drug users in 14 sentinel sites of the Republic of Uzbekistan, 2007., 2008: Tashkent.

[141] Family Health International (FHI), Albania—Behavioral and Biological Surveillance Study Report, 2006.

[142] UNGASS, National AIDS Program: UNGASS Country Progress Report: Albania, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[143] UNICEF, Biological and Behavioural Survey among Injection Drug Users, Bosnia and Herzegovina, 2007, UNICEF Bosnia and Herzegovina.

[144] Baćak, V., Midžić, D., Puhalo, A., Petrović, R., Report on behavioral and biological surveillance among injection drug users in Bosnia and Herzegovina, 2009: A respondent driven sampling survey, 2009.

[145] UNGASS, Country Progress Report on Monitoring the Declaration of Committment on HIV/AIDS: Republic of Bulgaria, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[146] Gjenero-Margan, I., Kolari, B., Epidemiology of HIV Infection and AIDS in Croatia—An Overview. *Collegium Antropologicum*, 2006: p. 11 – 16.

[147] Begovac, J., Zekan, Šime, Skoko-Poljak, Dunja, Twenty Years of Human Immunodeficiency Virus Infection in Croatia—An Epidemic that is Still in an Early Stage. Antropol., 2006. 30: p. 17 – 23.

[148] UNGASS, UNGASS Country Progress Report: Republic of Croatia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[149] UNGASS, UNGASS Country Progress Report: Hungary, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[150] Family Health International (FHI), I., Behavioural and Biological Survey Kosovo 2006, 2006.

[151] UNGASS, UNGASS Country Progress Report: Republic of Macedonia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[152] UNGASS, UNGASS Country Progress Report: Montenegro, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[153] United Nations Office on Drugs and Crime (UNODC), HIV, HBV and HCV Behavioral Surveillance Survey among Injecting Drug Users in Bucharest, Romania, 2010: Bucharest.

[154] UNGASS, UNGASS Country Progress Report: Republic of Serbia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[155] UNGASS, UNGASS Country Progress Report: Slovenia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[156] ICON Institute for Public Health, Operational Research on key STIs and HIV in Turkey, 2007: Ankara.

[157] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2007, 2007, Saint-Maurice: Institut de Veille Sanitaire.

[158] World Health Organisation (WHO). Total Population. 2006; Available from: http://www.who.int/countries/en/.

[159] European Centre for Disease Prevention and Control/WHO Regional Office for Europe, HIV/AIDS surveillance in Europe 2010, 2011, European Centre for Disease Prevention and Control: Stockholm.

[160] Department of Health and Social Development of Russian Federation, F.S.f.S.o.C.P.a.H.W., Federal Government Central Science Research Agency Institute of Epidemiology, Federal Research and Methodological Center for Prevention and Control of *AIDS, HIV Infection Newsletter № 35*, 2011: Moscow

[161] Platt, L., et al., High HIV prevalence among injecting drug users in Estonia: implications for understanding the risk environment. *AIDS,* 2006. 20(16): p. 2120 – 2123.

[162] Platt, L., et al., Changes in HIV prevalence and risk among new injecting drug users in a Russian city of high HIV prevalence. *Journal of Acquired Immune Deficiency Syndrome*, 2008. 47(5): p. 623 – 631.

[163] Stachowiak JA, T.F., Strathdee SA, Stibich MA, Latypov A, Mogilnii V, Beyrer C., Marked ethnic differences in HIV prevalence and risk behaviors among injection drug users in Dushanbe, Tajikistan, 2004. *Drug and Alcohol Dependence,* 2006. 82: p. S7 – S14.

[164] Niccolai, L.M., et al., High HIV Prevalence, Suboptimal HIV Testing, and Low Knowledge of HIV-Positive Serostatus Among Injection Drug Users in St. Petersburg, Russia. *AIDS and Behavior,* 2010. 14(4): p. 932 – 941.

[165] Uusküla, A., Des Jarlais, D., Kals, M., Abel-Ollo, K., Talu, A., Rüütel, K., Sobolev I., Outcomes of large-scale syringe exchange in Tallinn, Estonia, in XVIII International AIDS Conference2010: Vienna, Austria.

[166] Varban, M., Dovbakh, A., Maksymenko, K., Violence of sexual partner as a vulnerability factor of female IDU to HIV infection, in XVIII International AIDS Conference 2010: Vienna, Austria.

[167] Roberts, A., Mathers, B., Degenhardt, L., Transition to injection: an examination of the HIV risks and contexts of women's initiation to injection drug use, in XVIII International AIDS Conference2010: Vienna, Austria.

[168] Rhodes, T., Sarang, A., Simic, M., Police violence and 'fear-based policy' as barriers to HIV prevention: qualitative case studies in Russia and Serbia, in XVIII International AIDS Conference2010: Vienna, Austria.

[169] Rhodes, T., et al., Trust, disruption and responsibility in accounts of injecting equipment sharing and hepatitis C risk. *Health, Risk & Society,* 2008. 10(3): p. 221 – 240.

[170] Des Jarlais, D.C., Bramson, H., Wong, C., Gostnell, K., Hagan, H., Meta-analysis of the international literature on racial/ethnic disparities in HIV infection among IDUs: first results, in XVIII International AIDS Conference 2010: Vienna, Austria.

[171] Ursan, M., Bocai, A., Iliuta, C., Corciova, M., Harm Reduction Initiative for Roma Injecting Drug Users, in International Harm Reduction Conference 2009: Bangkok.

[172] Latypov, A., Understanding post 9/11 drug control policy and politics in Central Asia. *International Journal of Drug Policy,* 2009. 20(5): p. 387 – 391.

[173] Bobrova, N., et al., Barriers to accessing drug treatment in Russia: a qualitative study among injecting drug users in two cities. *Drug and alcohol dependence,* 2006. 82: p. S57 – S63.

[174] Platt, L., et al., Measuring risk of HIV and HCV among injecting drug users in the Russian Federation. *The European Journal of Public Health,* 2009. 19(4): p. 428 – 433.

[175] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Statistical bulletin 2011. 2011; Available from: http://www.emcdda.europa.eu/stats11.

[176] March JC, O.-J.E., Romero M., Inconsistent condom use among socially excluded heroin users. Gac Sanit. , 2007. 21(4): p. 321 – 8.

[177] Bravo, M.J., et al., Use of supervised injection facilities and injection risk behaviours among young drug injectors. *Addiction,* 2009. 104(4): p. 614 – 619.

[178] Etcheverry, M.F., et al., Pilot Study Assessing HIV Vaccine Trial Readiness Among Female Sex Workers, Injection and Non-injection Drug Users, and Men Who Have Sex with Men in Spain. *AIDS and Behavior,* 2010. 14(3): p. 607 – 617.

[179] UNGASS Country Progress Report 2010: Sweden, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[180] Dubois-Arber F, B.H., Huissoud T, Zobel F, Arnaud S, Samitca S, Jeannin A, Schnoz D, Gervasoni JP., Trends in drug consumption and risk of transmission of HIV and hepatitis C virus among injecting drug users in Switzerland, 1993 – 2006. *Eurosurveillance,* 2008. 13(22).

[181] Judd, A., et al., Incidence of hepatitis C virus and HIV among new injecting drug users in London: prospective cohort study. *BMJ,* 2005. 330(7481): p. 24 – 25.

[182] UNGASS, UNGASS Country Progress Report: Bosnia and Herzegovina, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[183] Racz, J., Injecting drug use, risk behaviour and risk environment in Hungary: A qualitative analysis. *International Journal of Drug Policy,* 2005. 16(5): p. 353 – 362.

[184] UNGASS Country Progress Report: Romania, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[185] Rhodes, T., et al., Police violence and sexual risk among female and transvestite sex workers in Serbia: qualitative study. *BMJ,* 2008. 337(7669).

[186] UNGASS, Republic of Belarus: National Report on the Implementation of the Declaration of Committment on HIV/AIDS., United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Minsk.

[187] Uusküla, A., et al., Surveillance of HIV, Hepatitis B Virus, and Hepatitis C Virus in an Estonian Injection Drug–Using Population: Sensitivity and Specificity of Testing Syringes for Public Health Surveillance. *Journal of Infectious Diseases,* 2006. 193(3): p. 455 – 457.

[188] Georgia: Country Progress Report, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[189] Save The Children, T.-C.f.I.a.C.o.R.H., Infectious Diseases, AIDS and Clinical Immunology Research Center, Characteristics, High-Risk Behaviours and Knowledge of STI/HIV/AIDS, and Prevalence of HIV, Syphilis and Hepatitis Among MSM in Tbilisi, Georgia: 2007, 2008, PATH, USAID.

[190] UNGASS, UNGASS 2010 Country Report: Kazakhstan.

[191] UNGASS, UNGASS 2010 Country Progress Report: Lithuania. 2010.

[192] Badrieva, L., et al., Lower injection-related HIV-1 risk associated with participation in a harm reduction program in Kazan, Russia. *AIDS Education and Prevention*, 2007. 19(1): p. 11.

[193] Samet, J.H., et al., Mitigating risky sexual behaviors among Russian narcology hospital patients: the PREVENT (Partnership to Reduce the Epidemic Via Engagement in Narcology Treatment) randomized controlled trial. *Addiction,* 2008. 103(9): p. 1474 – 1483.

[194] Walley, A.Y., et al., Implications of Cannabis Use and Heavy Alcohol Use on HIV Drug Risk Behaviors in Russian Heroin Users. *AIDS and Behavior,* 2007. 12(4): p. 662 – 669.

[195] Russian Federation Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being, Country Report of the Russian Federation on the Implentation of the Declaration of Committment on HIV/AIDS, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Moscow.

[196] Gyarmathy, V.A., et al., Injecting Equipment Sharing in Russian Drug Injecting Dyads. *AIDS and Behavior,* 2010. 14(1): p. 141 – 151.

[197] Cepeda, J., Odinokova, V., Heimer, R., Grau, L., Kolesnichenko, A., Lyubimova, A., Safiulina, L., Levina, O., Niccolai, L., Injecting drug network size, stability, and trust among injecting drug users in St. Petersburg Russia are significantly associated with HIV-risk behaviours, in XVIII International AIDS Conference 2010: Vienna, Austria.

[198] Booth, C.L., et al., Prevalence and predictors of antiretroviral drug resistance in newly diagnosed HIV-1 infection. *Journal of Antimicrobial Chemotherapy*, 2007. 59(3): p. 517 – 524.

[199] UNGASS, National Report on Monitoring Progress Towards the UNGASS Declaration of Commitment on HIV/AIDS: Ukraine, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Kyiv.

[200] UNGASS, UNGASS 2010 Country Progress Report: Uzbekistan. 2010.

[201] March, J., et al., Controlled trial of prescribed heroin in the treatment of opioid addiction. *Journal of Substance Abuse Treatment,* 2006. 31(2): p. 203 – 211.

[202] Folch, C., et al., Social characteristics, risk behaviours and differences in the prevalence of HIV/sexually transmitted infections between Spanish and inmigrant female sex workers in Catalonia, Spain. [Spanish]. *Medicina Clinica,* 2009. 132(10): p. 385 – 388.

[203] de la Fuente, L., et al., Increasing Early Diagnosis of HIV through Rapid Testing in a Street Outreach Program in Spain. *AIDS Patient Care and STDs*, 2009. 23(8): p. 625 – 629.

[204] Hurtado, I., et al., Trends in HIV testing, serial HIV prevalence and HIV incidence among people attending a Center for AIDS Prevention from 1988 to 2003. *Sexually Transmitted Infections,* 2006. 83(1): p. 23 – 28.

[205] Folch, et al., Factors associated with unprotected sexual intercourse with steady male, casual male, and female partners among men who have sex with men in Barcelona, Spain. Vol. 18. 2006, New York, NY, ETATS-UNIS: Guilford. 16.

[206] Booth RE, L.W., Brewster JT, Sinitsyna L, Dvoryak S., Gender Differences in Sex Risk Behaviors Among Ukraine Injection Drug Users. *Journal of Acquired Immune Deficiency Syndrome.*, 2007. 46(1): p. 112 – 7.

Chapter 3.2 Sex Workers

[1] Donoghoe, M.C., Stengaard, A.R., Access to antiretroviral therapy (ART) for injecting drug users in the WHO European Region 2002 – 2008, in XVIII International AIDS Conference 2010: Vienna, Austria.

[2] UNAIDS, Sex work, HIV/AIDS: A technical update. 2002.

[3] Tampep and L. Brussa, Sex Work In Europe: A mapping of the prostitution scene in 25 countries, in Sex Work, Migration and Health, T. International, Editor. 2009, Tampep International: Amsterdam.

[4] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working sex workers in London: the effect of migration from Eastern Europe. In press, 2011.

[5] Day, S. and H. Ward, Approaching health through the prism of stigma: research in seven European countries, in Sex work, mobility and health in Europe, H.W.S. Day, Editor. 2006, Kegan Paul: London.

[6] Creighton, S., S. Tariq, and G. Perry, Sexually transmitted infections among United Kingdom street-based sex workers. *Sexually Transmitted Infections,* 2008. 84(1): p. 32 – 33.

[7] Trani, F., et al., Female sex street workers and sexually transmitted infections: Their knowledge and behaviour in Italy. *Journal of Infection*, 2006. 52(4): p. 269 – 275.

[8] Wiessing, L., et al., EMCDDA annual report 2009: cocaine and heroin maintain firm hold on Europe's drug scene. *Eurosurveillance,* 2009. 14(46).

[9] Cwikel, J.G., et al., Sexually transmissible infections among illegal female sex workers in Israel. *Sexual Health,* 2006. 3(4): p. 301 – 303.

[10] Linhart, Y., et al., Sexually transmitted infections among brothel-based sex workers in Tel-Aviv area, Israel: High prevalence of pharyngeal gonorrhoea. *International Journal of STD and AIDS,* 2008. 19(10): p. 656 – 659.

[11] Smolskaya, T.T., et al., HIV sentinel surveillance in high-risk groups in Azerbaijan, the Reubplic of Moldova and the Russian Federation WHO Regional Office for Europe, Editor. 2004, WHO: Copenhagen.

[12] Shakarishvili, A., et al., Sex work, drug use, HIV infection, and spread of sexually transmitted infections in Moscow, Russian Federation. *The Lancet,* 2005. 366(9479): p. 57 – 60.

[13] Platt, L., et al., Impact of Gender and Sex Work on Sexual and Injecting Risk Behaviors and Their Association With HIV Positivity Among Injecting Drug Users in an HIV Epidemic in Togliatti City, Russian Federation. *Sexually Transmitted Diseases,* 2005. 32(10): p. 605 – 612.

[14] Platt, L., et al., Effects of sex work on the prevalence of syphilis among injection drug users in 3 Russian cities. *American Journal of Public Health,* 2007. 97(3): p. 478 – 485.

[15] Sergeyev, B. and A. Fedorova, Russian Federation (2006): HIV / AIDS TRaC study among health services and health providers targeting high-risk groups in St. Petersburg. First round. Social Marketing Research Series;PSI Dashboard. 2006: Washington, D.C., PSI, Research Division, 2006. 35.

[16] Gazi, H., et al., Prevalence of Chlamydia trachomatis/Neisseria gonorrhoeae and human papilloma virus among women-at risk in the Aegian region of Turkey, and their knowledge about HIV/AIDS. *West Indian Medical Journal*, 2008. 57(4): p. 398 – 402.

[17] Family Health International, 2006 Behavioural and Biological Surveillance Study Kosova, in Impact: Implementing AIDS Preventing and Care Project. 2007, Family Health International.

[18] Bruckova, M., et al., HIV infection among commercial sex workers and injecting drug users in the Czech Republic. *American Journal of Tropical Medicine and Hygiene,* 2006. 75(5): p. 1017 – 1020.

[19] van Veen, M.G., et al., HIV and Sexual Risk Behavior among Commercial Sex Workers in the Netherlands. *Archives of Sexual Behavior,* 2010. 39(3): p. 714 – 723.

[20] Papadogeorgaki, H., et al., Prevalence of sexually transmitted infections in female sex workers in Athens, Greece – 2005. *European Journal of Dermatology,* 2006. 16(6): p. 662 – 665.

[21] Vall-Mayans, M., et al., Sexually transmitted Chlamydia trachomatis, Neisseria gonorrhoeae, and HIV-1 infections in two at-risk populations in Barcelona: female street prostitutes and STI clinic attendees. *International Journal of Infectious Diseases,* 2007. 11(2): p. 115 – 122.

[22] Church, S., et al., Violence by clients towards female prostitutes in different work setting: questionnaire survey. *BMJ,* 2001. 322: p. 524 – 525.

[23] Sanders, T. and R. Campbell, Designing out vulnerability, building in respect: violence, safety and sex work policy. Br J Sociol, 2007. 58(1): p. 1 – 19.

[24] International AIDS Alliance, Behavioural monitoring and HIV infection prevalence among female sex workers as a component of second generation surveillance. 2009, International AIDS Alliance: Kiev.

[25] Jeal, N. and C. Salisbury, Health needs and service use of parlour-based prostitutes compared with street-based prostitutes: a cross-sectional survey. Bjog, 2007. 114(7): p. 875 – 81.

[26] Sexton, S., Over the Parapet: a short study into the needs and aspirations of sex workers in Edinbrugh, SCOT-PEP, Editor. 2009: Edinburgh.

[27] Belza, M.J., Prevalence of HIV, HTLV-I and HTLV-II among female sex workers in Spain, 2000 – 2001. *European Journal of Epidemiology,* 2004. 19(3): p. 279 – 82.

[28] Folch, C., et al., Prevalence of human immunodeficiency virus, Chlamydia trachomatis, and Neisseria gonorrhoeae and risk factors for sexually transmitted infections among immigrant female sex workers in Catalonia, Spain. *Sexually Transmitted Diseases,* 2008. 35(2): p. 178 – 183.

[29] Matteelli, A., et al., Chlamydia trachomatis genital infection in migrant female sex workers in Italy. *International Journal of STD & AIDS,* 2003. 14(9): p. 591 – 5.

[30] Ward, H., et al., Declining prevalence of STI in the London sex industry, 1985 to 2002. *Sexually Transmitted Infections,* 2004. 80(5): p. 374 – 6.

[31] UNFPA and UNICEF, Consultation on strategic information and HIV prevention among most-at-risk adolescents: Research Tool-kit. 2009.

[32] Kyrychenko, P. and V. Polonets, High HIV risk profile among female commercial sex workers in Vinnitsa, Ukraine. *Sexually Transmitted Infections,* 2005. 81(2): p. 187 – 8.

[33] Smolskaya, T.T., et al., HIV Sentinel surveillance in high-risk groups in Azerbaijan, Republic of Moldova and in the Russian Federation 2003, WHO.

[34] Population Services International Research Division, Russian Federation (2006): HIV/AIDS TRaC Study among Injecting Drug Users in Samara and Saratov First Round, in Social Marketing Research Series. 2007, PSI: Moscow.

[35] Dershem, L., et al., Characteristics, high-risk behaviors and knowledge of STI / HIV / *AIDS,* and STI / HIV prevalence of street-based female sex workers in Tblisi, Georgia: 2004 – 2006. Report on three behavioral surveillance surveys with a biomarker component for the SHIP Project. USAID Cooperative Agreement No. 114 – A-00 – 02 – 00095 – 00. 2007: [Tbilisi], Georgia, *Save the Children,* 2007 Sep. [59]

[36] Uuskula, A., et al., A study on HIV and hepatitis C virus among commercial sex workers in Tallinn. *Sexually Transmitted Infections,* 2008. 84(3): p. 189 – 191.

[37] International Harm Reduction Development Program, Women, Harm Reduction, and HIV, in Assessment in Action. 2009, Open Society Institute.

[38] Cusick, L., A. Martin, and T. May, Vulnerability and involvement and in drug use and sex work. 2003, Home Office: London.

[39] Ward, H., et al., Health issues associated with increasing use of “crack” cocaine among female sex workers in London. *Sexually Transmitted Infections,* 2000. 76: p. 292 – 293.

[40] Sloss, C.M. and G.W. Harper, When street sex workers are mothers. *Archives of Sexual Behavior,* 2004. 33(4): p. 329 – 41.

[41] Bell, J. and L. Harvey-Dodds, Pregnancy and injecting drug use. *BMJ,* 2008. 336(7656): p. 1303 – 5.

[42] Gupta, P., L. Guglani, and D. Shah, Exploring the power of Powerpoint. Indian Pediatr, 2002. 39(6): p. 539 – 48.

[43] Dunkle, K.L., et al., Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *The Lancet,* 2004. 363(9419): p. 1415 – 21.

[44] Campbell, J.C., Health consequences of intimate partner violence. *The Lancet,* 2002. 359(9314): p. 1331 – 6.

[45] Watts, C., C. Zimmerman, and B. Roche, Violence against women and trafficking: a priority for HIV programmes? HIV/AIDS in Europe: moving from death sentence to chronic disease management, ed. S. Matic, J.V. Lazarus, and M.C. Donoghoe. 2006, Geneva: World Health Organisation.

[46] Watts, C. and C. Zimmerman, Violence against women: global scope and magnitude. *The Lancet,* 2002. 359(6): p. 1232 – 37.

[47] Rhodes, T., et al., Police violence and sexual risk among female and transvestite sex workers in Serbia: qualitative study. *BMJ,* 2008. 337(7669).

[48] Shannon, K., et al., Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ,* 2009. 339: p. b2939.

[49] Shannon, K., et al., Structural and environmental barriers to condom use negotiation with clients among female sex workers: implications for HIV-prevention strategies and policy. *American Journal of Public Health,* 2009. 99(4): p. 659 – 65.

[50] Simic, M. and T. Rhodes, Violence, dignity and HIV vulnerability: street sex work in Serbia. *Sociology of Health & Illness,* 2009. 31(1): p. 1 – 16.

[51] Scambler, G., Sex work stigma: Opportunist migrants in London. Sociology-the *Journal of the British Sociological Association*, 2007. 41(6): p. 1079 – 1096.

[52] Strathdee, S., Health risks and power among female sex workers in Moscow, *SIECUS Report,* Editor. 2005.

[53] Markosyan, K.M., et al., Correlates of HIV risk and preventive behaviors in Armenian female sex workers. *AIDS and Behavior,* 2007. 11(2): p. 325 – 334.

[54] Stulhofer, A., et al., Female sex work and HIV risks in Croatia. AIDS Care-Psychological and Socio-Medical Aspects of AIDS/Hiv, 2009. 21(11): p. 1439 – 1446.

[55] Baral, S., et al., Male sex workers in Moscow, Russia: a pilot study of demographics, substance use patterns, and prevalence of HIV-1 and sexually transmitted infections. *AIDS Care,* 2010. 22(1): p. 112 – 118.

[56] Crago, A.L., Arrest the violence. Human Rights abuses against sex workers in Central and Eastern Europe and Central Asia. 2009, Sex Workers' Rights Advocacy Network in Central and Eastern Europe and Central Asia.

[57] Gorry, J., K. Roen, and J. Reilly, Selling your self? The psychological impact of street sex work and factors affecting support seeking. *Health & Social Care in the Community*, 2010. 18(5): p. 492 – 9.

[58] Grenfell, P., et al. Eastern European women selling sex in London: social networks, agency and risk. in International Conference on the Reduction of Drug Related Harm. 2009. Bangkok.

[59] Sanders, T., A continuum of risk? The management of health, physical and emotional risks by female sex workers. *Sociology of Health & Illness*, 2004. 26(5): p. 557 – 74.

[60] Sanders, T., Behind the personal ads: the indoor sex markets in Britain. Sex Work Now, ed. R.O.N. Campbell, M. 2006: Willan Publishing, Cullompton.

[61] Cox, G. and T. Whitaker, Drug Use, Sex Work and the Risk Environment in Dublin. 2009, National Advisory Committee on Drugs.

[62] Whitaker, T., P. Ryan, and G. Cox, Stigmatization among drug-using sex workers accessing support services in Dublin. *Qualitative Health Research*, 2011. e pub.

[63] Rössler, W., et al., The mental health of female sex workers. *Acta Psychiatrica Scandinavica*, 2010. 122: p. 143 – 152.

[64] European Centre for Disease Prevention and Control, Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report. 2010, ECDC: Stockholm.

[65] Gutierrez, M., et al., Prevalence of HIV-1 non-B subtypes, syphilis, HTLV, and hepatitis B and C viruses among immigrant sex workers in Madrid, Spain. *Journal of Medical Virology,* 2004. 74(4): p. 521 – 7.

[66] Linhart, Y., et al., Sexually transmitted infections among brothel-based sex workers in Tel-Aviv area, Israel: high prevalence of pharyngeal gonorrhoea. *International Journal of STD & AIDS,* 2008. 19(10): p. 656 – 9.

[67] Nigro, L., et al., Prevalence of HIV and other sexually transmitted diseases among Colombian and Dominican female sex workers living in Catania, eastern Sicily. *Journal of Immigrant and Minority Health*, 2006. 8(4): p. 319 – 323.

[68] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2006, in HIV/AIDS Surveillance in Europe, EuroHIV, Editor. 2007, French Institute for Public Health Surveillance: Saint-Maurice.

[69] Nielsen, S., et al., STI rates and risk factors among female sex workers attending STI testing sites in Germany, in International Society for Sexually Transmitted Disease Research. 2011: Quebec.

[70] Day, S. and H. Ward, Approaching health through the prism of stigma: research in seven European countries, in Sex work, mobility and health in Europe, H.W.S. Day, Editor. 2004, Kegan Paul: London.

[71] Ola, T.M. and V. Wiwoloku, HIV prevalence, AIDS knowledge and sexual behaviour among female migrant sex workers in Palermo, Italy, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[72] Country Coordination Committee, R.o.K., UNGASS 2010 Country Progress Report, Republic of Kazakhstan. 2010: Almaty.

[73] UNGASS Country Progress Report: Bosnia and Herzegovina, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[74] Ministry of Health (2010). Research among populations at higher risk of HIV and among people living with HIV/AIDS. Basic results of surveillance research 2009 – 2010. Belgrade, Ministry of Health, Republic of Serbia.

[75] Gjenero-Morgan, I. and B. Kolarić, Epidemiology of HIV infection and AIDS in Croatia—An Overview. *Collegium Antropologicum* 2006. 30 (Supplement 2): p. 11 – 16.

[76] UNGASS Country Progress Report: Republic of Macedonia, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[77] Suleymanova, J., H. Gadirova, and S. Khasiyev. Seroepidemiological research of HIV, hepatitis B, C, syphilis and behavioural risk factors among most-at-risk groups in Azerbaijan. in XVIII International AIDS Conference. 2010. Vienna.

[78] Tsereteli, N. and G. Lomidze, Low HIV prevalence among female sex workers in two cities of Georgia—contributing factors, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[79] National Report on the Implementation of the Declaration of Commitment on HIV/AIDS: Lithuania, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010: Vilnius.

[80] Republic of Belarus: National Report on the Implementation of the Declaration of Committment on HIV/AIDS., United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010: Minsk.

[81] Country Report of the Russian Federation on the Implentation of the Declaration of Committment on HIV/AIDS, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2008.

[82] Rhodes, T., et al., Prevalence of HIV, hepatitis C and syphilis among injecting drug users in Russia: a multi-city study. *Addiction,* 2006. 101(2): p. 252 – 266.

[83] Lomax, N., et al., Management of a syphilis outbreak in street sex workers in east London. *Sexually Transmitted Infections,* 2006. 82(6): p. 437 – 8.

[84] Todd, C.S., et al., Prevalence and correlates of human immunodeficiency virus infection among female sex workers in Tashkent, Uzbekistan. *Sexually Transmitted Diseases,* 2006. 33(8): p. 496 – 501.

[85] Todd, C.S., et al., Prevalence and factors associated with human immunodeficiency virus infection among sex workers in Samarkand, Uzbekistan. *Sexually Transmitted Diseases,* 2009. 36(2): p. 70 – 2.

[86] Sethi, G., et al., HIV, *sexually transmitted infections,* and risk behaviours in male sex workers in London over a 10 year period. *Sexually Transmitted Infections,* 2006. 82(5): p. 359 – 363.

[87] Reference Group to the United Nations on HIV and Injecting Drug Use, Consensus Statement of the Reference Group to the United Nations on HIV and Injecting Drug Use 2010. 2010.

[88] Ongoeva, D., HIV-infection epidemiolgical analysis among sex workers in Central Asia. 2010: Oblast AIDS Centre, Kyrgystan.

[89] Kolemasova, S., Review of HIV prevention and risk factors associated with HIV infection among sex workers in Uzbekistan, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[90] Saleri, N., et al., Prevalence and incidence of syphilis among South American transgender sex workers in Northern Italy. *Sexually Transmitted Diseases,* 2006. 33(5): p. 334 – 5.

[91] Spizzichino, L., et al., HIV infection among immigrant sex workers in Rome: comparing men, women and transgenders in XVII International AIDS Conference. 2008: Mexico city, Mexico.

[92] Belza, M.J., Risk of HIV infection among male sex workers in Spain. *Sexually Transmitted Infections,* 2005. 81(1): p. 85 – 88.

[93] Mak, R.P., L. Van Renterghem, and A. Traen, Chlamydia trachomatis in female sex workers in Belgium: 1998 – 2003. *Sexually Transmitted Infections,* 2005. 81(1): p. 89 – 90.

[94] Hourihan, M., et al., Lessons from the syphilis outbreak in homosexual men in east London. *Sexually Transmitted Infections,* 2004. 80(6): p. 509 – 11.

[95] Leuridan, E., et al., Male sex workers in Antwerp, Belgium: A descriptive study. *International Journal of STD and AIDS,* 2005. 16(11): p. 744 – 748.

[96] Aral, S., O., et al., The social organization of commercial sex work in Moscow, Russia. *Sexually Transmitted Diseases,* 2003. 30(1): p. 39 – 45.

[97] Aral, S.O., et al., Commercial sex work, drug use, and sexually transmitted infections in St. Petersburg, Russia. *Social Science & Medicine,* 2005. 60(10): p. 2181 – 2190.

[98] Wasserheit, J.N. and S.O. Aral, The dynamic topology of sexually transmitted disease epidemics: implications for prevention strategies. *Journal of Infectious Diseases,* 1996. 174 Suppl 2: p. S201 – 13.

[99] Brunham, R.C. and F.A. Plummer, A general model of sexually transmitted disease epidemiology and its implications for control. Med Clin North Am, 1990. 74(6): p. 1339 – 52.

[100] D'Antuono, A., et al., Prevalence of STDs and HIV infection among immigrant sex workers attending an STD centre in Bologna, Italy. *Sexually Transmitted Infections,* 2001. 77(3): p. 220.

[101] Dershem, L., et al., Characteristics, high-risk behaviors and knowledge of STI / HIV / *AIDS,* and STI / HIV prevalence of facility-based female sex workers in Batumi, Georgia: 2004 – 2006. Report on two behavioral surveillance surveys with a biomarker component for the SHIP Project. USAID Cooperative Agreement No. 114 – A-00 – 02 – 00095 – 00. 2007: [Tbilisi], Georgia, *Save the Children,* 2007 Sep. [59]

[102] The United Kingdom Collaborative Group for HIV and STI Surveillance, Testing times. HIV and other sexually transmitted infections in the United Kingdom. 2007, H.P. Agency, Editor. 2007, Public Health England, Centre for Infections: London.

[103] Free, C., I. Roberts, and M. McGuire, Sex workers' accounts of condom use: implications for condom production, promotion and health policy. *Journal of Family Planning and Reproductive Health Care*, 2007. 33(2): p. 107 – 111.

[104] Spruyt, A., et al., Identifying condom users at risk for breakage and slippage: findings from three international sites. *American Journal of Public Health,* 1998. 88(2): p. 239 – 44.

[105] Messiah, A., et al., Condom breakage and slippage during heterosexual intercourse: a French national survey. French National Survey on Sexual Behavior Group (ACSF). *American Journal of Public Health,* 1997. 87(3): p. 421 – 4.

[106] Todd, C.S., et al., Prevalence and correlates of condom use and HIV testing among female sex workers in Tashkent, Uzbekistan: Implications for HIV transmission. *AIDS and Behavior,* 2007. 11(3): p. 435 – 442.

[107] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2005. 2006, Institut de veille sanitaire: Saint-Maurice.

[108] Ward, H. and S.E. Day, What happens to women who sell sex? Report of a unique occupational cohort. *Sexually Transmitted Infections,* 2006. 82(5): p. 413 – 7.

[109] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe. *Sexually Transmitted Infections,* 2011.

[110] Qyra, S.T., et al., Behavioral risk factors and prevalence of HIV and other STIs among female sex workers in Tirana, Albania. *New Microbiologica*, 2011. 34(1): p. 105 – 8.

[111] UNGASS, UNGASS Country Progress Report: Bosnia and Herzegovina, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[112] EuroHIV, Report on the EuroHIV 2006 survey on HIV and AIDS surveillance in the WHO European Region. 2007, Institut de veille sanitaire: Saint-Maurice.

[113] UNGASS, Country Progress Report on Monitoring the Declaration of Committment on HIV/AIDS: Republic of Bulgaria, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[114] Gjenero-Margan, I., Kolari, B., Epidemiology of HIV Infection and AIDS in Croatia—An Overview. *Collegium Antropologicum*, 2006: p. 11 – 16.

[115] Bruckova M, B.C., Graham RR, Maly M, Vandasova J, Presl J, Sumegh L, Chapman GD, Carr JK, Sanchez JL, Earhart KC., Short report: HIV infection among commercial sex workers and injecting drug users in the Czech Republic. *American Journal of Tropical Medicine and Hygiene,* 2006. 75(5): p. 1017 – 1020.

[116] UNGASS, UNGASS Country Progress Report: Republic of Macedonia, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[117] UNGASS, UNGASS Country Progress Report: Montenegro, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[118] Ministry of Health, Research among populations at higher risk to HIV and among people living with HIV/AIDS. Basic results of surveillance research 2009 – 2010. 2010, Ministry of Health, Republic of Serbia: Belgrade.

[119] Family Health International (FHI), Serbia—Behavioral and Biological Surveillance Study Report. 2006.

[120] ICON Institute for Public Health, Operational Research on key STIs and HIV in Turkey. 2007: Ankara.

[121] UNGASS, UNGASS Country Progress Report: Republic of Armenia, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[122] UNGASS, Country Progress Report: Republic of Armenia, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2008.

[123] Suleymanova, J., Gadirova, H., Khasiyev, S., Seroepidemiological research of HIV, hepatitis B, C, syphilis and behavioural risk factors among most-at-risk groups in Azerbaijan, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[124] Smolskaya, T.T., Yakovleva, A.A., Kasumov, V.K., Gheorgitsa, S.I. , HIV Sentinel Surveillance in High-Risk Groups in Azerbaijan, Republic of Moldova and in the Russian Federation. 2004, World Health Organisation (WHO), Europe.

[125] UNGASS, UNGASS Belarus 2010 Country Progress Report. 2010.

[126] UNGASS, UNGASS 2010 Country Progress Report: Lithuania. 2010.

[127] UNGASS, UNGASS Country Progress Report: Republic of Moldova, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010: Chisinau.

[128] Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being Ministry of Health and Social Development of the Russian Federation, Country Progress Report of the Russian Federation on the Implementation of the Declaration of Commitment on HIV/AIDS. 2010: Moscow.

[129] UNGASS, National Report on Monitoring Progress Towards the UNGASS Declaration of Commitment on HIV/AIDS: Ukraine, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010: Kyiv.

[130] Pohorila, N., Taran, Y., Kolodiy, I., Diyeva, T., Behavior monitoring and HIV-infection prevalence among injection drug users. 2010, ICF “International HIV/AIDS Alliance in Ukraine”: Kyiv.

[131] Diez, M., et al., HIV prevalence among men and transgender sex workers in Spain, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[132] UNGASS, UNGASS 2010 Country Progress Report Kyrgyzstan. 2010.

[133] USAID, USAID IDUs Georgia Tbiliis 2007. 2008.

[134] Sirmatel, F., et al., Chlamydia trachomatis antigen positivity in women in risk groups and its relationship with the use of antibiotics. Jpn *Journal of Infectious Diseases,* 2005. 58(1): p. 41 – 3.

[135] United Nations Office on Drugs and Crime (UNODC), HIV, HBV and HCV Behavioral Surveillance Survey among Injecting Drug Users in Bucharest, Romania. 2010: Bucharest.

[136] Ilić, D., S. Šipetić, and V. Bjegović, Risk of HIV infection among indoor and street sex workers and their use of health services in Belgrade, Serbia. Srpski arhiv za celokupno lekarstvo 2010 (3 – 4): p. 219 – 224.

[137] Markosyan, K., et al., A Randomized Controlled Trial of an HIV Prevention Intervention for Street-Based Female Sex Workers in Yerevan, Armenia: Preliminary Evidence of Efficacy. *AIDS and Behavior,* 2010. 14(3): p. 530 – 537.

[138] Sergeyev, B. and A. Fedorova, Russian Federation (2006): HIV / AIDS TRaC study among Street-Based Female Sex Workers in Samara and Saratov. Social Marketing Research Series; PSI Dashboard. 2006: Washington, D.C., PSI, Research Division, 2006. 27.

[139] Kyrychenko, P. and V. Polonets, High HIV risk profile among female commercial sex workers in Vinnitsa, Ukraine [13]. *Sexually Transmitted Infections,* 2005. 81(2): p. 187 – 188.

[140] Todd, C.S., et al., Utilization of contraception and abortion and its relationship to HIV infection among female sex workers in Tashkent, Uzbekistan. *Contraception*, 2006. 74(4): p. 318 – 323.

Chapter 3.3 Men who have sex with men

[1] Jin, F., et al., Unprotected anal intercourse, risk reduction behaviours, and subsequent HIV infection in a cohort of homosexual men. *AIDS,* 2009. 23(2): p. 243 – 252 10.1097/QAD.0b013e32831fb51a.

[2] del Romero, J., et al., Evaluating the risk of HIV transmission through unprotected orogenital sex. *AIDS,* 2002. 16(9): p. 1296 – 7.

[3] Vitinghoff, E., et al., Per-Contact Risk of Human Immunodificiency Virus Tramnsmision between Male Sexual Partners. American Journal of Epidemiology, 1999. 150(3): p. 306 – 311.

[4] Hurtado, I., Alastrue, I., Garcia de Olallo, P., Albiach, D., Martin, M., Perez-Hoyos, S., Intervencion preventiva en lugares de interaccion social de hombres que mantienen relaciones sexuales con otros hombres. Gaceta Sanitaria, 2010. 24(1): p. 78 – 80.

[5] Fernández-Dávila, P., Zaragoza Lorca, K., [Internet and sexual risk in men who have sex with men]. *Gaceta Sanitaria*, 2009. 23(5): p. 380 – 7.

[6] Folch C, M.R., Zaragoza K, Casabona J., Sexual risk behaviour and its determinants among men who have sex with men in Catalonia, Spain2009, Saint-Maurice, FRANCE: Centre européan pour la surveillance épidémiologique du sida. 7.

[7] Hurtado Navarro, I., et al., Differences between women and men in serial HIV prevalence and incidence trends. *European Journal of Epidemiology,* 2008. 23(6): p. 435 – 440.

[8] Schwappach, D.L.B. and P. Bruggmann, An integrated model of care to counter high incidence of HIV and sexually transmitted diseases in men who have sex with men—initial analysis of service utilizers in Zurich. *BMJ, Public Health*, 2008. 8.

[9] Prasad, L.R., et al., Changing epidemiology of HIV anonymous testing in Switzerland for 1996 – 2006. *Swiss Medical Weekly,* 2009. 139(17 – 18): p. 256 – 63.

[10] Adam, P.C.G., I. Teva, and J.B.F. de Wit, Balancing risk and pleasure: sexual self-control as a moderator of the influence of sexual desires on sexual risk-taking in men who have sex with men. *Sexually Transmitted Infections,* 2008. 84(6): p. 463 – 467.

[11] van der Bij, A.K., Stolte, I.G., Coutinho, R.A., Dukers, N.H.T.M., Increase of *sexually transmitted infections,* but not HIV, among young homosexual men in Amsterdam: are STIs still reliable markers for HIV transmission? *Sexually Transmitted Infections,* 2005. 81: p. 34 – 37.

[12] Dukers, N.H.T.M., et al., HIV incidence and HIV testing behavior in men who have sex with men: using three incidence sources, The Netherlands, 1984 – 2005. *AIDS,* 2007. 21(4): p. 491 – 9.

[13] Stolte, I.G., et al., Low HIV-testing rates among younger high-risk homosexual men in Amsterdam. *Sexually Transmitted Infections,* 2007. 83: p. 387 – 91.

[14] Brown, A.E., et al., Implications for HIV testing policy derived from combining data on voluntary confidential testing with viral sequences and serological analyses. *Sexually Transmitted Infections,* 2009. 85(1): p. 4 – 9.

[15] Macdonald, N., et al., Factors associated with HIV seroconversion in gay men in England at the start of the 21st century. *Sexually Transmitted Infections,* 2008. 84(1): p. 8 – 13.

[16] Arumainayagam, J., et al., Value of targeting at-risk populations at outreach venues: findings from a local sauna. *International Journal of STD & AIDS,* 2009. 20(9): p. 642 – 643.

[17] Mor, Z., et al., Gay men who engage in substance use and sexual risk behaviour: a dual-risk group with unique characteristics. *International Journal of STD & AIDS,* 2008. 19(10): p. 698 – 703.

[18] ICON Institute for Public Health, Operational Research on key STIs and HIV in Turkey, 2007: Ankara.

[19] Tripathi, A., Rüütel, K., Parker, R.D., HIV risk behaviour knowledge, substance use and unprotected sex in men who have sex with men in Tallinn, Estonia. Eurosurveillance 2009. 14(48).

[20] Baral, S., et al., Male sex workers in Moscow, Russia: a pilot study of demographics, substance use patterns, and prevalence of HIV-1 and sexually transmitted infections. *AIDS Care,* 2010. 22(1): p. 112 – 118.

[21] Mirandola, M., et al., HIV bio-behavioural survey among men who have sex with men in Barcelona, Bratislava, Bucharest, Ljubljana, Prague and Verona, 2008 – 2009. (Special Issue: HIV/AIDS and other sexually transmitted infections (STI) in men who have sex with men (MSM)—trends and behavioural surveillance.) *Eurosurveillance*, 2009. 14(48): p. 19427.

[22] Amirkhanian, Y.A., et al., HIV/STD PREVALENCE, RISK BEHAVIOR, AND SUBSTANCE USE PATTERNS AND PREDICTORS IN RUSSIAN AND HUNGARIAN SOCIOCENTRIC SOCIAL NETWORKS OF MEN WHO HAVE SEX WITH MEN. AIDS Education and Prevention, 2009. 21(3): p. 266 – 279.

[23] Sharra, E. and R. Bani, An analysis of HIV-related risk behaviors of Men Having Sex with Men (MSM), using respondent driven sampling (RDS), in Albania. Archives: *The International Journal of Medicine*, 2009. 2(2): p. 231 – 234.

[24] Kasianczuk, M.G., et al., Risk Factors Associated with Condom Use Among Men Who Have Sex with Men in Ukraine. *Journal of LGBT Health Research,* 2009. 5(1 – 2): p. 51 – 62.

[25] Save The Children, T.-C.f.I.a.C.o.R.H., Infectious Diseases, AIDS and Clinical Immunology Research Center, Characteristics, High-Risk Behaviours and Knowledge of STI/HIV/AIDS, and Prevalence of HIV, Syphilis and Hepatitis Among MSM in Tbilisi, Georgia: 2007, 2008, PATH, USAID.

[26] Štulhofer, A., et al., HIV-related Sexual Risk Taking Among HIV-negative Men Who Have Sex with Men in Zagreb, Croatia. *AIDS and Behavior,* 2008. 12(3): p. 505 – 512.

[27] Longfield, K., Astatke, H., Smith, R., McPeak, G., Ayers, J., Men who have sex with men in Southeastern Europe: Underground and at increased risk for HIV/STIs. *Culture, Health & Sexuality*, 2007. 9(5): p. 473.

[28] Meyer, et al., 'We are ordinary men': MSM identity categories in Tbilisi, Georgia. Culture, *Health and Sexuality*, 2010. 12(8):955-71.

[29] Population Services International Research Division, Russian Federation (2006): HIV/AIDS TRaC Study among Injecting Drug Users in Samara and Saratov First Round, in Social Marketing Research Series 2007, PSI: Moscow.

[30] Schmidt, A.J., Marcus, U., Mikolaychuk, M., Sekuler, T., Ferrer, L., Folch, C., Hickson, F., Reid, D., Weatherburn, P., Benvenuti, S., Breveglieri, M., Mirandola, M., Hospers, H.J, EMIS Community Report 1, 2010.

[31] Giuliani, M., et al., Increased HIV incidence among men who have sex with men in Rome. *AIDS,* 2005. 19(13): p. 1429 – 1431.

[32] Family Health International (FHI), Albania—Behavioral and Biological Surveillance Study Report, 2006.

[33] UNGASS, UNGASS Country Progress Report: Bosnia and Herzegovina, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[34] UNGASS, Country Progress Report on Monitoring the Declaration of Committment on HIV/AIDS: Republic of Bulgaria, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[35] Bozicevic, I., et al., Prevalence of sexually transmitted infections among men who have sex with men in Zagreb, Croatia. *AIDS and Behavior,* 2009. 13(2): p. 303 – 309.

[36] Gjenero-Margan, I., Kolari, B., Epidemiology of HIV Infection and AIDS in Croatia—An Overview. *Collegium Antropologicum*, 2006: p. 11 – 16.

[37] UNGASS, UNGASS Country Progress Report: Republic of Croatia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[38] UNGASS, UNGASS Country Progress Report: Hungary, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[39] UNGASS, UNGASS Country Progress Report: Republic of Macedonia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[40] Izdebski, Z., Research on men who have sex with men, 2004, TNS OBOP for National AIDS Centre: Warsaw.

[41] UNGASS, UNGASS Country Progress Report: Republic of Serbia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[42] Family Health International (FHI), Serbia—Behavioral and Biological Surveillance Study Report, 2006.

[43] UNGASS, UNGASS Country Progress Report: Slovenia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[44] UNGASS, UNGASS Country Progress Report: Republic of Armenia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[45] UNGASS, UNGASS Country Progress Report: Azerbaijan. 2010.

[46] UNGASS, Republic of Belarus: National Report on the Implementation of the Declaration of Committment on HIV/AIDS., United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Minsk.

[47] Kechin, E.A., Studies conducted within the National System for monitoring and evaluation of HIV/AIDS in the Republic of Belarus in 2009: a collection of articles, E.A. Kechin, Editor 2010, State Republican Center of Hygiene, Epidemiology and Public Health: Minsk.

[48] UNGASS, UNGASS Country Progress Report: Estonia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[49] UNGASS, UNGASS Country Progress Report: Georgia, 2010.

[50] Country Coordination Committee, R.o.K., UNGASS 2010 Country Progress Report, Republic of Kazakhstan, 2010: Almaty.

[51] UNGASS, UNGASS 2010 Country Progress Report: Lithuania. 2010.

[52] UNGASS, UNGASS Country Progress Report: Republic of Moldova, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Chisinau.

[53] Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being Ministry of Health and Social Development of the Russian Federation, Country Progress Report of the Russian Federation on the Implementation of the Declaration of Commitment on HIV/AIDS, 2010: Moscow.

[54] UNGASS, UNGASS 2008 Country Progress Report: Russian Federation. 2008.

[55] UNGASS, National Report on Monitoring Progress Towards the UNGASS Declaration of Commitment on HIV/AIDS: Ukraine, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Kyiv.

[56] UNGASS, UNGASS 2010 Country Progress Report: Uzbekistan. 2010.

[57] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2005., 2006, Institut de veille sanitaire: Saint-Maurice.

[58] Smolskaya, T.T., Yakovleva, A.A., Kasumov, V.K., Gheorgitsa, S.I. , HIV Sentinel Surveillance in High-Risk Groups in Azerbaijan, Republic of Moldova and in the Russian Federation, 2004, World Health Organisation (WHO), Europe.

[59] Ismailova, A., HIV-Infection situation analysis among MSM in Central Asia, 2010: Almaty.

[60] Velter, A., et al., HIV prevalence and HIV testing behaviour among men who attend commercial gay venues in Paris (France), PREVAGAY 2009 Survey. (Numero thematique—L'infection a VIH-side en France 2009: depistage, nouveaus diagnostics et incidence.) [French]. *Bulletin Epidemiologique Hebdomadaire*, 2010. 45(46): p. 464 – 467.

[61] Folch, C., Casabona, J., Munoz, R., Gonzalez, V., Zaragoza, K., Incremento en la prevalencia del VIH y en las conductas de riesgo asociadas en hombres que tienen sexo con hombres: 12 anos de encuestas de vigilancia conductual en Cataluna. *Gaceta Sanitaria*, 2010. 24(1): p. 40 – 46.

[62] Family Health International (FHI), I., Behavioural and Biological Survey Kosovo 2006, 2006.

[63] Balakireva, O.M., Bondar, T.V., Kasyanchuk, M.G., Kis, Z.R., Leschinskiy, E.V., Sheremet-Sheremetyev, S.P., Monitoring behaviour of men having sex with men as a component of second generation epidemiological surveillance, 2008, ICF "International HIV/AIDS Alliance in Ukraine": Kyiv.

[64] Rottingen, J.-A., D.W. Cameron, and G.P. Garnett, A systematic review of the epidemiologic interactions betwen classic sexually transmitted diseases and HIV. How much really is known? *Sexually Transmitted Diseases,* 2001. 28(10): p. 579 – 597.

[65] Williamson, L.M. and G.J. Hart, HIV prevalence and undiagnosed infection among a community sample of gay men in Scotland. *Journal of Acquired Immune Deficiency Syndromes,* 2007. 45(2): p. 224 – 230.

[66] Dodds, J.P., et al., A tale of three cities: persisting high HIV prevalence, risk behaviour and undiagnosed infection in community samples of men who have sex with men. *Sexually Transmitted Infections,* 2007. 83(5): p. 392 – 6.

[67] Cowan, et al., Hiv and risk behaviour among men who have sex with men in Denmark—The 2006 sex life survey. Eurosurveillance Vol. 13, Issue 48, 27 November 2008.

[68] Bouhnik, A.-D., et al., Unprotected sex in regular partnerships among homosexual men living with HIV: a comparison between sero-nonconcordant and seroconcordant couples (ANRS-EN12—VESPA Study). *AIDS,* 2007. 21: p. S43 – S48 10.1097/01.aids.0000255084.69846.97.

[69] Hospers, H.J., et al., A new meeting place: chatting on the Internet, e-dating and sexual risk behaviour among Dutch men who have sex with men. *AIDS,* 2005. 19(10): p. 1097 – 1101.

[70] Moreau-Gruet, F.D.-A., F.; Jeannin, A., Long-term HIV/AIDS-related prevention behaviours among men having sex with men: Switzerland 19922000. *AIDS Care,* 2006. 18: p. 35 – 43.

[71] Mercer, C.H., et al., Behaviourally bisexual men as a bridge population for HIV and sexually transmitted infections? Evidence from a national probability survey. *International Journal of STD & AIDS,* 2009. 20(2): p. 87 – 94.

[72] Frankis, J.S. and P. Flowers, Cruising for sex: Sexual risk behaviours and HIV testing of men who cruise, inside and outwith public sex environments (PSE). *AIDS Care,* 2006. 18(1): p. 54 – 59.

[73] Caplinskas, S., Caplinskiene, I., Gricius, A., Risk factors of HIV spread in Lithuanian men having sex with men (MSM) community., in 15th International Conference on AIDS 2004: Bangkok, Thailand.

[74] Reynolds, L., et al., HIV among men who have sex with men in Central and eastern Europe: A review of 30 countries, WHO, Editor 2011, WHO.

[75] Population Services International (PSI), LaSky Russia MSM, 2010.

[76] Population Services International, Study among men who have sex with men in Almaty, Bishkek, Chui and Dushanbe, 2010, Population Services International

[77] UNAIDS, An introduction to indicators: UNAIDS monitoring and evaluation fundamentals., 2010.

[78] Schmidt, A.J., Benvenuti, S., Breveglieri, M., Ferrer, L., Folch, C., Hicksonm F., Hospers, H.J., Marcus, U., Mikolaychuk, M., Mirandola, M., Reid, D., Weatherburn, P., for the EMIS consortium, The European MSM Internet Survey (EMIS) UNGASS indicators, 2010.

[79] Stvilia, K., Todadze, K., Nizharadze, G., HIV and AIDS in Georgia: a socio-cultural approach, in HIV and AIDS in the Caucusus Region: a socio-cultural approach2005, UNESCO.

[80] Costenbader, E., Otiashvili, D., Meyer, W., Zule, W., Orr, A., Kirtadze, I., Secrecy and risk among MSM in Tbilisi, Georgia. *AIDS Care,* 2009. 21: p. 591 – 597.

[81] Folch, et al., Factors associated with unprotected sexual intercourse with steady male, casual male, and female partners among men who have sex with men in Barcelona, Spain. Vol. 18. 2006, New York, NY, ETATS-UNIS: Guilford. 16.

[82] Balthasar, H., et al., Intentional Risk Reduction Practices of Men in Switzerland Who Have Anal Intercourse With Casual Male Partners. *Journal of Acquired Immune Deficiency Syndromes,* 2010. 54(5): p. 542 – 547 10.1097/QAI.0b013e3181e19a6b.

[83] Evans, A.R., et al., Central and east European migrant men who have sex with men: an exploration of sexual risk in the United Kingdom. *Sexually Transmitted Infections,* 2011. 87(4): p. 325 – 330.

[84] Leobon, A., et al., A relative profile of HIV-negative users of French websites for men seeking men and predictors of their regular risk taking: a comparison with HIV-positive users. *AIDS Care,* 2011. 23(1): p. 25 – 34.

[85] Mor, Z., et al., High-risk behaviour in steady and in casual relationships among men who have sex with men in Israel. *Sexually Transmitted Infections,* 2011. 87(6): p. 532 – 537.

[86] Sasse, A., et al., High HIV prevalence among patients choosing anonymous and free testing in Belgium, 1990 – 2002. *International Journal of Std & AIDS,* 2006. 17(12): p. 817 – 820.

[87] Berghe, W.v., et al., A venue-based HIV prevalence and behavioural study among men who have sex with men in Antwerp and Ghent, Flanders, Belgium, October 2009 to March 2010. *Eurosurveillance*, 2011. 16(28): p. 19914.

[88] Stolte, I.G., et al., Low HIV-testing rates among younger high-risk homosexual men in Amsterdam. *Sexually Transmitted Infections,* 2007. 83(5): p. 387 – 91.

[89] Williamson, L.M., et al., Sexual risk behaviour and knowledge of HIV status among community samples of gay men in the United Kingdom. *AIDS,* 2008. 22(9): p. 1063 – 70.

[90] Focus: HIV prevalence among non-IDU heterosexuals, IDUs, and men who have sex with men who undergo attributable HIV testing in Scotland: 2006 update. *HPS Weekly Report*, 2007. 41(30): 2007.

[91] McDaid L.M., H.G.J., Contact with HIV prevention services highest in gay and bisexual men at greatest risk: cross-sectional survey in Scotland. *BMC Public Health,* 2010. 10(pp 798).

[92] Health Protection Scotland, *HPS Weekly Report* 7 September 2007, 2007, NHS National Services Scotland.

[93] Health Protection Scotland, *HPS Weekly Report*, 2006, NHS National Services Scotland.

[94] UNGASS, National AIDS Program: UNGASS Country Progress Report: Albania, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[95] UNGASS, Belarus 2010 Country Progress Report. 2010.

[96] UNGASS, Belarus 2008 Country Progress Report.

[97] UNGASS, UNGASS 2010 country report: Kazakhstan. 2010.

[98] Russian Federation Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being, Country Report of the Russian Federation on the Implentation of the Declaration of Committment on HIV/AIDS, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Moscow.

[99] WHO, HIV prevalence and risk among men having sex with men in Moscow and Saint Petersburg, 2007, WHO Regional Office for Europe: Copenhagen.

[100] UNGASS, UNGASS Country Progress Report: Norway, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[101] Bonell, C.P., et al., Methamphetamine use among gay men across the United Kingdom. *International Journal of Drug Policy,* 2010. 21(3): p. 244 – 246.

[102] Hickson, F., et al., Illicit drug use among men who have sex with men in England and Wales. *Addiction Research & Theory*, 2010. 18(1): p. 14 – 22.

[103] Lattimore, S., et al., Changing patterns of sexual risk behavior among London gay men: 1998 – 2008. *Sexually Transmitted Diseases,* 2011. 38(3): p. 221 – 229.

Chapter 4

Responses to HIV in Key Populations

4.1 HIV Surveillance responses

As we noted in Chapter 2, HIV surveillance activities are generally well established in Europe. The availability of data on HIV diagnoses from almost the entire region is a particular strength. We earlier noted that two-thirds of countries have undertaken studies to monitor directly measured HIV prevalence or risk in at least two of the populations most affected by HIV. We consider here how HIV surveillance responses among key populations can be further strengthened.

4.1.1 Reporting HIV diagnoses

While comprehensive, data on HIV diagnoses are not without their limitations. They indicate the patterns and extent of diagnoses, but do not reflect the current patterns or extent of HIV transmission. This is because newly diagnosed HIV cases will include both new and past infections. Diagnoses reports also reflect the uptake of diagnostic testing for HIV, the effectiveness of case finding, and patterns of reporting, all of which will vary from country-to-country. Countries with the largest number of reported diagnosed could therefore be those most successful at case finding, rather than those with the worst epidemics. Countries across the region use different approaches to collate HIV diagnoses data, and these variations will affect data comparability.

Timeliness (reporting delay)

A European wide survey of HIV surveillance systems in 2006 in 44 countries found that among the 16 countries that had looked at reporting delay, [1] 75% of HIV diagnoses were reported within 6 months, while for 13 countries 90% of their diagnoses were reported within 6 months. Data can be adjusted if the extent and pattern of past reporting delay is known. All countries should regularly asses reporting delay and report this so that such adjustments can be made.

Completeness (under reporting)

The extent of under reporting is unknown. In the 2006 survey of European HIV surveillance systems, less than 40% of countries had assessed the extent of underreporting. [1] In those that had, underreporting ranged from less than 2% in Belarus to 37% in France. Furthermore, in two countries—Spain and Italy—diagnoses reporting systems currently do not have national coverage. All countries should periodically assess the extent of under reporting and publish estimates of this, and where this is found to be high—greater than 10%—efforts should be made to reduce this.

Duplication (over counting)

An individual may have more than one positive HIV test as a result of receiving healthcare indifferent settings or using an anonymous testing service then presenting for named test. Furthermore, a single

positive test could be reported more than once, for example, by both the laboratory undertaking the testing and the clinician. To overcome duplicative reporting, many systems collect identifiers, such as, a full name and date of birth, or a code identifier based on a combination of identification data. Identifiers are not always possible to collect, such as when testing is anonymous and when subject to privacy related legal restrictions. A survey of 40 European countries showed that 28 (72%) used a coded identifier and 12 (28%) used full names. [1] In countries where reports lack identifiers, the extent of over reporting should be assessed periodically.

Consistency of details on risk factors

The type and completeness of the information requested on cases, including risk factors, varies between countries. For example, in 2010 49 of the countries reporting data to ECDC/WHO data set [2] provided data on age, with an overall completeness ranging from 78% to 100% (99.3% overall), while only 34 countries provided data on country of birth, with completeness ranging from 1.5% to 100% (37% overall). For over a quarter of the diagnoses reported in Europe there is no information available on exposure category, and this is a concern. The proportion of diagnoses lacking exposure information is highest in the East and Centre, at over a third and a quarter respectively. Some countries, such as the United Kingdom, follow-up reports with missing exposure category information and these reports may then be revised. All countries should ensure that their systems collect information on exposure category (at a minimum the main risk), and aim to follow-up all reports where this is missing. All countries should also aim to collect an exposure sub-category for all reports associated with heterosexual exposure.

HIV testing practices

HIV testing practices have a direct effect on the extent to which HIV infections are diagnosed and reported. Approaches to HIV testing vary widely in the region, [3] but most countries have a policy or strategy to offer HIV testing and counselling to MSM, PWID and SW. [4 – 6] The 2006 survey found that 37 (84%) of the 44 countries routinely offered HIV testing to pregnant women; 32 (73%) did so for PWID; 26 (59%) did so for for patients of STI clinics; and 21 (48%) did so for TB patients. [1] However, testing was only routinely offered by health care providers to SW in 17 countries (39%) and to MSM in 16 countries (36%). [1] Mandatory HIV testing of blood donors was reported in all countries. [1] In addition, in a few countries mandatory HIV testing was reported among immigrants (Andorra, Azerbaijan, Russian Federation), military personnel (Croatia, Lithuania, Republic of Moldova, Romania, Ukraine), sex workers (Austria, Greece, Republic of Moldova and Turkey), and pregnant women (Czech Republic and Estonia). [1] A survey on testing strategies in Europe found that 14 countries (from 24 responders) had policies recommending provider-initiated opt-out testing in prenatal care and 12 in other settings, such as STI clinics or drug treatment centres (Russian Federation). [7] In addition 19 countries promote HIV testing through outreach, with PWID the most widely served population. [7] Testing is generally provided free of charge, even to non-residents, but free testing may be restricted to certain facilities. [7] Moreover, access to testing services varies between countries reflecting differences in perceptions of risk, levels of HIV related stigma and accessibility of HIV treatment and care. [4] In addition to ensuring ease of access to HIV testing, it is important for all countries to monitor the number of diagnostic HIV tests undertaken annually (distinguishing tests undertaken during blood screening and antenatal care, and excluding tests undertaken as part of unlinked anonymous studies).

Region wide collation of HIV case reports

Since 2008, the European Centre for Disease Prevention and Control (ECDC) and the World Health Organization Regional Office for Europe (WHO Regional Office) have been jointly collating HIV and AIDS data from across the European region. Case based data are submitted annually to a joint database, The European Surveillance System (TESSy). Four types of data on HIV/AIDS are collected in a standardised way: HIV case-based, HIV aggregated, AIDS case-based and HIV tests (aggregated). This standardised data collection system makes comparisons across the region easier, as well as improves data quality and consistency. It is important that this data collection is maintained. Every year by end November, ECDC and the WHO Regional Office jointly publish the data in the HIV/AIDS surveillance report.

Case Study 4.1 Use of HIV case reports to detect outbreaks

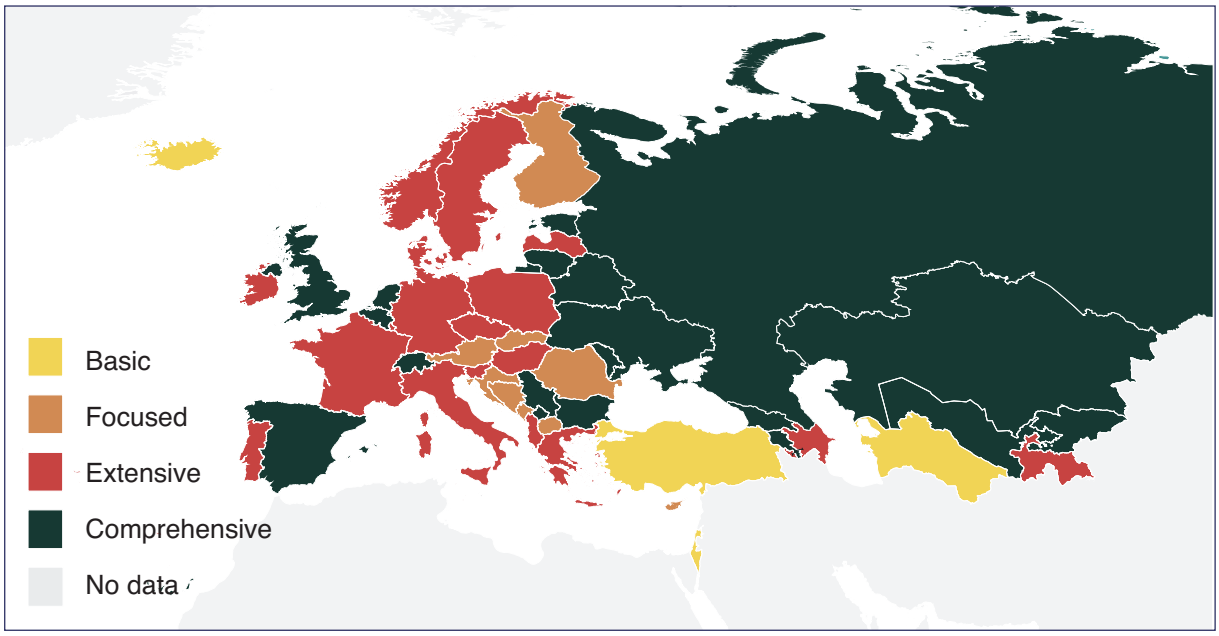
In 2011 increases in new diagnoses of HIV were reported in Greece and Romania. In Greece during the first 10 months of 2011, cases among PWID increased to 190. Historically, Greece has been a low prevalence country. Prior to 2010 between 2 – 5 cases of HIV attributed to injecting drug use were reported annually in Romania, but in 2010 this increased to 12 cases and in 2011 62 cases. Both countries maintain that surveillance has not changed over the time period ruling out the observed increases as a consequence of enhanced surveillance. A behavioural survey undertaken in Bucharest highlighted some changes in drug taking practices, suggesting increased use of amphetamine type stimulants in place of heroin, with reports of more frequent injection and needle/syringe sharing.

Causes of the outbreaks have been attributed to low coverage among PWID to OST in Greece and Romania which is low (<20 per 100 PWID, see Figure 4.8), as well as long waiting times for OST up to 7 years in Greece and ranging between 1 and 6 months in Romania as well as insufficient distribution of needle/syringes. The recent economic crisis has been blamed for increasing vulnerability of young people to drug use as necessitating a reduction in public health budgets and HIV prevention programmes in Europe.

While further epidemiological investigation is required to understand the extent of the outbreaks and associated risk factors, the benefit of HIV case reports in detecting outbreaks as well as the role of behavioural data to interpret changes is evident. Other countries such as Italy or Iceland who have been severely affected by the recession need to be carefully monitored and attempts to ensure that funding cuts do not affect the delivery of HIV prevention and treatment services.

4.1.2 Monitoring HIV in key populations

Figure 4.1 Monitoring of HIV prevalence or behaviours among MSM, PWID and SW



Source: Literature Review. See Appendix tables 2.A.7 – 10.
Note: All these countries have HIV case reporting systems.

Estimates of HIV prevalence derived directly from targeted studies among key populations of PWID, SW and MSM help generate more accurate indicators of current epidemic patterns than reliance on case reporting alone. Our analysis of the published literature indicates that around two-thirds of countries in Europe had undertaken studies to either directly measure HIV prevalence or risk behaviour behaviours in all three populations of PWID, SWs and MSM. However, only 18 had evidence suggestive of monitoring (that is, undertaking several studies over time that could provide repeated measures) of either HIV prevalence or risk behaviours in all three of these populations, while another 18 countries had evidence of this among two of these populations (Figure 4.1). No evidence suggesting monitoring among these populations was identified in five (10%) countries.

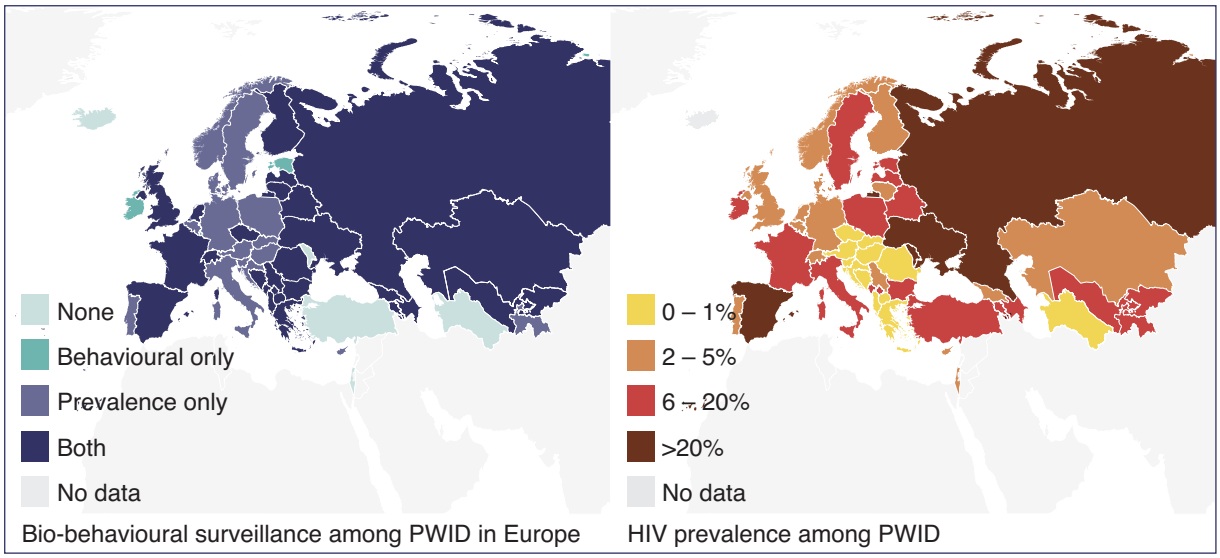
These findings should be interpreted cautiously as our literature review collated documents in English, French, Russian and Spanish only, and thus may under-estimate the extent to which surveys directly measure HIV prevalence or risk behaviours, including among other vulnerable and key populations such as migrants.

Second-generation HIV surveillance systems in countries with either a concentrated or a low-level epidemic, such as those found in the Europe, aim to combine monitoring of HIV diagnoses with monitoring of HIV prevalence and related risk in higher risk groups. The 50 countries we considered all had HIV case reporting systems. In a third of countries (18) there was evidence to suggest 'comprehensive' surveillance among PWID, MSM and SWs (i.e., monitoring HIV prevalence or risk in all three groups), in a third of countries (18) there was 'extensive' surveillance (i.e. monitoring HIV prevalence or risk in two of the groups), in nine 'focused' surveillance (i.e., monitoring HIV prevalence or risk in one of the groups), and in five had a 'basic' approach relying solely on HIV case reports (Figure 4.1).

4.1.3 MONITORING HIV AND THE LEVEL OF THE HIV EPIDEMIC

HIV prevalence was 5% or more in the best estimate studies of PWID in 21 of the countries where studies were identified. Of these, 18 had repeated studies monitoring HIV prevalence among PWID and 16 of risk behaviour (Figure 4.2). In one country (Turkey) of high prevalence (>5%) among PWID, there was no evidence found indicating the monitoring of prevalence or risk behaviour. In one country (Ireland) with prevalence over 5% (although the sample size was small) there was no evidence of repeated measures of HIV prevalence among PWID. The annual average of HIV diagnoses linked to injecting drug use was 8.8 per million people between 2006 and 2010; higher than the average linked to injecting in the rest of Europe (4 per million). Of the 14 countries with moderate HIV prevalence (>1% and <5%) among PWID, there was only one (Israel) with no evidence of targeted monitoring of either prevalence or risk behaviour. Studies among PWID to directly monitor risk therefore need to be implemented in two countries (Israel and Turkey), and require expanding in one (Ireland) to include monitoring of prevalence among PWID.

Figure 4.2 Monitoring HIV and risk among PWID and the extent of the HIV epidemic



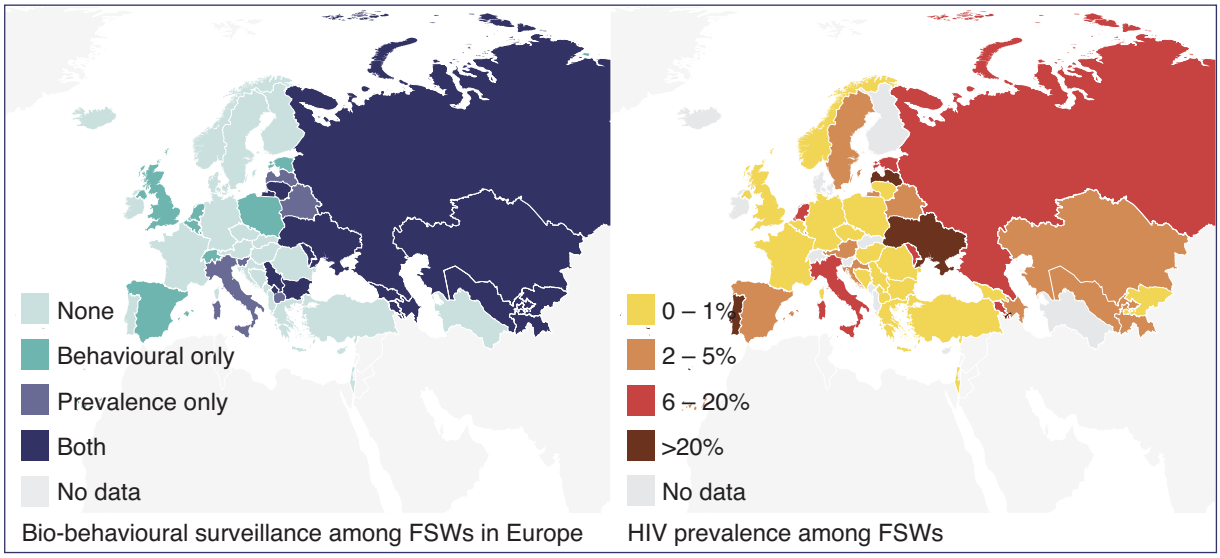
Source: Appendix 2.A.7.

In the ten countries with high HIV prevalence (>5%) among SWs, six had undertaken studies to monitor HIV prevalence using repeated studies and seven had undertaken studies to monitor risk behaviour. In two countries of high prevalence (>5%) among SWs (Portugal and Turkey), there was no evidence of direct monitoring of either HIV prevalence or risk behaviour. Of the 15 countries with moderate HIV prevalence (<1% and >5%) among SWs, four had no direct measures of prevalence or risk behaviours over time (Norway, Croatia, Czech Republic, and Romania). Studies to provide repeated measures among SWs thus need to be implemented in two countries (Portugal and Turkey), and improved in two countries (Estonia and Netherlands). This is particularly important given the lack of routine HIV/STI epidemiological data in relation to sex work in Europe. [8]

Studies of male SWs were only found in six countries across the region, all of which found high HIV prevalence (>5%). Three of these studies were conducted in the countries with the highest annual aver-

age HIV case reports per million between 2006 – 2010 (United Kingdom, Netherlands, Spain). Other countries with above annual average of cases among MSM (such as Portugal, Switzerland, Denmark, Ireland, Greece, France and Luxembourg) should consider implementing targeted prevalence studies among male SWs.

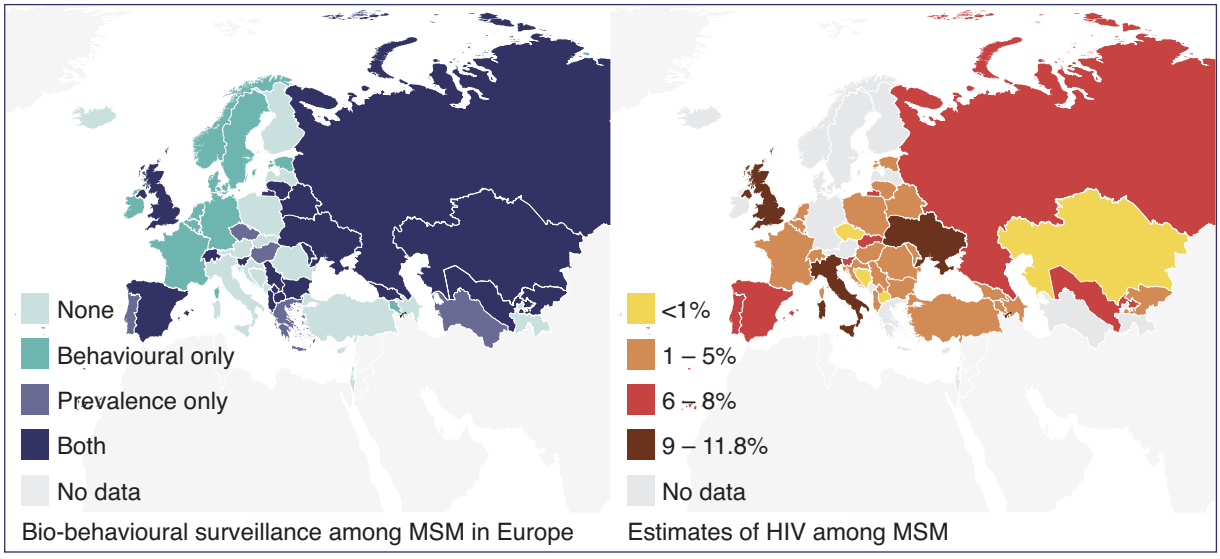
Figure 4.3 Monitoring HIV prevalence and risk among FSWs and extent of the epidemic



Source: Appendix 2.A.8.

In four countries of high prevalence (>5%) among MSM, there was no evidence of repeated targeted studies to monitor prevalence or risk behaviours (Slovakia, Poland, Luxemburg, and Italy) (Figure 4.4). In the one country (Israel) without a prevalence estimate but with an annual average of 10 or more HIV diagnosis among MSM per million people between 2006 and 2010, there was also no evidence of monitoring. Of the 23 countries with moderate HIV prevalence among MSM (between >1% and <5%), there were seven with no monitoring of either prevalence or risk behaviours (Latvia, Azerbaijan, Turkey, Romania, Croatia, Cyprus, Malta, and Finland). There is a need, therefore, to implement studies to directly monitor HIV risk among MSM in 12 countries, as well as expand monitoring activities to include measures of prevalence in others.

Figure 4.4 Monitoring HIV prevalence and risk among MSM and the extent of the epidemic



Source: Appendix 2.A.10.

Evidence thus shows that activities to directly monitor HIV prevalence or risk are well established in Europe among PWID, but less so among SWs and MSM. It is important that macroeconomic transitions, including spending cuts in the area of public health, do not deter nations from resourcing targeted studies to directly monitor HIV among key populations, especially in countries with HIV prevalence in populations at risk above 1%.

4.1.4 Strategies for strengthening surveillance studies

There is likely scope to strengthen the methods of targeted surveys used to directly measure HIV prevalence and risk in populations at risk. Key indicators of quality in the methods of targeted population surveys of prevalence and risk include the ability to: (i) recruit broadly reflective samples of the populations; (ii) measure biological outcomes; (iii) collect reliable behavioural data; and (iv) have sufficient sample sizes. For surveillance studies which may need to be sustained over years, if not decades, a pragmatic balance between robustness and cost will be needed. Ideally, surveillance systems: (i) use a standardised definition of the population (if not across different geographical locations at least over time); (ii) collect repeated data from the same or comparable location(s) in order to monitor trends; (iii) generate data on risk exposure and practices, including structural risk factors; and (iv) collect biological indicators in relation to HIV, HCV and STIs while using a consistent or comparable methodologies over time. [9 – 16]

Sampling vulnerable and key populations

Of critical importance is consistently using an appropriate sampling methodology to obtain a sufficiently large sample. [17 – 18] Community-based methods, such as the use of respondent driven sampling [19 – 22] in combination with methods to assess recruitment network effects, [20, 23] as well as time location sampling [24 – 25] and chain referral sampling, [26 – 28] are well suited to researching key populations. Our review gave particular emphasis to studies of prevalence and risk that adopted community-based and multi-location sampling methods which seek to avoid potential biases linked to recruiting key populations in clinical settings. However, these sampling methods can be relatively complex and potentially costly, and thus are often not well suited as routine tools of public health monitoring. [29] It is also important to note that these sampling methods are subject to their own biases (and may over recruit particular sub-populations or networks). While potentially less robust methodologically, pragmatic and cost-efficient sampling approaches suitable for surveillance studies typically involve recruitment through existing structures, such as, low threshold services, known venues and congregational sites, outreach, and internet sites. However, sampling only through clinical and treatment settings (such as STI clinics and OST) should be avoided.

Centralising data collation

At present there is no centralised portal for the collation and synthesis of HIV prevalence data at the European level, a former responsibility of EuroHIV. [30] The development and maintenance of monitoring activities at a national level could be aided by the European wide central collation of core data on HIV prevalence and risk behaviours. The extent of surveillance among PWID in EU countries, especially in medium prevalence settings, is likely an indirect consequence of the central collation system operated for HIV prevalence among PWID by the EMCDDA. [31] Data on directly measured HIV prevalence among key populations of PWID, SW and MSM should be collated centrally. Consideration should also be given to collecting risk behaviours data centrally, as well as data from other populations at risk, including migrants.

Measuring HIV incidence

Consideration should be given to estimating HIV incidence in key populations at high risk. Cohort studies are costly and complex yet incidence can be assessed in other ways, including via laboratory testing algorithms and data from serial cross-sectional surveys. Laboratory testing algorithms, such as the Serological Testing Algorithm for Recent HIV Sero-conversion (STAHRS), may be of particularly fruitful. [32 – 34] Using STARHS to assess HIV incidence in prevalence studies of hidden populations of PWID and MSM has proved particularly useful. [35] STARHs should be considered among PWID and MSM alongside the collection of data on past HIV testing and uptake of ART in countries with high prevalence (<5%) in these populations.

Estimating population size

In addition to surveys to directly measure HIV prevalence and risk, a key element of an effective public health surveillance programme is the capacity to quantify the size of populations at risk. Most countries have published estimates of the size of populations of PWID and SWs, although these may not be recent, and few countries have published estimates of the size of MSM populations. Without an estimate of the denominator, or the population group at risk, it is difficult to measure whether HIV prevalence at a general population level is increasing or whether it is the size of the population group that is changing. Estimating the size of a population at risk not only assists in the allocation of intervention resources but is essential for estimating the coverage, and thereby impact, of interventions. [36 – 38] As we note further below, intervention coverage, in combination with epidemic situation and behaviour change, is a critical determinant of HIV prevention. [39 – 40] There is now established guidance, as well as evidence, on the methods best used to assess the size of a hidden populations at risk. [41 – 43]

The social context of surveillance

A key challenge in collecting data to inform interventions is the political context in which sex work, drug use and sex between men takes place. In contexts where, for example, sex work is heavily regulated or sex between men is stigmatised, conducting surveillance among people with few rights or representation may create ethical and safety concerns for the populations involved. Proposals for surveillance need to be conducted with full consultation with the populations in question and their advocates, so as to build in appropriate protections to surveillance systems. [8]

4.2 HIV prevention responses among people who inject drugs

To complement our systematic review of epidemiological data presented in Chapter 3, we draw here upon a variety of data sources, including recently published systematic reviews [1 – 5] and HIV prevention data collated by the EMCDDA, [6] to synthesise key estimates of intervention 'coverage' as well as describe how policy environments mediate the delivery of HIV prevention for PWID. We emphasise the potential enhanced impact of HIV prevention interventions which operate in combination and of interventions targeting policy and environmental change.

4.2.1 Combination HIV prevention for PWID

HIV prevention targeting PWID is increasingly envisaged as a product of 'combination intervention', with an intervention strategy comprising a package of interventions tailored to local setting and need.[2, 5, 7 – 9] This combination of interventions may draw upon those identified by the WHO and other international agencies as core to evidence-based HIV prevention targeting PWID, including: needle and syringe distribution programmes (NSPs); opioid substitution treatment (OST); antiretroviral HIV treatment (ART); the provision of drug consumption rooms (DCRs); peer education and outreach; HIV testing and counselling services; and the promotion of public policies and other structural changes conducive to protecting the health of populations at risk. [10] We will concentrate here on the three cornerstone HIV prevention interventions of NSPs, OST and ART, but also emphasise the importance of increasing uptake of HIV testing in order to identify those in need of ARV. The two most recent systematic reviews of evidence of the effectiveness of HIV prevention targeting PWID are those by Degenhardt et al (2010) and Kimber et al (2010).

Box 2. Four core HIV prevention interventions

NSPs provide sterile needles/syringes and other injecting equipment to PWID, via fixed-sites, outreach, peer PWID networks, vending machines, and pharmacies. By maximising the number of clean injecting equipment in circulation, we minimise the time infected equipment remain in use and the proportion of unsafe injections. [11]

OST is prescribed to dependent users to diminish the use and effects of illicitly acquired opiates. It is usually taken orally and therefore reduces the frequency of injection and unsafe injecting practices. [12]

ART is prescribed to HIV positive PWID to reduce viral load and consequently can reduce HIV transmission. [13, 14]

HIV testing is expanded to enable timely start of treatment.

With regards to NSP, reviews conclude that there is strong evidence linking NSPs to reduced levels of HIV risk among PWID, as well as evidence to link

NSPs with the reduction of HIV incidence among PWID. [12, 15 – 17] Intervention coverage appears pivotal, with the intervention effect likely proportional to the volume of needles and syringes distributed and in circulation and the proportion of PWID clean equipment sufficient to inject without unclean equipment. [2, 18] There is also a large body of evidence showing the effectiveness of OST in HIV prevention. [2, 4] Sufficiently high doses in combination with sufficient retention in treatment are linked to reductions in both drug use and HIV risk, [19 – 21] including a reduction in HIV incidence. [4, 22 – 28] Given the evidence of effectiveness of both methadone and buprenorphine, [20, 29] the WHO lists these as essential medicines for the treatment of opioid dependence worldwide. Despite this evidence some resistance remains to the provision of OST to PWID in the region, notably in the Russian Federation, reasons for this are examined in Case Study 4.2. In addition, regarding the HIV prevention impact of ART, evidence suggests that lowering viral load prevents HIV transmission in serodiscordant partners, thereby reducing HIV incidence. [30, 31] Among PWID, a prospective cohort study found that the concentration in plasma of HIV-1 RNA predicted community-level HIV incidence, including after adjustment for injecting and sexual risk behaviour. [32] This decline occurred as the coverage of ART among PWID increased from 43% to 70% and as the proportions treated with ART increased from 8% to 99%.

Case Study 4.2 The HIV prevention impact of introducing OST in the Russian Federation

One of the strongest voices of policy resistance to OST emanates from the Russian Federation. The use of methadone and buprenorphine in treating opioid dependence is legally prohibited. Resistance stems from efforts to preserve existing drug treatment systems alongside concerns to prevent the diversion of new medicines (such as methadone or buprenorphine) to the illicit market or safely monitor their use. More fundamentally, resistance to substitution treatments is grounded in the history and teaching of 'narcology', a subdivision of Soviet criminal psychiatry, which conceives of treatment from addiction in abstinence terms. Narcologists have opposed the use of methadone in opioid treatment as a "vicious practice", as a "toxic" substance creating severe *addiction,* as one step removed from 'legalising' drug use, as a failing intervention of the West, and most significantly, as a failure to deal with the criminality of drug users. [33 – 35]

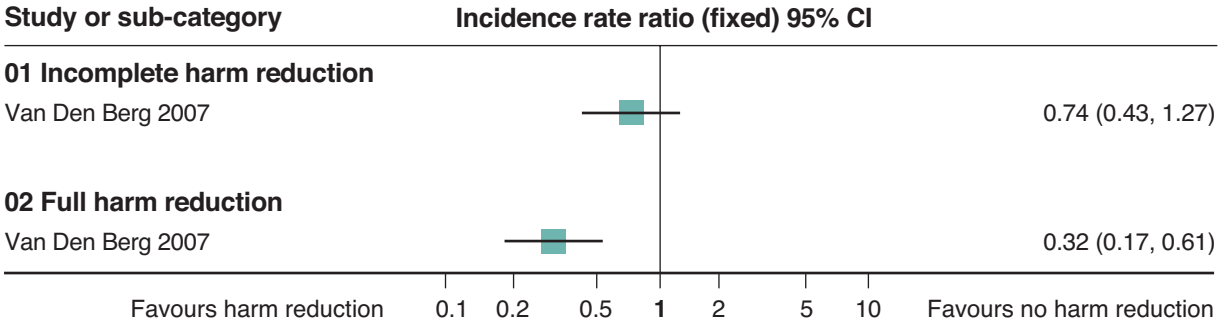
Combination intervention effects

Evidence points towards the enhanced impact of HIV prevention interventions when they are delivered in combination. [2, 7] Cohort and modelling studies have shown that the impact of NSP and OST on reduced incidence of infectious disease among PWID can be modest if delivered as 'stand-alone' interventions but are markedly more effective when delivered in combination, with sufficient engagement among participants to do both. [2, 7] This may be especially the case in reducing the incidence of HCV among PWID. [15] To date, there is only one European study showing that 'full participation' across combined interventions (NSP and OST) can reduce HIV incidence (by 57%) and HCV incidence (by 64%). [7] Based in Amsterdam, this cohort study recruited PWID from 1985, and as shown by Figure 4.5 found that HIV incidence among PWID was independently associated with accessing a higher level of HIV prevention and harm reducing interventions. Multivariate analyses found that after adjustment, clients participating 'fully' in available services (daily full dose of methadone and either no injecting or always using NSPs) were at 57% (95% CI 13% – 79%) less risk of HIV than participants not accessing such services, whilst those participating in a 'limited' fashion (either full NSP and less regular methadone, or full methadone and less regular NSP) were at 13% reduced risk (95% CI 52% greater risk to 50% less risk) of HIV than participants not accessing these services. [36] Similar findings have emerged from a study in four Central Asian countries conducted over 18 months. [37]

Just as the effectiveness of NSP and OST services may be enhanced when combined, there is an enhanced impact relationship between participation in OST and adherence to ART among PWID. [38 – 40] Similarly, low threshold access to HIV testing is an important combinative component of HIV prevention. In the West of Europe, there is a considerable level of homogeneity in policy priorities regarding measures to limit the spread of infectious diseases among drug users, with NSP being offered either in combination with voluntary testing and counselling for infectious disease, or in combination with the dissemination of information, education and communication materials. [41] Additionally, the integration of ART with TB treatment and prevention is a critical feature determining health outcomes in people living with HIV, [42] especially so in the East where TB drug resistance among PWID is most frequently reported. [43]

While documented examples are sparse, descriptive evidence suggests that fully integrating services facilitates retention in treatment. For instance, a programme combining OST, ART, testing for TB, HIV, viral load, and CD4, with counselling and psychosocial support in Dnipropetrovsk, Ukraine, reported an overall retention rate of 70% (n=428) among PWID. [44] Below we explore further the effect of different interventions on HIV incidence and prevalence in settings with HIV prevalence of HIV among PWID.

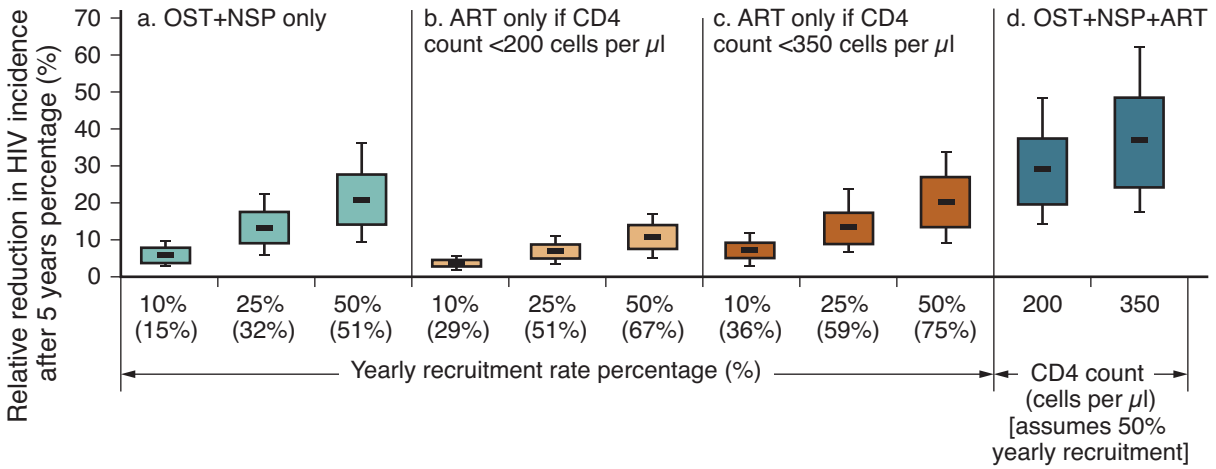
Figure 4.5 Effect of full and partial combined interventions on HIV incidence



Source: Van Den Berg et al, 2008. [7]

Drawing upon the exemplar of the Amsterdam cohort noted above, [7] recent mathematical modelling studies have sought to project the effects of escalating coverage of NSP, OST and ART interventions delivered in combination to PWID. [2] Figure 4.6 reproduces these findings, showing the effect of different intervention combinations and yearly recruitment rates on HIV incidence among PWID after five years. Figure 4.6 shows that single interventions may have limited effect whereas interventions in combination have greater effect, and that medium to high intervention coverage is required to have a substantial effect on HIV incidence. In addition, the HIV prevention impacts of ART are marked (37%), especially when delivered to all HIV positive PWID with CD4 counts lower than 350 cells.

Figure 4.6 Effect of HIV prevention interventions in combination



Source: Degenhardt et al, 2010. [2]
Note: ART = anti-retroviral therapy; NSP = needle syringe programme; OST = opioid substitution therapy.

4.2.2 Coverage of HIV prevention interventions among PWID

Coverage has been defined as the proportion of the population at risk reached by an intervention, ideally with sufficient intensity to have probable impact and is a critical determinant of assessing HIV prevention effectiveness. [2, 18, 45, 46] Data summarising the coverage of HIV prevention interventions was drawn primarily from published reviews emanating from the Reference Group to the UN on HIV and Injecting Drug Use which draws on data from a variety of sources including UNGASS, WHO, and systematic reviews of scientific literature [1] and country level data collected by the EMCDDA that draws on data from routine reports from European governments. [47]

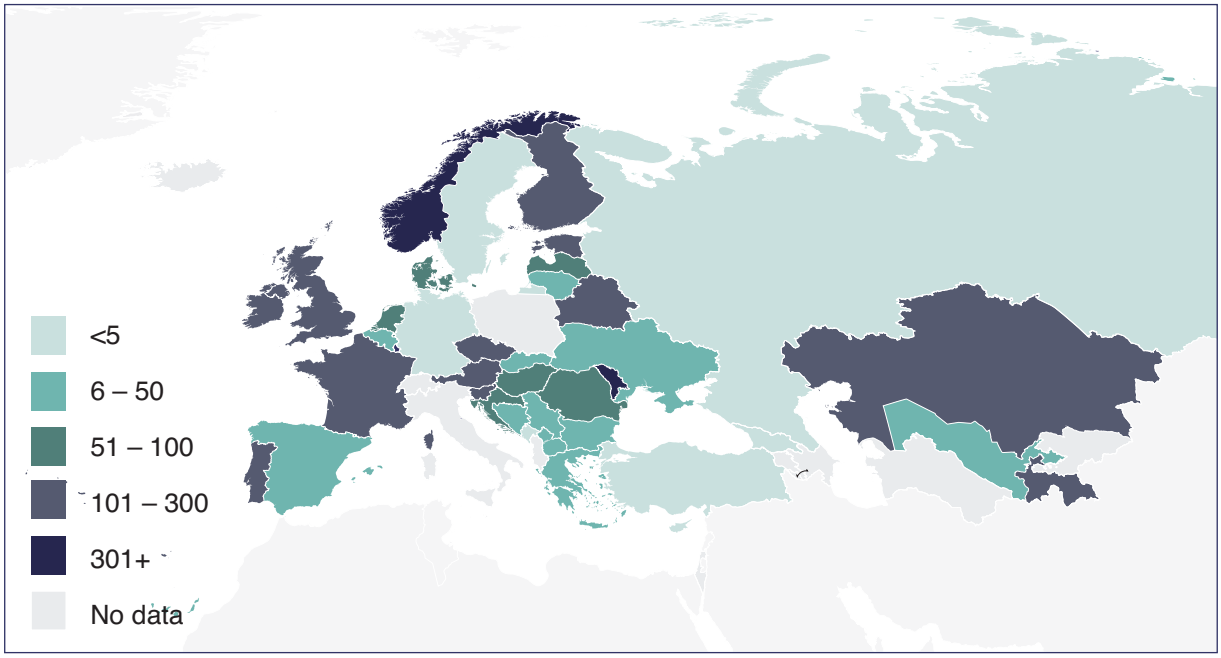
Needle and syringe exchange programmes

The systematic review showed [1] that 53 of the 54[5] WHO European Region defined countries reported evidence of injecting drug use, and all but five have NSPs. Of the five countries not providing NSPs (Andorra, Iceland, Monaco, San Marino and Turkey), only Turkey has a total population of over 500,000.

There is wide variability in the estimated coverage of NSPs and coverage itself can be measured in a variety of ways. [46] The review defined 'coverage' to be the number of needles distributed per PWID per year. The data do not include purchases from pharmacies (see below) which may constitute a significant proportion of the equipment in circulation, especially in the East. The operating rules of NSPs can differ, some offering unlimited needle/syringe distribution, others offering exchange only. Some NSPs limit the number of needle/syringes that can be exchanged to only a few at a time, increasing the number of contacts person has with a service and compelling them to hold on to used needles for longer periods of time than they otherwise might. This may increase the likelihood of reusing the needles as well as increase the likelihood of police harassment in some countries. [48 – 50] It also does not account for possible secondary distribution and may underestimate the number of PWID benefiting from the NSPs. Finally, the number of syringes a PWID needs to make every injection with a sterile needle will depend on their personal drug use, which may include duration of injecting, types of drugs injected as well as whether or not they use OST. Given these limitations, comparisons between the coverage data presented here should be interpreted cautiously.

In Finland in 2009, over 13,000 PWID (about 85% of the total), received over three million syringes, an average of around 230 each. [6] In the Russian Federation in 2008, only 7% of PWID (less than 130,000 individuals) accessed NSPs with these each receiving an average of only 56 needles. [1] Coverage estimates vary widely even within European sub-regions. In Eastern Europe, for example, the percentage of PWID accessing NSPs is estimated between 1% (range from 0.6% to 11%) in Georgia in 2008 to 68% (range from 52% to 97%) in Lithuania in 2007. [1] In Western Europe access ranges from 4% (range from 2% to 6%) in France in 2007 to the much higher rate of 81% in Finland in 2007. There are less data for Central Europe but 15% of PWID in Slovakia accessed NSPs in 2008 and 50% in Hungary in 2007. The estimated number of syringes distributed per estimated PWID in 2009 or the latest year for which data are available, range from under 5 syringes for example in the Russian Federation (a very high prevalence country, see section 3) to over 300 in Norway and over 500 in the Republic of Moldova.

Figure 4.7 Number of needles distributed per PWID in 2009 or most recent year



Sources: EMCDDA Statistical Bulletin 2011; Mathers et al, 2010. [1, 6, 51]

5 This is because Lichtenstein data are reported via Switzerland.

Social-structural factors may play a large role in why so few needles and syringes are accessed by PWID in some parts of the region. Reports from Ukraine of unjustified police harassment outside NSPs and narcology clinics where OST is administered may deter many PWID from visiting or returning to obtain clean needles or treatment. Stories of detention, compulsory drug testing and subjection to humiliating procedures are common place in cities such as Sumy and Ternopil. [52] A mixed-methods study from 3 cities in the Russian Federation involving over 200 interviews and 1,500 questionnaires with PWID reported 93% of injectors accessing clean syringes from pharmacies and only 7% ever having been in contact with city NSPs.[48, 53] Pharmacies were described as being extremely easy to access, unlike syringes that could be situated far away, travel costs outweighing the benefit of free equipment and increasing the likelihood of police interference. One-for-one exchange policies at NSPs were also seen as unreasonable as storing and transporting used syringes was described as risky in terms of being discovered by a relation or the police as a drug user. NSPs were seen as useful for receiving additional benefits such as health care and an understanding environment. [48, 54]

Given the mixed coverage of NSPs in the region, pharmacies provide a significant point of access for sterile syringes in many parts of Europe. Accounts from the East often describe pharmacies as the preferred method of obtaining sterile injecting equipment and may be the primary source of sterile needles: in a survey of three Russian cities involving nearly 1,500 PWID, 93% of respondents used pharmacies as their main source of clean injecting equipment. [48] In Northern Ireland in the United Kingdom, free syringes are only available through pharmacies. [55] In Sweden, however, pharmacy sales are legally restricted, and needles are only available through two hospital-based outlets, denying PWID clean equipment from this source. [45, 55]

Although both NSPs and pharmacy sales may operate, in some settings the possession of a syringe, especially a used one, may constitute evidence of drug use and/or lead to harassment or arrest. [48, 50] In Ukraine, for example, the threshold for the offence of legal possession of drugs in 2010 was reduced to 0.005g of the most commonly injected drug, hanka, with such possession potentially leading to a jail term of three years. While this threshold has been increased in recent years, these possessions laws worked against the widespread carriage and distribution of injecting equipment to PWID, also compromising the work of NSP staff. [56]

Opioid substitution therapy

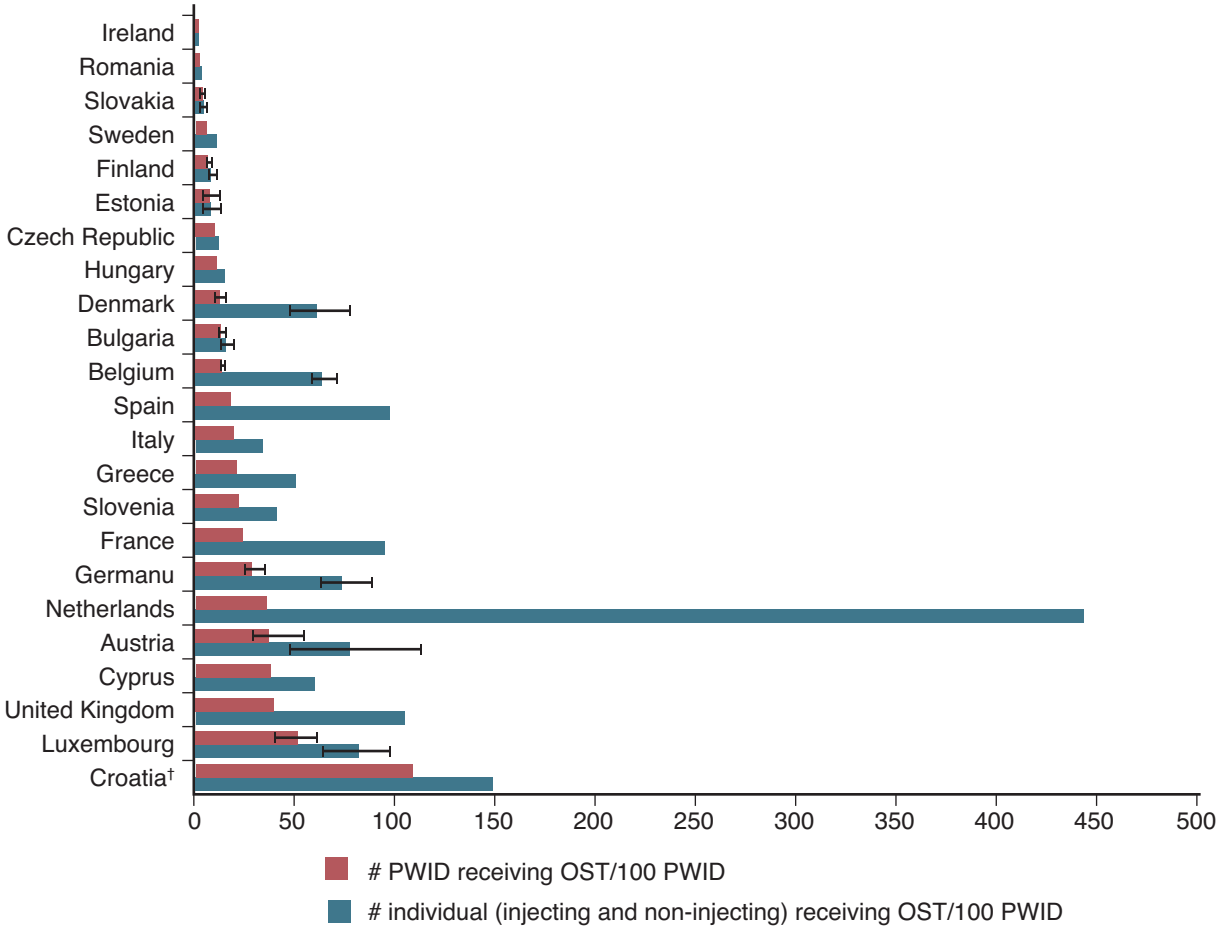
In Europe, OST comprises methadone or buprenorphine based treatments, and in fewer cases, heroin assisted treatment, and sometimes morphine. In a systematic review of coverage, [1] six of the 53 countries reporting evidence of injecting drug use did not provide OST (including the Russian Federation, Uzbekistan, Turkmenistan and Turkey).

As with NSPs, the coverage of OST varies greatly throughout the region (Figure 4.8). It is more complicated to compare the uptake of OST across the countries since OST is available to both injectors and those who use opiates through other modes of administration so the denominator is often not standardised across the countries. In Spain or the Netherlands for example less than 10% of opiate users inject. [6] A country with low injecting rates among opiate users would have an over estimated rate of OST per 100 PWID, compared with countries whether the majority of opiate users inject. In some central European countries including the Czech Republic, Slovakia, and increasingly Hungary, many injectors report amphetamines and methamphetamines as their primary drug, for which no substitution treatment exists. As a result, these countries will have a low rate of OST per 100 PWID compared with countries where opiates are more common.

The highest reported absolute number of individuals receiving OST are in the United Kingdom, France and Italy where over 100,000 individuals received OST in 2009 or the last year recorded. [6] Of the countries with reported data and excluding Russian Federation and Uzbekistan where OST is unavailable, the smallest reported absolute numbers of individuals receiving OST are in Ireland, Tajikistan and Montenegro where less than 50 individuals received OST in the last year recorded. Accounting for the number of PWIDs and estimated rates of injecting among opiate users (assuming equal access to OST

by injectors and non-injectors), Luxembourg had the highest plausible number of PWID receiving OST (51/100 PWID), followed by the United Kingdom and Cyprus (41 each). Without knowing exactly how many opioid dependent injectors exist and are receiving OST in Europe it is difficult to draw conclusions, however, it is clear that generally OST coverage was low, and very low outside of the West, with no country in the two sub-regions reporting more than 30 opiate users receiving OST per 100 PWID, and likely much fewer injectors receiving OST. It is not clear why coverage appears low, although limited treatment places as well as geographic location of the service may play a part or, as in the case of Kazakhstan, implementation of OST has been limited to pilot projects in need of scale up. [57]

Figure 4.8 OST coverage in Europe for 2009 or the most recent year



Source: Black bars show the range of estimates available. [1, 6]
Notes: † = Croatia estimate of PWID receiving OST/100 PWID is implausible, however included for completeness.; OST = opioid substitution therapy: PWID = people who inject drugs.

Anti-retroviral treatment for HIV disease

As with NSPs and OST, the global availability of ART for HIV positive PWID was described recently by Mathers et al, although there is generally less data available than for the other treatment services. Throughout the whole region (where data exist) less than 100 PWID receive ART per 100 PWID living with HIV. However, data on ART access for other risk groups or the general population is not provided so we cannot draw conclusions about access for PWID compared with other groups. However, a WHO report on PWID access to ART across the region [58] describes how in 2002 46% of HIV cases in the region were among PWID and yet only 10% of those receiving ART were PWID. By 2008 this inequality had decreased, with 42% of infections among PWID and PWID making up 31% of ART recipients. This however, does not include data from the Russian Federation which undermines the comparability due to the magnitude of PWID and HIV among PWID there. [58] Data from 2008 indicate that while PWID make up 83% of HIV cases in the Russian Federation and 60.5% in Ukraine, they only constitute between 20 – 30% and 24% of ART recipients respectively. [3]

In Western Europe the number ranges from 10 (range six to 22) PWID receiving ART per 100 HIV positive PWID in Portugal to 70 in Luxembourg, although in absolute numbers this means only 39 PWID accessing ART. Spain has the most PWID accessing ART at nearly 40,000, although this may account for a smaller proportion due to a much larger HIV+ PWID population. In Eastern Europe and the former Soviet Union the rates vary from less than 1% (range <1% to 33%) in the Russian Federation up to 18% (range 8% to 48%) in Armenia. There are little data for Central Europe, but the Czech Republic reports 81 PWID receiving ART for every 100 HIV positive PWID, although this is based on very small numbers of HIV positive PWID.

The view that PWID are less likely to adhere to ART unless they have either stopped injecting or are receiving full OST services is increasingly challenged. A study from Amsterdam, for instance, found that current injecting drug users on ART to the same extent as drug users accessing OST and NSPs regularly and those who were no longer injecting or reliant on harm reduction programmes. [59]

Combination HIV prevention for people who inject drugs

Despite emerging evidence, especially from mathematical modelling studies, [2] of the potential impact of developing HIV prevention interventions in combination for PWID, data on the coverage of combination interventions is not routinely or systematically collected in the region.

Modelling combination HIV prevention impact

We have noted above that there is evidence of the effectiveness of NSP, OST and ART in reducing HIV risk and prevalence, yet in most Central and Eastern sub-regions coverage remains low, especially when these interventions are considered in combination. OST is unavailable in the Russian Federation and programmes in Estonia and Ukraine are believed to reach only around 7% and 2% of PWID respectively. [60] ART coverage is disproportionately low among PWID in Europe in general compared with the general population, [58] and is particularly low in these high prevalence settings where the proportion of HIV positive PWID receiving ART is estimated to be much less than 10%. [60]

Here, we draw upon a mathematical modelling analysis to consider the potential impact on HIV incidence and prevalence of OST, NSP and ART in three illustrative epidemic scenarios in Europe: the Russian Federation, Estonia and Tajikistan. Two of the scenarios are based on the high HIV prevalence (>40%) settings of St. Petersburg (Russian Federation) and Tallinn (Estonia), whereas the third is based on a lower HIV prevalence (<20%) setting of Dushanbe (Tajikstan). All three settings currently have very low coverage of OST and ART among PWID at less than 10%. NSP coverage is high in Tallinn (~70 syringes per PWID per year [61]), moderate in Dushanbe (10 – 20 syringes per PWID per year [62]) and low in St. Petersburg (personal communication Robert Heimer).

Figure 4.9 below shows the required coverage of different intervention combinations for achieving a 30 or 50% relative decrease in HIV incidence or prevalence compared to baseline over 10 years. Different combinations are considered for each setting because Tallinn already has high baseline coverage NSP, which is taken as the comparator for that setting, while Dushanbe has moderate coverage NSP.

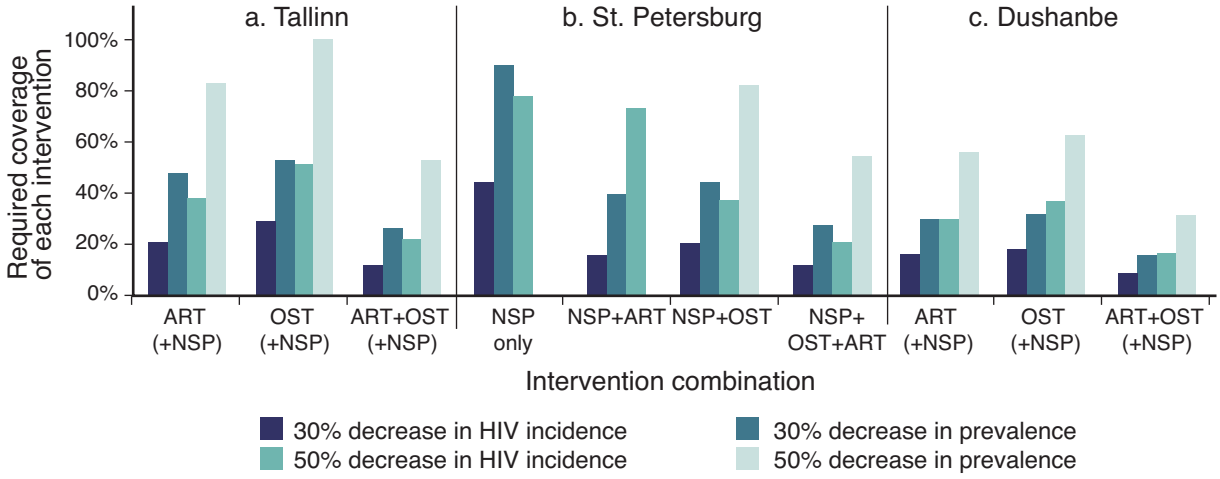
For St. Petersburg, the projections highlight that high coverage levels of NSP on its own (79% coverage for a 50% reduction in HIV incidence over 10 years) are required to achieve a 30/50% decrease in incidence over 10 years—similar to the high NSP coverage already achieved in Tallinn. However, if NSP is combined with ART or OST in St. Petersburg then the required coverage level for each intervention reduces by half to two thirds of what it was for just NSP. When all three interventions are combined, the required coverage levels reduce by a further 25 – 50%, with only 12% coverage of each intervention being required to achieve a 30% reduction in HIV incidence over 10 years in St. Petersburg.

Similar findings are obtained for Tallinn and Dushanbe except that the coverage required for a single additional intervention (OST or ART on top of the existing NSP) to reduce incidence by 30 or 50% are about half of the levels required in St. Petersburg. This can be explained by the lower baseline HIV

incidence in Tallinn and Dushanbe in 2012 due both to the pre-existing moderate or high coverage NSP interventions and the lower overall risk in Dushanbe.

In order to achieve the same reductions in HIV prevalence over 10 years in any of the three settings, about double the coverage level is required (relative to what was required to achieve the same reduction in HIV incidence in that setting) with the required increase in coverage being more pronounced if ART is involved due to ART extending survival and so resulting in HIV infected PWIDs remaining in the population for longer.

Figure 4.9 Coverage to decrease HIV incidence or prevalence by 30 or 50% in 10 years



Source: Modelling analysis.
Notes: Tallinn and Dushanbe baselines include high or moderate NSP; ART = anti-retroviral therapy; NSP = needle syringe programme; OST = opioid substitution therapy.

Figure 4.10 considers the required coverage of each intervention combination to either reduce HIV incidence to less than 1% or HIV prevalence to less than 10% over 20 years. The projections for single interventions are not shown because they were unable to achieve these impact targets, except for Dushanbe where coverage levels of about 85% and 65% of any single intervention reduced HIV incidence to <1% or prevalence to <10% after 20 years, respectively. For any pair of interventions, projections suggest that very high coverage levels of above 80% are generally required to achieve these targets for the higher prevalence settings of Tallinn and St. Petersburg, whereas much lower coverage levels (30 – 50%) are needed in Dushanbe. Lastly, if all three interventions are combined, these coverage requirements reduce by a quarter in all settings, to 55 – 62% coverage of each intervention being required in Tallinn and St. Petersburg and 23 – 30% in Dushanbe.

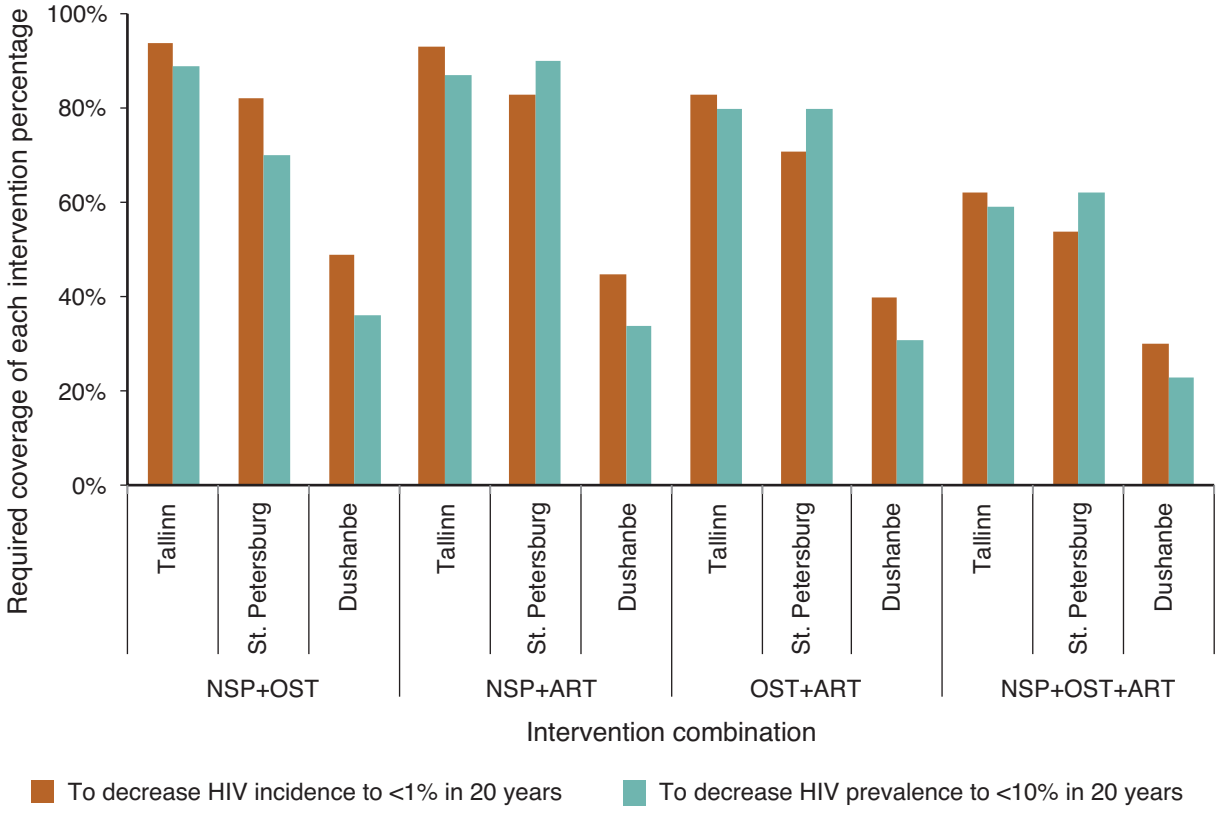
These projections suggest that high but achievable coverage levels of NSP can result in large decreases (>30%) in HIV incidence and prevalence in settings with high HIV prevalence among PWID. Required coverage levels are much lower when interventions are combined or in lower prevalence settings. The analysis also highlights the importance of combination interventions for reducing HIV incidence and prevalence to low levels in high prevalence settings, with no single intervention (or only at high coverage in the lower prevalence setting of Dushanbe) being able to reduce HIV incidence to less than 1% or prevalence to less than 10% in 20 years. However, in combination these targets become more feasible, although still considerable, with about 60% coverage of all three interventions being required to achieve these targets in Tallinn and St. Petersburg over 20 years, and about 30% coverage in Dushanbe.

HIV testing services

In Western Europe a high proportion, generally over 90%, of PWID participating in studies reported having previously been tested for HIV. An exception to this was in 2005 in Italy where only 61% reported previously having an HIV test. [63] In the East, levels varied widely, from 11% and 95% of PWID ever

having previously been tested for HIV. In the previous 12 months, the estimated proportion of PWID who had been tested and who knew the result varied from as low as 5% in Baku and Lenkoran in Azerbaijan [64] up to as high as 72% in Vilnius, Lithuania, [65] although more typically the figure varied from around 23% to 57%. [65] Elsewhere in the region HIV testing among this population was generally lower. In Central Europe studies from Romania and Serbia showed between 19% – 22% of PWID having been tested for HIV in the last 12 months and knew the result. [66, 67] In The former Yugoslav Republic of Macedonia , Bulgaria and Bosnia/Herzegovina the proportion grew to between 36% and 48%. [68 – 70] In Albania in Tirana only about one third of PWID surveyed in 2005 and 2008 reported ever having had a test. [71, 72] The highest reported proportions in the sub-region were in Croatia where 83% of PWID reported ever having had a test. [73] Studies from Central Asia varied from the low rates of 13% – 15% of PWID having ever been tested for HIV in Tajikistan and Uzbekistan up to higher (although still modest) levels of 40% – 56% in Kazakhstan and Kyrgyzstan. [74, 75]

Figure 4.10 Coverage to decrease HIV incidence or prevalence to < 1% or 10% in 20 years



Source: Modelling analysis.
Notes: ART = anti-retroviral therapy; NSP = needle syringe programme; OST = opioid substitution therapy.

High testing rates in the East generally may be due to mandatory testing of migrants and opt-out testing polices rather than opt-in at a variety of locations including narcology centres, TB centres, prisons, ante-natal clinics and pre-surgery. [76, 77] Evidence shows that a history of HIV testing has been associated with reduced risk of HIV prevalence in some cities in the Russian Federation, [78] although such high levels of HIV testing are at odds with low levels of OST, NSP and ART availability for PWID.

A note on age and other restrictions regarding service access

Despite data from the East of the region indicating that initiation to injecting can happen well before the age of 18, [79] young people (aged under 20) are often less able to access the above cornerstone HIV prevention services than their older counterparts. Qualitative data from Ukraine, for example, describes multiple barriers keeping vulnerable youth from harm reduction services including: the need for parental consent; identity papers; distrust of authorities; fear of registration; deportation to the police; forced

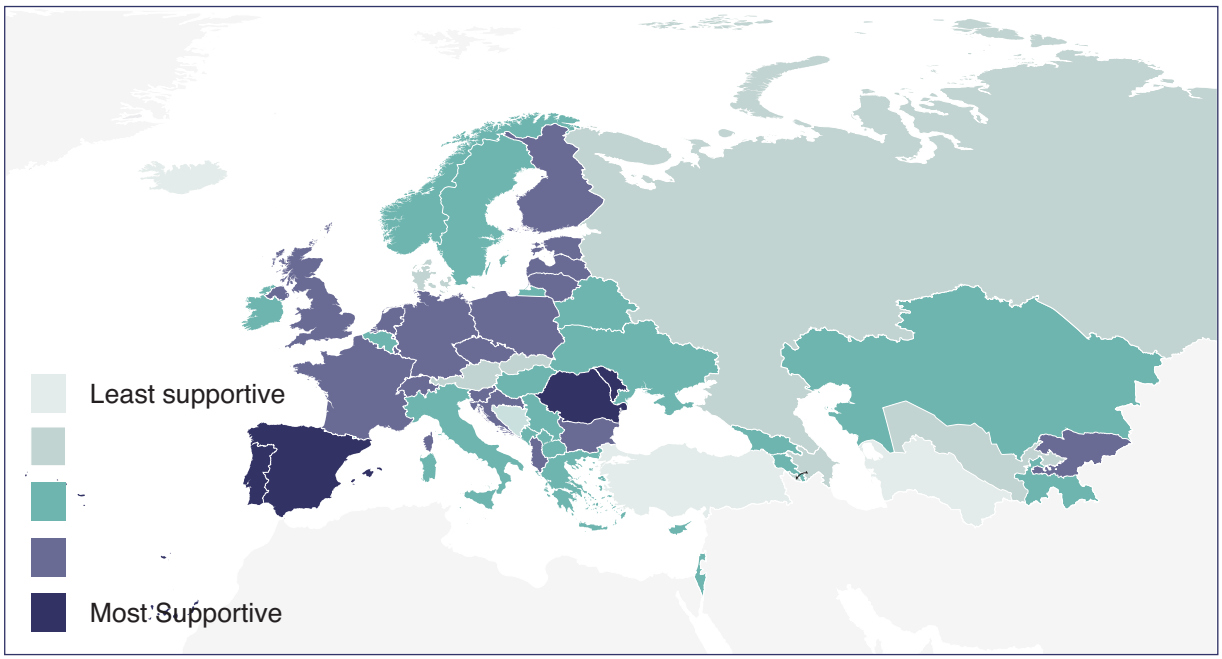
detoxification; institutionalization into state child care facilities; inaccessibility of services and discriminatory attitudes by health providers. [80] Programmes are missing a window of opportunity to prevent vulnerable young people from transitioning to injecting or from learning risk reduction strategies that may help them avoid injecting related harms.

In addition, among some countries in the East – including the Russian Federation, Georgia and Ukraine – access to drug treatment requires prior registration as an addict. [81] Such registration can last for up to five years and can also result in loss of various rights as well as reduce access to employment opportunity, increase felt stigma, and leave individuals more vulnerable to police intervention. Concerns about registration are often cited as a significant barrier to accessing harm reduction services. [48, 53]

4.2.3 Policy environments mediating HIV prevention among PWID

The policy environment, in combination with other social and structural factors, mediates the development and impact of HIV prevention targeting PWID. [82 – 84] Our reviews of evidence have noted the potential role of policing practices, law enforcement policies, social-material factors, gender, and social stigma as social forces shaping risk and prevention responses. Recognising HIV epidemics as features of their social contexts emphasises the potentially pivotal role of interventions in creating environments which are enabling, rather than constraining, of evidence-based HIV prevention. [82 – 84] As noted in Chapter 1 (Methods) a crude index of enabling policy environment for HIV prevention among PWID may include, but is not restricted to, the following domains: (i) the meaningful engagement of key stakeholders (including PWID) in policy formation and programming; (ii) a coordinated multi-sectoral national HIV prevention strategy emphasising an evidence-based public health and rights-oriented approach; (iii) the generation of research and surveillance on HIV epidemic spread and response; and (iv) the development and scale-up of a package of evidence-based interventions, including the removal of structural obstacles limiting their implementation. [2, 85] Accordingly, there have been increasing calls to de-emphasise the criminalisation of PWID by developing public policies emphasising public health above law enforcement dominated approaches and for the rapid scaling-up of HIV prevention alongside community action and social support interventions. [2, 85 – 88]

Figure 4.11 Policy environments for HIV among PWID in Europe



Sources: INPUD; HRI; EMCDDA; Mathers et al 2010; systematic review.

The findings generated by our simple index of enabling policy environment (see Chapter 1, Methods) are shown in Figure 4.11. Of the 50 countries to which we applied the index, 14 have national organisations of drug users. Forty four explicitly and supportively mentioned harm reduction in their national strate-

gies. Thirty seven countries have carried out at least one HIV prevalence and one behavioural study among PWID in the last 10 years. OST and NSP are available in 46 countries (OST is unavailable in the Russian Federation, Turkey, Turkmenistan or Uzbekistan and NSP is unavailable in Turkey) as well as in prison in eight countries. Ten countries use administrative rather than criminal penalties for people found possessing small quantities of drugs for personal use.

The index suggests the country with the most supportive policy environment is Spain followed by the Republic of Moldova, Portugal and Romania. Spain reported positively against each of the five indicators we used for the index. Spain and the Republic of Moldova are among the five countries worst–affected by HIV in Europe. The HIV prevalence among PWID in these countries is extremely high at over 20%. The other countries with comparable prevalence are Estonia, Russian Federation and Ukraine which appear to have middling levels of supportive policy environments.

The country with the seemingly least supportive environment is Turkmenistan followed by Iceland and Turkey. Turkmenistan does not exhibit any of the characteristics of a supportive environment, however Turkey has undertaken a biological prevalence and a behavioural study recently and OST and NSP are available in Iceland, outside of prison settings. Among the other low scoring countries, both the Russian Federation and Turkey reported having undertaken prevalence and behavioural monitoring among PWID in the past 10 years and in Iceland OST is available to PWID.

We do not suggest that countries characterised as being more supportive by the index have optimal policy environments for HIV prevention among PWID, and acknowledge the limits of this crude index of policy environment. Another key factor indicating a governments commitment to HIV prevention is the amount spent, this is illustrated below in Case Study 4.3. Some countries (Spain, Republic of Moldova) score highly on the policy index but have high HIV prevalence among PWID. This may be a result of timing, with changes in the policy environment being made as a result of high HIV prevalence. However, it may reflect aspects of the environment not captured here. For example, despite the legal availability of methadone for PWID in prison in the Republic of Moldova, availability is relatively low and access is limited. It is not available in community settings, which means that many PWID who may want to use OST are unable to, and if they do manage to access it inside or outside of prison, they may not be able to continue if those circumstances change. [89] Less than 50% of PWID having access to OST in Europe with coverage lowest in the East (see above).

Case Study 4.3 Evidence of commitment to HIV prevention

One of the most straightforward ways to measure the level of a government's commitment to HIV prevention is to measure how much money they spend on it. Examining the amount (USD) spent per capita on HIV prevention against HIV prevalence among PWID may allow us to draw crude comparisons between the countries in the region where this data is available. The most spent was reported by Luxembourg and Greece at over US$5.00 each per capita, followed by Estonia at US$4.93. The least reported spent was in Malta, Cyprus and Bosnia and Herzegovina with less than US$0.10 spent in each per capita. Although they are relatively low prevalence countries, Azerbaijan and Poland, with around one in 10 PWID infected with HIV reported only marginally more, at US$0.10 and US$0.11 spent per capita each. There was some evidence of an association between the money spent on HIV prevention per capita and HIV prevalence among PWIDs (Figure, below). With the exception of Estonia, it is clear that countries with higher reported HIV prevalence among IDUs are among those reporting HIV prevention spending per capita at the lower end of the spectrum. While in the first plot prevalence appears to increase with each extra dollar spent when looking at all the data, when focussing on the interquartile range, excluding the more extreme values of expenditure per capita, the prevalence appears to decrease for every 0.10 USD spent, suggesting some association that is not best characterised by a linear relationship. It could well be that there is an optimum amount of money per capita that needs to be spent on HIV prevention before prevalence declines or that expenditure needs to be focussed on targeted interventions.

It is important to highlight the limitations around this variable, which is subject to considerable reporting bias. Data on HIV prevention spending per capita were collated from the Dublin Declaration[90] and can include a wide range of interventions. Some countries include ART, while others do not. It may also be that countries receiving international funding will more accurately report expenditure that countries without external funding or with more integrated health systems that cannot disaggregate HIV prevention funding from broader sexual health services.

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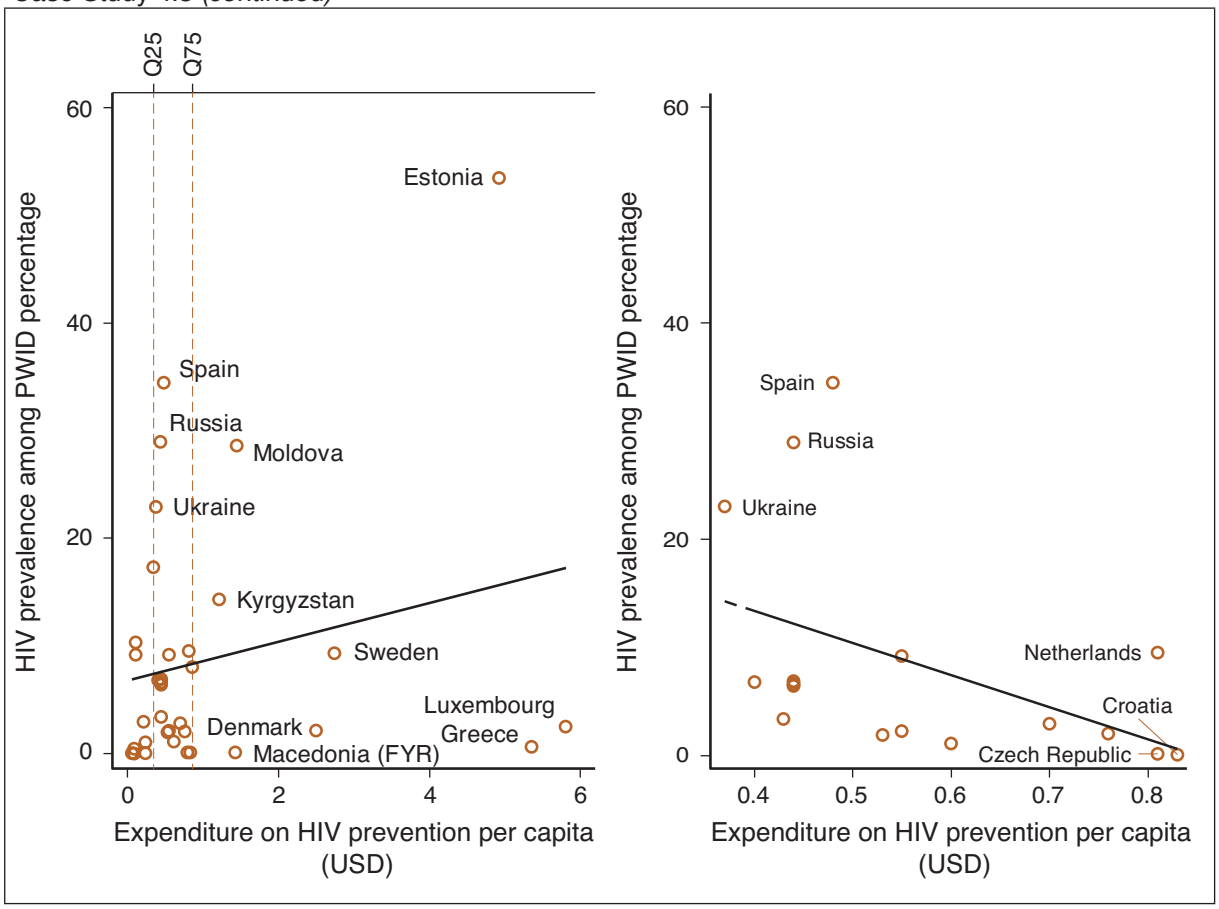
Case Study 4.3 *(continued)*



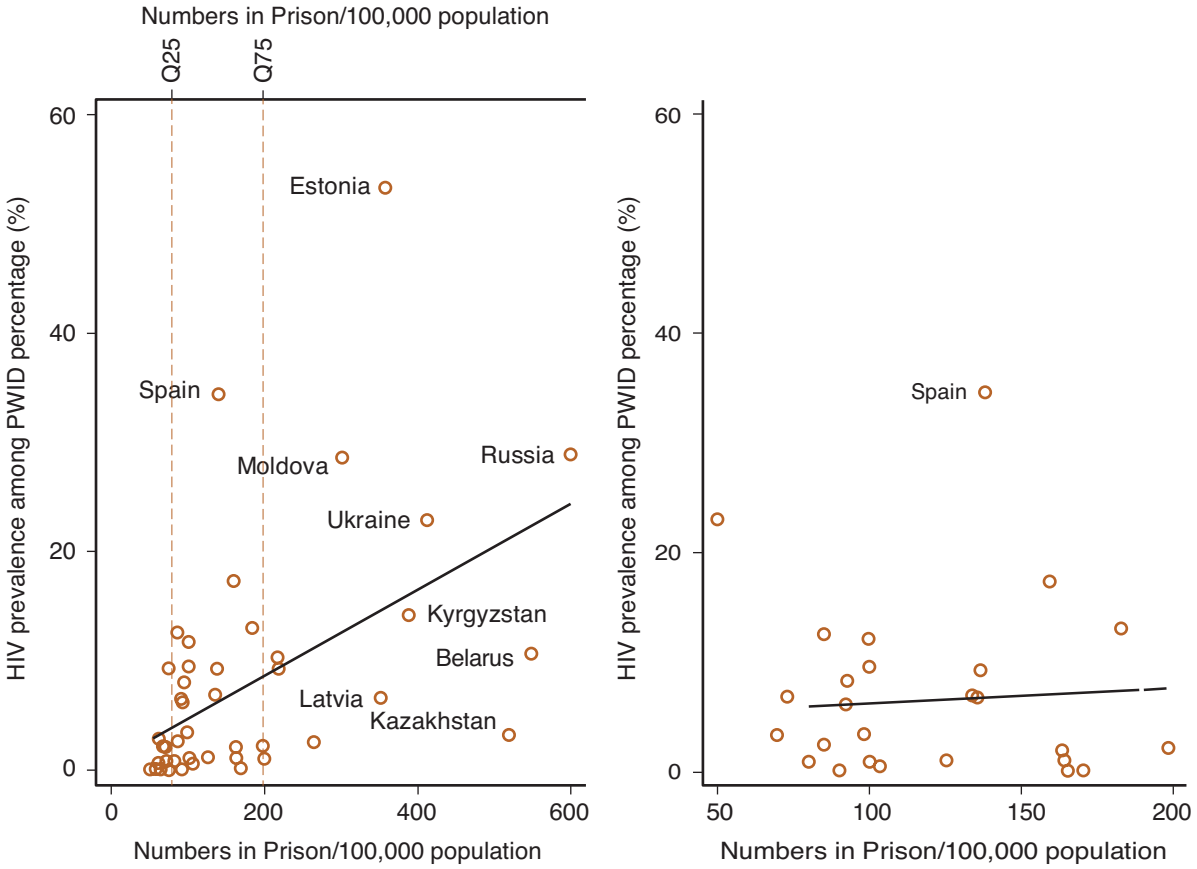
Source: Dublin Declaration Progress Report 2010. [90]
Notes: Relationship between HIV prevalence among PWID and per capita HIV prevention expenditure, left graph) among all countries, and, right graph) restricted to the middle 50% of countries only; PWID = people who inject drugs; USD = U.S. Dollars.

Further, it is important to note that the distinction made in the index between drug use being regulated as an administrative offence being indicative of a more supportive environment may be arbitrary in some settings. Although findings from our systematic review show higher rates of arrest and incarceration among PWID in the East where drug possession is more frequently associated with criminal rather than administrative penalties, even in countries where possession of drugs is an administrative offence, a high proportion of PWID report experience of prison. This suggests that other factors increase vulnerability of PWID to arrest and imprisonment and these factors also need to be explored.

Criminalisation as a feature of the HIV risk environment

The data gathered from the systematic review suggest that contact with police and time spent in prison can be linked to increased risk of HIV. Case study 4.4 provides an illustration of how policing practices can mediate risk. Drawing on the average national prison populations in the region (see Chapter 1, Methods) we find a positive relationship between the HIV prevalence among PWID and the number of people imprisoned in a country (Figure 4.12). For every additional person imprisoned per 100,000 population in a country, the HIV prevalence among PWIDs in the country increases by 0.039% (95% CI 0.019 – 0.058%). The majority of countries with high rates of incarceration are in the East which may influence the relationship. However, by excluding the countries with the very high and very low rates the positive association remains, although much weaker and indicates that even among countries with similar, and moderate, rates of incarceration, the relationship with HIV prevalence among PWID exists. The links between incarceration and individual risk of HIV are well documented (see Chapter 3), yet the relationship at a national level is less clear and is likely to be mediated by an interplay of social factors, such as historical levels of investment in criminal justice and public health systems and national cultural responses toward criminal justice.

Figure 4.12 Associations between HIV prevalence among PWID and numbers in prison



Source: World Prison Population List (7th Edition), International Centre for Prison Studies.
Notes: Among all countries (left), and among the mid-50% of countries (right); PWID = people who inject drugs.

Case Study 4.4 Contact with criminal justice systems in Central Asia

Kazakhstan has the strictest drug laws in Central Asia with penalties of up to 20 years imprisonment possible for possession of between 0.01g and 1g of heroin which is considered a 'large amount', sufficient for criminal rather than administrative punishment. [92] In addition to this there are documented reports of police planting drugs on drug users as well as extorting bribes from them and their families. Harassment, physical violence and unauthorised arrests of PWID by the police are reportedly not uncommon. [93] Qualitative studies have noted similar findings in other parts of Eastern Europe. [94]

Kyrgyzstan reports good working relationships between NGOs working with PWID and Ministry of Interior officials and senior police who support harm reduction services for drug users. However, a study in the high prevalence areas of Osh and Jalal-Abad among 73 female PWID revealed that half had spent time in prison, primarily for the possession of small amounts of drugs. There are almost no HIV prevention interventions in prisons for women. Some respondents could recall up to 50 instances of detention by the police, many of which took place near drug dealing points although the dealers themselves were apparently left alone. Bribes, free sex and information were required by police for their freedom. [95] A study in Bishkek among drug users reported that about 36% get their drug supplies directly from the police. [96]

Tajikistan also reports police harassment and physical abuse towards PWID and this is recognized in the 2007 – 2010 national HIV prevention strategy as a major reason for poor uptake of HIV prevention services by PWID. [97] Similar to Kazakhstan and Kyrgyzstan, evidence suggests deep corruption within Tajik law enforcement agencies, who provide (confiscated) heroin to favoured dealers and plant drugs on users to fulfil arrest quotas and extort money, information or sexual favours. [98]

Interventions that specifically aim to decrease the occurrence of new infections and mitigate the impact of infections that occur among PWID are generally aimed at changing the individual behaviours of PWID and may do little to alter the broader risk environment. [48] A growing body of evidence substantiates the role played by social-structural factors in shaping HIV risk and by social-structural interventions in HIV

prevention. [2, 49, 82] Case study 4.5 provides an illustration of national policy change oriented to removing the adverse effects of criminalisation on HIV risk and HIV prevention.

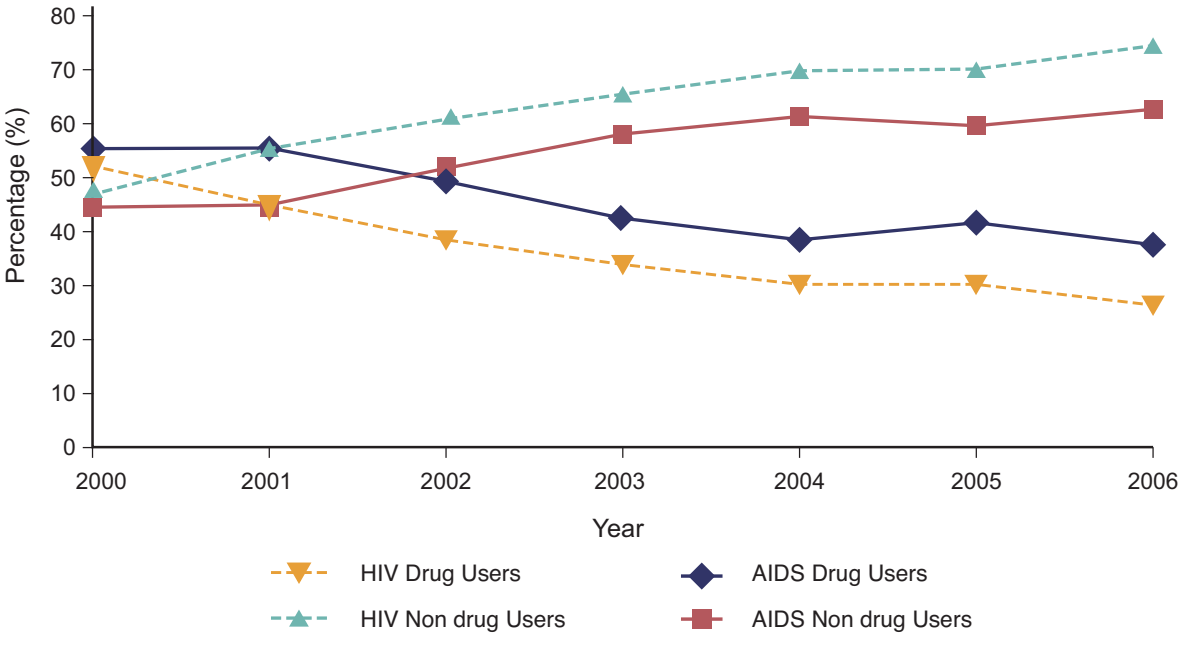
Case Study 4.5 Trends towards an enabling environment: Portugal

Despite generally low drug use among the population as a whole compared with the rest of Europe, Portugal has suffered from relatively high rates of heroin use and HIV among PWID. Following the recommendations of a report by the Commission for the National Strategy to Fight against Drugs, the Portuguese government took the significant step of becoming the first European country to explicitly decriminalise drug use and personal possession, a law that took effect in July 2001. [99, 100] Crucially, in addition to moving from criminal to administrative punishment for using and possessing drugs, the strategy called for a number of additional principles for guiding action in this area. The National Operational Plan for Integrated Responses (PORI) was put in place and localised rapid assessments of the situation and needs at the structural, community and individual levels were carried out so that Programmes of Integrated Response (PRIs) could be put in place. These included access to primary prevention and harm reduction interventions and reinforcing social reintegration and drug treatment for drug users as alternatives to prison as well as a number of other measures focussing on supply reduction and increasing the resources invested in the area, with an additional 10% increase in funding for treatment and harm reduction services annually for three years. [101]

Although the impact of the new policy is yet to be fully evaluated, a report published in 2009 [101] showed that in the subsequent seven years following the enactment of the law, changes in lifetime prevalence of drug use did not differ significantly from trends seen in other European countries, and the massive increase in drug use, as feared by opponents of the new law, did not materialise. It is notable that lifetime prevalence of drug use had in fact decreased among those aged 18 or under, an important age group in terms of future drug trends. [102] This decrease has been seen among all drug types. In addition the number of drug related deaths has declined from nearly 400 in 1999 to 290 in 2006 and HIV and AIDS notification among drug users has decreased, both in total numbers and in the proportional share of the national burden. [103]

Importantly in terms of limiting the spread of HIV and other drug related harms among those already using drugs, Portugal has seen a huge increase in the number of people in substitution treatment, detoxification, therapeutic communities and half-way houses since the change in law. This has been attributed to multiple factors including: a reduction in fear of punishment previously associated with admitting drug use; the ability to seek treatment freely in an environment with increased capacity for dealing with drug use; increase in resources and the number of treatment places available; and reduced waiting times for treatment. [104]

Although the impact of the new strategy is yet to be fully evaluated, several reports have already been published interpreting the early results of the policy. [101, 106] Drug policy tends to excite polarising opinions and it is possible that data has been selectively used to support arguments on both sides of the debate. [107] However, it is likely that the improvements seen in health and social outcomes for people who use drugs in the past 10 years can be attributed to a comprehensive and coordinated national strategy that are not centred around legal solutions, but instead place reducing harm and promoting treatment as the core tools with which to achieve their goals. [108]



Source: Institute on Drugs and Drug Addiction, p. 26. [105]

4.3 HIV prevention responses among sex workers

In this chapter, we consider selected targeted interventions in the development of HIV prevention responses for sex workers, especially female sex workers. We then consider aspects of the policy environment mediating HIV risk and prevention and emphasise the need for social-structural intervention responses to target harms associated with sex work in addition to STIs and HIV.

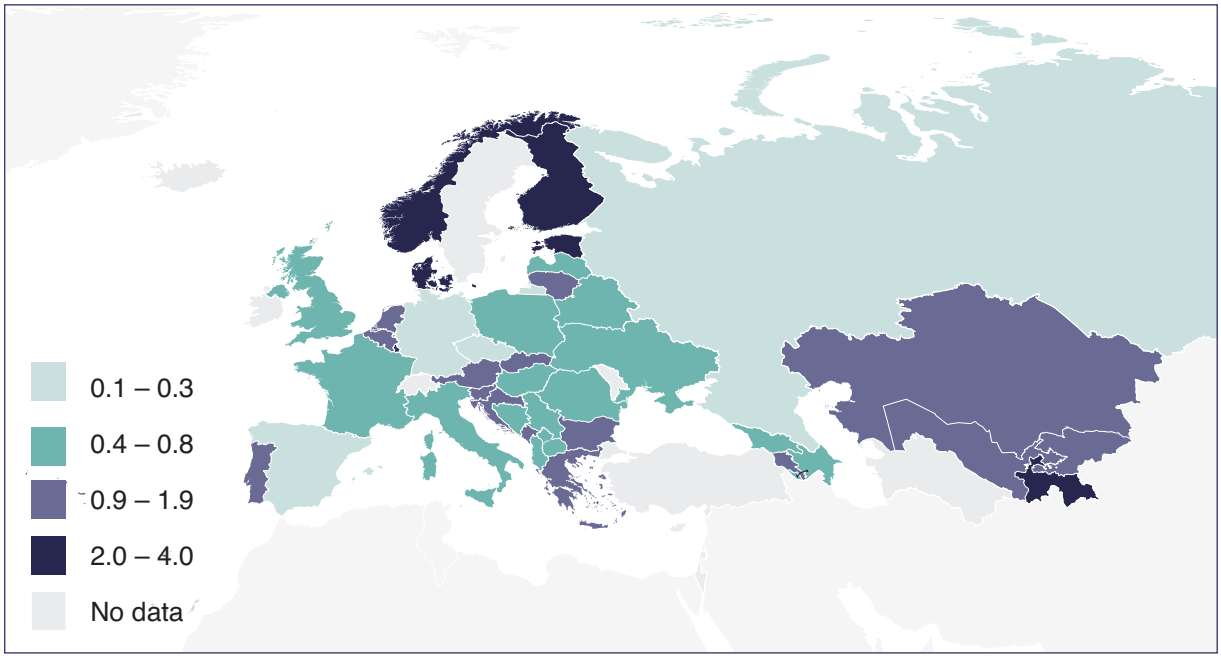
4.3.1 Targeted HIV prevention for SWs

Specialist services and coverage

There is a wealth of evidence showing the positive impact of specialist services in reducing risk of HIV and STIs among SWs from both Europe and internationally. Targeted services have the advantages of opening at convenient times and staffed by people familiar with sex work related issues and non-judgemental. [1] Yet in many parts of Europe the provision of specialist services is low and with a narrow focus on STI/HIV treatment rather than addressing broader social and health issues that affect SWs (see Case Study 4.6). We collated data on the number of specialist services across the region for SWs providing a range of social, legal and sexual health services. These data exclude STI services provided at general STI clinics. Across the region, the Russian Federation, Slovenia, Spain and Germany have the fewest number of sex worker targeted services (<0.2 per 1000 FSWs). Finland, Norway and Luxembourg have the largest number (>2.8) (Figure 4.13).

Other data collected on coverage achieved by STI/HIV clinics are inconsistent and patchy. For example, the WHO indicator documenting the number of targeted service delivery points for sex workers where STI services are provided was only completed by nine countries in 2008. [2] Within these countries interpretation of the indicator varied. For example Germany and Hungary included all dermatovenerology services that treat sex workers so report 350 and 125 services respectively, whereas some countries report that they have no specialised services and did not include general STI services. Serbia report a total of five NGO implemented preventive programmes among SW in 5 cities. [2]

Figure 4.13 Number of specialist sex worker services per 1,000 FSWs



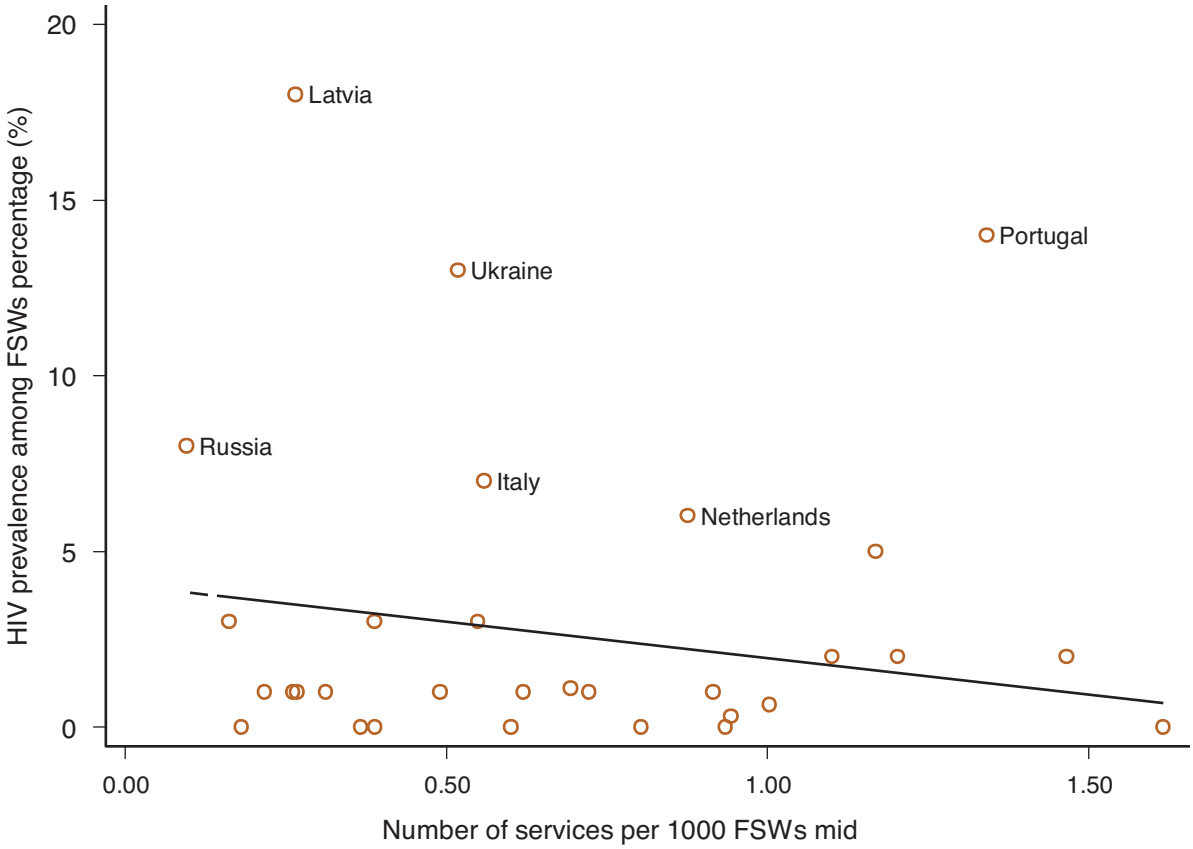
Source: services4sexworkers.org; Global Fund; International AIDS Alliance; TAMPEP.
Notes: Services offered include a wide range of ***sexual health,*** social support and legal services and excludes standard STI clinics and health services that treat non-sex working populations.

UNGASS indicators monitoring sex work measure the proportion of sex workers reached with an HIV prevention programme in the last 12 months; the proportion of female and male sex workers reporting

the use of a condom with their most recent client; and the proportion of SW who are HIV positive. There has been no analysis of these indicators published, but an analysis of indicators for PWIDs suggest that reporting is inconsistent across the countries. [3]

We looked at the relationship between numbers of services per 1000 FSW population and the prevalence of HIV among FSW (Figure 4.14). When looking at the relationship between HIV and numbers of services restricting the analysis to the mid-range number of services, HIV prevalence appears to decline in relation as the number of sex worker specific services increase. It is worth noting that the scatter of data points around the regression lines are not very evenly distributed and that while a relationship may exist between the variables it may not be best represented by a straight line. However this analysis does point to the importance of treating HIV/STI in the context of broader social and health issues relating to sex work.

Figure 4.14 HIV prevalence and number of services per 1000 FSW population



Source: Data collected from: services4sexworkers.org; Global Fund; International AIDS Alliance; TAMPEP.
Notes: Data restricted to the mid 50% range. FSW = female sex worker.

HIV testing

Across the region mandatory health checks including HIV testing of sex workers exists in Austria, Greece, Switzerland, Latvia, Turkey and Hungary only. HIV testing in the Central Asian Republics is compulsory and in other countries in the region frequently enforced following arrest or imprisonment. A qualitative study showed how forced HIV or STI testing following arrest was used by the police as another way of extorting bribes or controlling sex workers. [4] A study of HIV testing patterns among sex workers in St Petersburg suggested that the majority of women had been tested for HIV (97%) but that a large proportion had not voluntarily sought out testing but it had occurred during ante-natal care or in prison. [5]

In the United Kingdom, a sample suggested 37% of FSWs were tested for HIV in the last 12 months. [6] Of the 31 HIV positive SWs recruited in the study in the Netherlands, 23 (74%) were unaware of their HIV positive status. [7] In the Russian Federation proportions of female sex workers reporting ever being tested for HIV was overall high, above 37%. High coverage is partly explained by the widespread availability of HIV testing in the region encouraging voluntary testing, as well compulsory testing following police arrest or imprisonment. A study examining factors associated with no history of HIV testing found that younger women engaging in sex work for less time and who reported sharing drugs with clients had increased odds of not being tested for HIV, suggesting that the HIV screening programme is missing some of the more vulnerable sex workers. [8] Similar to the East, access to HIV testing was high among samples of sex workers, over 50% had been tested in Bulgaria, Croatia and Romania [9 – 11] and between 28% and 40% in Kosova and Bosnia & Herzegovinia. [12 – 13]

Case Study 4.6 Sex worker services in East Europe

In the East, the vast majority of services for sex workers are attached to harm reduction services for PWID, which may have a separate component conducting outreach or providing sexual health information for sex workers. There is some evidence to suggest male PWID resent women attending these services, which may restrict attendance by FSWs. [14] Evidence from the US, suggests that street sex workers using drugs receiving an enhanced intervention for sex workers engaged in less unprotected oral sex and experience less sexual violence than those receiving a standard harm reduction intervention for drug users, suggesting that targeting interventions for sex workers are important. [15]

The majority of harm reduction projects provide STI/HIV screening services for sex workers, but don't address broader sexual health issues. [16] Other evidence from East Europe reported barriers to sexual health services including a lack of linkage between sexual health and drug treatment services as well as concerns about losing custody of their children. Data from the Russian Federation suggests that pregnant drug users have poorer access to ART to prevent mother to child transmission than non-drug users. Data from the region shows that mother to child transmission rates among HIV positive IDUs are higher than among other HIV-positive women. [14] Specialist services for sex workers in the East need to expand to focus on broader sexual health issues.

Managed street zones

Findings from the systematic review indicate that working on the street can increase risk of HIV among SWs. Previous research has shown that street-based women are more vulnerable to physical and sexual violence than off-street working women [17] and are more prone to arrests and problems with the police. However, street sex work has some advantages for women, in that they are more mobile, there are fewer time restrictions and it is easier to work intermittently. From the perspective of services it is also easier to find street sex workers for the provision of interventions. [18 – 19] It is evident that strategies are needed to increase safety among street SWs, some examples of how the organisation of sex work can be set up to minimise risk in street and off-street settings is given in Case Study 4.7 below.

There are currently nine countries in Europe that have managed street sex work zones (Austria, Belgium, Czech Republic, Germany, Greece, Hungary, Luxembourg, the Netherlands and Switzerland). The purpose of these areas is to provide a place where sex workers can sell sex without fear of arrest as well as move sex work away from residential or business areas. More established systems such as those operating in Utrecht (the Netherlands) provide security cameras to deter assaults on SWs as well as health and social services, restrictions on drug use and drug dealing and a registration system for sex workers operating from the area. [20] There is some evidence from Germany and the Netherlands suggests that regulatory provision through managed street sex work zones reduces incidences of violence and insecurity. [19] Legislation introduced in 1999 in Hungary made the establishment of a 'tolerance zone' in urban areas populated by more than 50,000 inhabitants to be mandatory. Despite this only two zones were set up in the towns of Miskolc and Nyiregyhaza; both were greeted with intense protests from local communities; to such an extent that the Nyiregyhaza zone was dissolved. The legislation failed to provide detail on how the zone should operate or what authority was responsible for its

upkeep. As a consequence the remaining zone in Miskolc has little infrastructure and is run by criminal gangs. Projects report that the new legislation resulted in more abuse of sex workers by clients and police rather than less. [21]

Case Study 4.7 The importance of location and organisation of sex work in facilitating safer sex work: examples from Tallinn and Moscow

In Moscow, street-based female sex workers are hired for a fixed price rather than a specific service and time. This can make a woman more vulnerable as she has to negotiate the service particularly if she is outnumbered. Sixty-eight incidents of gang rape by multiple clients have been reported in qualitative studies among female sex workers in Moscow. [22 – 23] In other Western European countries street workers negotiate a specific service and a price prior to leaving with the client and employ safety strategies such as working in pairs or groups, or noting down car registration numbers of clients. [18]

Sex work in Tallinn (Estonia) however, almost exclusively operates from apartments and hotels, with street sex work mainly confined to drug users. Sex work is widely dispersed throughout the city. Soliciting and locating clients is conducted on the internet, via mobile phones and through taxi drivers who act as both pimp and security guard. This system illustrates a supportive working environment, as drivers provide effective security and screen clients for drunkenness and potential disruptive behaviours. [24]

Qualitative data from Central and East Europe suggests that sex workers working in off-street locations experienced higher levels of sexual and physical violence from clients when there was a lack of cooperation from managements that supported women's ability to refuse certain clients or provide certain services. [4] [25] Research from the United Kingdom suggests that women who work off street employ a range of safety strategies to prevent and manage violence, including the use of security cameras, secure doors with peep holes, employing receptionists to screen clients and working in groups. Both sex workers and receptionists' interpersonal skills were judged to be of paramount importance including the use of humour and ability to diffuse a tense situation. [25]

Outreach work

There is evidence to suggest that the use of outreach workers to distribute condoms, health promotion services and STI testing to sex working locations reduces risk of HIV/STI among off-street and street sex workers beyond the provision of fixed site STI clinics in the United Kingdom and internationally. [26] [1, 27 – 28] With an increasing number of sex workers working off-street, projects use more innovative ways to contact SWs such as: contacting sex workers who advertise their services online by email and sending information about services, reminders about check-ups and other information on a regular basis; or using internet chat rooms frequented by MSWs to promote services. [29]

Interventions with clients

Evidence from review suggests that condom use with clients is high, where condoms are not used this is often related to violence from clients/police, or driven by the need to earn more money or after past experience of condom breakage. Some of these problems could be addressed in part through interventions with clients. There are no documented examples of interventions among clients in East Europe, however there are some examples of innovative intervention in West Europe, particularly in Germany with clients of sex workers. A study in Switzerland, suggested that the provision of HIV testing to men buying sex on street sex work locations resulted in a high uptake of testing and a large proportion who had previously not been tested. [30] One innovative project in Germany targeting clients who want to purchase sex without a condom involved the distribution of cards to men presented in the same style as a sex worker advert. On the end of the phone number is a pre-recorded message with a role play between a client and sex worker discussing why they don't sell sex without a condom. An evaluation of the project showed that following the campaign, there was in an increase in the number of male patients attending the local sexual health clinic. Similarly in France, health promotion experts used Worlds AIDS Day to launch a media campaign to target clients. In Spain, services set up a designated web site for clients informing them of sex work regulation and their rights. [29]

Peer driven interventions

There is some evidence to suggest that peer interventions among SWs in low- and high-income settings have proved successful in increasing condom use, safety and access to harm reduction services [31 – 36].

Other research from the United Kingdom has shown that the peer driven interventions may be complicated by the diversification of the sex work industry. The increased representation of migrant sex workers may reduce opportunities for peer driven interventions. In a qualitative study examining social networks of migrant sex workers conducted in London, findings showed that relationships between colleagues were often limited by transience, competition and racial prejudice, although peer networks were described as being highly effective sources of practical and informational support. [37 – 38] Projects in East Europe report difficulties in recruiting peer outreach workers because of a lack of trust and respect from other sex workers, problems with managers and the transience of the sex work scene. [16] Other barriers implementing peer-driven interventions are concerns from sex workers that overdependence on peer networks in the sex industry may be seen as a potential barrier to ultimately leaving the industry. [38] [39] Studies in the Russian Federation, Serbia and Montenegro found that due to small size of sex workers social networks, as well as the tightly controlled and hidden nature of sex work and inadequate financial incentives, recruitment of sex workers into surveys via social networks was problematic. [40] The lack of specialist services with close links with sex worker populations in these sites may have further limited recruitment efforts. In London, sex workers spoke very highly of specialist sex worker services, a factor that could be harnessed and potentially facilitate more positive interactions between peers in work and non-work settings. [38]

Case Study 4.8 Intervention to reduce violence

An example of a community level intervention to reduce violence is the 'Ugly Mugs' Scheme in the United Kingdom that distributes warnings about dangerous clients, this has been successful in reducing client-perpetrated violence and valued by women. Currently 77% of United Kingdom projects (members of the United KingdomNWSP) run 'Ugly Mugs' schemes. [41] These schemes while valued highly by women, sex worker projects and police have also been criticised for being reactive rather than pro-active and laying the responsibility for preventing violence on the victim rather than focussing on reducing opportunities for violence to occur by increasing safety at work. [19] 'Ugly Mugs' is currently only available in English so of limited use to migrants with poor English language skills; funding is being sought for translation. The majority of 'ugly mugs' schemes are also limited in that they focus on clients. One exception is the 'Sex work Empowerment' project (SWEET) in Huddersfield that records all incidents of violence by perpetrator. Data from the project demonstrate that sex workers often experience violence outside sex work. Among the 61 incidences reported in a nine month period in 2007, 34% were related to violence from a client, 31% to a partner or ex-pimp; 31% to other (including: drug dealers; vigilantes; other sex workers etc) and 3% related to violence from family members suggesting that interventions are needed to reduce violence among women universally and not just incidences related to sex work. [41]

The recently established Sex Workers' Rights Advocacy Network (SWAN) advocates for reduction in violence against sex workers in countries of Central and East Europe and has participating organisations in each of the following countries: Montenegro, Albania, Bulgaria, Czech Republic, Hungary, Kazakhstan, Kyrgyzstan, Latvia Lithuania, The former Yugoslav Republic of Macedonia , Poland, Romania, Russian (Barnaul, St Petersburg), Serbia, Slovakia, Ukraine. One advocacy tool has been to document sex workers' experiences of violence including police violence and disseminating findings in a report. [4] This is an important step forward in addressing violence against SWs in the region.

4.3.2 POLICY ENVIRONMENTS MEDIATING HIV PREVENTION AMONG SWS

Legislation

Legislation regulating sex work is one of the most important structural factors influencing the health and safety of SWs. There is clear evidence of the influence of different policies and related activities in promoting supportive or discriminatory practices towards sex workers and their subsequent impact on the ability of sex workers to access necessary services and protect their rights.

Legislation of sex work in Europe is largely characterised by a prohibitive model that does not criminalise the act of selling sex (most countries in the West) (Figure 4.15), but criminalises activities around it such as working in groups or running brothels which can limit sex workers' ability to organise their work safely (Denmark, France, Iceland, Ireland, Italy, Sweden and the United Kingdom) (Figure 4.16). In most countries in the Centre and East (with the exceptions of Hungary, Latvia and Slovenia) the act of selling sex is constitutes a criminal or administrative offence.

In countries where sex work related activities are decriminalised (such as the Netherlands or Germany), is often accompanied by licensing and regulation of sex work. Critics of decriminalisation argue that by distinguishing between legal and voluntary and illegal involuntary sex work may further marginalise the most vulnerable under-aged, coerced or non-resident sex workers.

In Germany and the Netherlands, benefits of regulation (such as social welfare) are denied to migrant sex workers without legal residency rights who are not accorded the same rights as non-migrants. [43] [44] In other countries (Austria, Greece, Switzerland and Turkey) where sex work related activities are also legal, a system of mandatory testing operates. Some international evidence suggests that mandatory testing reduces access to STI clinics for more vulnerable populations. [45] However, research in Mexico suggested that sex workers registered at a municipal health department used more condoms than non-registered sex workers. All sex workers were involved in a behavioural intervention, but findings suggest that registration may play a role in reducing sexual risk behaviours. [46 – 47] In all countries in East Europe (Estonia and Lithuania excepted) mandatory testing for HIV/STIs has been frequently reported by sex workers and projects irrespective of whether sex work is unregulated or a criminal offence. Testing is generally conducted following detention or arrest by the police, although there is no official legislation enforcing mandatory testing. [4, 16]

Box 3. Models of regulation

Across Europe, sex work legislation can be categorised into four groups:

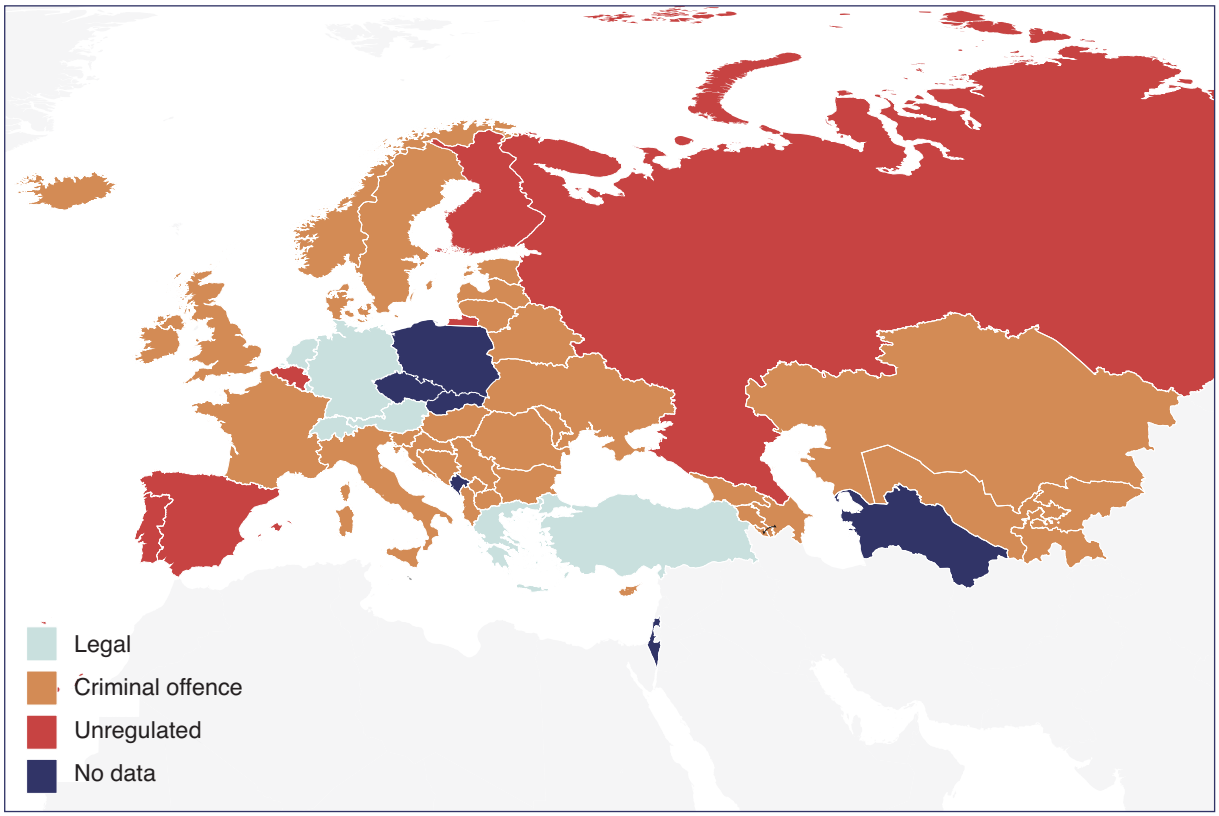
1. Regulatory system which involves registering and licensing everyone working in the sex industry.
2. Decriminalisation which involves the removal of most of the criminal penalties applying to adult sex work.
3. Prohibitionist system that prohibits or criminalises most or all aspects of sex work.
4. Abolitionist system designed to abolish systematic sex work such as soliciting and living off the earning of a sex worker. [42 – 43]

Figure 4.15 Map presenting legal status of selling sex in Europe

Sources: services4sexworkers.org; Global Fund; International AIDS Alliance; TAMPEP. [4, 50 – 52]

An abolitionist model of regulation is in operation in Sweden and Norway, which criminalises clients of sex workers. [42] This model has been criticised as it rarely allows sex workers freedom to practice sex work and it is often restricted by local administrative regulations or police harassment. Opponents of this model also state that it is not grounded in reduction of harm to women, [48] but ignores the welfare of sex workers and drives markets into more dangerous areas. [49] [43]

Figure 4.16 Map presenting legal status of selling sex with others in Europe



Sources: services4sexworkers.org; Global Fund; International AIDS Alliance; TAMPEP. [4, 50 – 52]

Structural violence arising from legislation

The International Committee on the Rights of Sex Workers (ICRSW) in Europe has documented multiple human rights violations against sex workers across Europe brought about as a function of sex worker regulation policies or as a result of prejudice and stigma associated with sex work. In Finland legislation prohibiting a third party from profiting from sex work or 'pimping' has lead to sex workers being banned from working together for their own protection without facing prosecution for 'pimping' one another. Similarly in France a sex worker's child, upon reaching the age of majority, may be prosecuted with 'living off' the sex worker's earnings. In Portugal sex workers lose custody of their children through social services or family courts solely because of their occupation. Other violations include refusal of access to health care in Slovakia on the grounds of occupation and not being able to marry while working in sex work in Greece. [44]

Police-related violence

Police violence was most frequently reported in countries of East Europe where mostly the act of selling sex is a criminal or administrative offence and activities related to sex work are either unregulated or an administrative offence, creating opportunities for police corruption and abuses of sex workers within the legal system. Sex workers report incidences of violence from the police, administered during detention or at sex work locations. Reports from projects and qualitative studies in 11 countries across the region highlight police involvement including demands for financial remuneration or sex in lieu of rent or avoid-

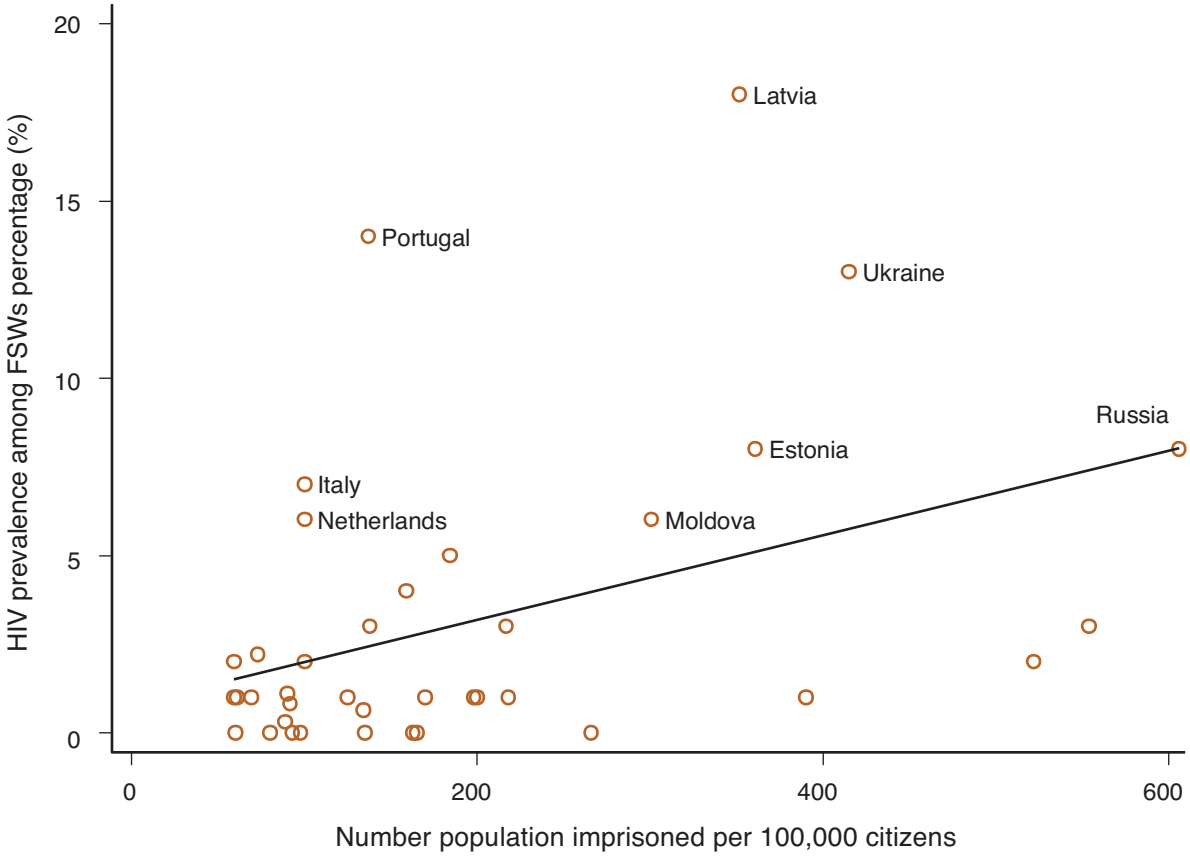
ing arrest. [4, 14] Police involvement in the sex industry often means that women have nowhere to report other incidences of violence, particularly when police are the perpetrators. [4, 22, 53 – 54] Fear of violence from police and a lack of legal recourse further entrenches the stigma attached to sex work. [14] Other qualitative work from the region document very high levels of sexual and physical abuse from the police. [55] Police violence can increase risk of HIV both directly by confiscating condoms as evidence or forcing women to have sex, as well as indirectly reducing their income through the enforcement of bribes thereby increasing financial pressure and the need to engage in higher risk behaviours such as selling sex without a condom to make up for the loss of income. [4, 54, 56] The threat of police violence also reduces sex workers ability to work independently and increases their need for boyfriends or pimps to be involved in their work.

There is little evidence showing that any criminalisation of sex work reduces the demand for sex or the number of sex workers. [57] We looked at the relationship between prevalence of HIV among FSWs and size of prison population at a country level (Figure 4.17). Prevalence of HIV increases with numbers in prison per 100,000 people. There are well documented reasons why prison and individual level risk of HIV are associated, but at a national level the reasons may be different. One possibility is that the indicator is a proxy for a national attitude towards prison as a punitive rather than rehabilitative environment but the relationship serves to demonstrate the detrimental effects of punitive approaches to sex workers on HIV. At a macro structural level, some researchers state that prohibitionist and abolitionist polices that criminalise the purchase of sex reinforces negative attitudes and violence towards sex workers. Opinions on sex work and violence is dominated by the idea that by engaging in a criminal activity such as sex work you are knowingly exposing yourself to violence and therefore somehow at fault. [58] [41] Evidence suggests that prohibitionist policies such anti-kerb crawling strategies serve to disperse sex workers widely, restricting women's abilities further to work in groups and look out for each others' safety. [41] Other evidence suggests that sex workers in the unregulated street-based sector had poorer mental health than those working in regulated off-street locations. [59] In comparison the mental health scores of off-street sex workers were no worse than among women who did not sell sex. [60 – 61]

Research from Europe and internationally has shown that criminalisation and enforcement-based approaches towards sex work can increase risk of physical and sexual violence against women [62 – 64] as well as risk of STIs, [48, 65] increasing stigma, loss of children, problems with family and friends and housing. [48] Policies and legislation connected to sex work should focus on facilitating safer working environments rather than enforcement approaches that can further marginalise women. The recent UNAIDS report on HIV and Sex work define good practice in relation to both public health and human rights to be creating a legal and policy environment where policies regulating sex work do not violate sex workers' rights or dignity (including avoiding mandatory testing as part of regulation), or hinder access to due process of law, but policies that promote work place safety and protection from violence, exploitation and discrimination and ensure unimpeded access to HIV prevention, treatment and care. [57] Case study 4.8 above describes some successful interventions to reduce violence among SWs.

The ICRSW have put together the Declaration of the rights of sex workers in Europe in 2002. This document sets out the current violations of the rights of sex workers across Europe, affirms the rights sex workers have under current human rights legislation in Europe and identifies measures that need to be taken by states to respect, protect and fulfil the rights of sex workers. This declaration was elaborated and endorsed by 120 sex workers and 80 allies from 30 countries at the European Conference on Sex Work, Human Rights, Labour and Migration in, Brussels, Belgium. [44] Fourteen other discrete advocacy projects were identified in Austria, Belgium, Czech Republic, France, Germany, Italy, Norway, Slovakia and Spain that target the general public, policy makers and police to raise awareness of sex workers rights. [29] Governments and policy makers need to work closely with sex workers and sex worker advocacy groups such as the ICRSW when designing policies and health programmes for sex workers in order to ensure that interventions are designed on the needs of sex workers in that local area to enable more effective policies and programmes. [57]

Figure 4.17 HIV prevalence among FSWs and the size of the prison population



Source: World Prison Population List (7th Edition), International Centre for Prison Studies [66]

Social structural interventions

There is a growing body of evidence demonstrating the effect of structural interventions in HIV prevention among SWs in changing the context of risk. [67 – 71] Structural interventions that promote community mobilisation have been the most comprehensively documented. Evaluations have shown that encouraging SWs to advocate for their rights with the police, brothel owners and clients to implement HIV interventions at work; as well as organising interventions to reduce illiteracy; increase child immunisation and providing legal advice can reduce HIV/STI prevalence and improve health and safety of SWs. [68] [1, 72] A recent evaluation of a community mobilisation intervention in India showed that exposure to the intervention was associated with consistent condom use as well as increased control over type of sex sold and the amount charged. [73] The intervention combined a traditional HIV intervention strategy using peer educators distributing condoms and promoting condom use as well as promoting a sense of collective identity and agency through promoting the idea of sex work as labour as other manual labour and encouraging the organisation of community–based organisations for sex workers and led by SWs.

There is also evidence showing the impact of national policy changes in reducing HIV risk behaviours such as the national campaigns that promote 100% condom use for example in Thailand and the Dominican Republic. [74 – 75] Other evidence shows the importance of economic interventions and micro-finance at a community level to reduce poverty with the result of reducing the number of sex work clients. [76] [68, 72, 77 – 78] Evaluating the multiple determinants of health that are affected by structural interventions is complex. While methods of measuring the size of effect between structural factors and HIV prevalence or risk behaviours are well established, it is harder to measure or recognise the pathways that link the levels of determinants [79] and as a consequence it is difficult to establish which aspects of the structural interventions are effective and why. [1] Methodological developments are needed to facilitate evaluation

since the need for structural interventions and removing structural barriers is increasingly recognised as a core strategy of HIV prevention for SWs. [80 – 81]

4.4 HIV prevention responses among men who have sex with men

We draw here upon a variety of data sources, including data from the systematic review, European Men's Internet Survey (EMIS) and other international evidence to describe the HIV prevention context for men who have sex with men in Europe. We draw attention to the role of selected targeted interventions in HIV prevention as well as how the legislative and policy environment and mediates individual and community capacities for risk reduction.

4.4.1 Targeted HIV prevention for MSM

Two recent reviews have focussed on the effectiveness of HIV prevention interventions targeting MSM. [1 – 2] In the first review, [235] strategies found to be effective in reducing unprotected anal intercourse (UAI) among MSM included individual, small group, and community level interventions. Individual level interventions included counselling and the provision of social and behavioural support. Small group and community interventions included group counselling or workshops, interventions targeting community-wide areas, training community leaders, and community-building empowerment activities. [1] The majority of the studies were conducted among predominantly white communities in high income countries, limiting the generalisibility of the findings to the lower and middle income parts of Europe. The second review [2] found associations between peer education and gay-specific GUM services to be inconclusive. Cognitive behavioural techniques and sexual diary keeping aimed at reducing the number of self-identified high risk men reporting sero-discordant or unknown status UAI were found to be more effective than standard counselling interventions alone. We further summarise evidence relating to the coverage of selected targeted interventions below.

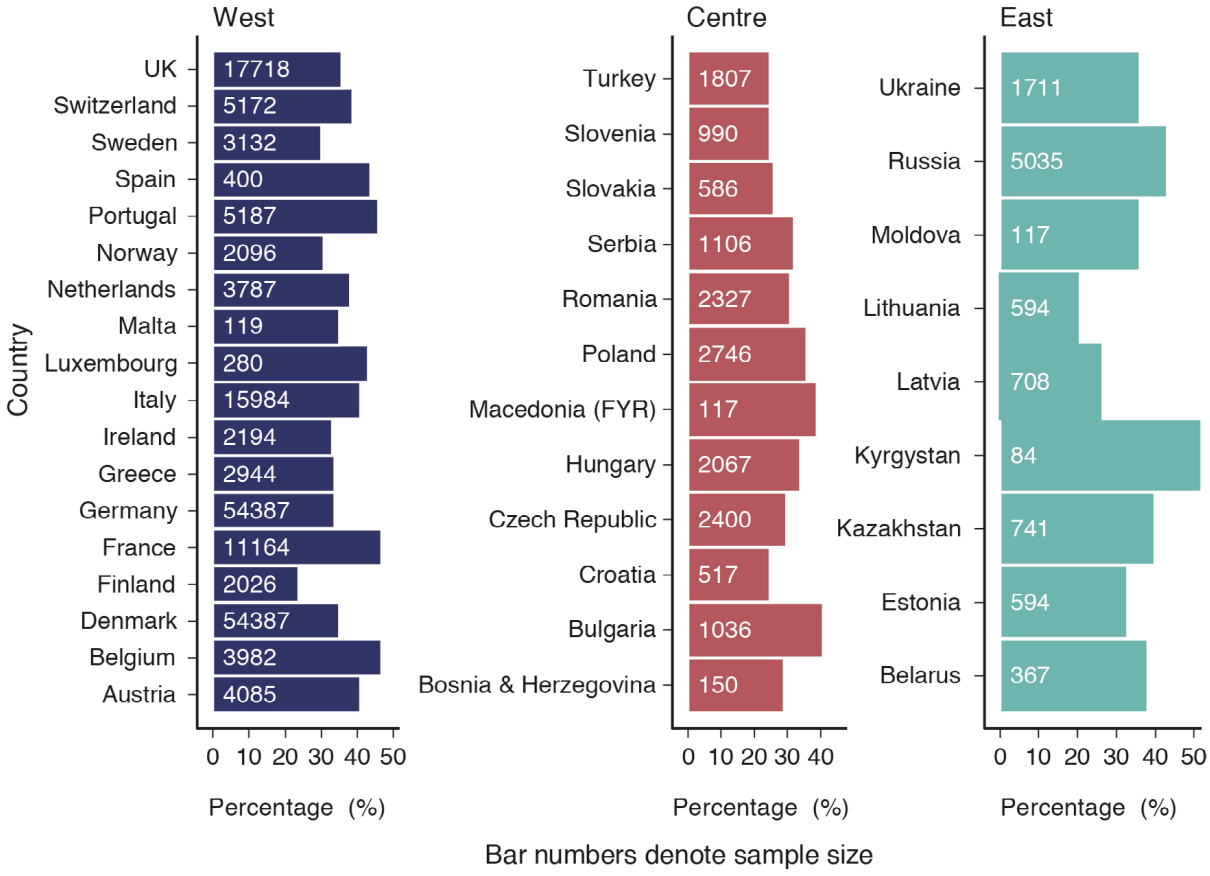
HIV testing interventions

It is desirable for both public and individual health that people know their correct HIV status. In most circumstances HIV testing is the only route through which this can be achieved. The ongoing validity of HIV test results is called into question by subsequent risk behaviour, so the extent of HIV testing required in a population to ensure extensive and correct knowledge of HIV status will depend on the level of sexual risk behaviours in that population.

HIV testing interventions also provide an opportunity for MSM to access other prevention interventions, such as counselling. There is evidence from the Ukraine, Croatia and Hungary that HIV testing is associated with increased condom use. [3 – 5] This association however is more likely when post-test counselling is undertaken. [4] The coverage of HIV testing interventions can be summarised by the proportion of MSM who have ever tested and the proportion that have tested in the last year. The proportion of MSM who have ever tested for HIV is variable across Europe, including for instance, 70% in Germany (recruited in 2006) [6] and 54% in the Netherlands (recruited in 2002). [7] Moreau-Gruet et al (2006) found that 72% of Swiss MSM (surveyed online) had HIV tested in the last three years. There is some evidence that levels of HIV testing may be increasing in the United Kingdom, [8 – 9] Denmark [10] and Switzerland. [11]

Recorded rates of HIV testing in the last 12 months also vary within and across sub-regions Figure 4.18. In the East it varies from 13% in Tajikistan to over 40% in Bulgaria, the Russian Federation, Georgia and Kazakhstan. As a key public health intervention, HIV testing should be free of charge. In much of the region, this is not yet the case, and such fees may be a barrier to uptake. In Georgia, study participants cited unemployment and the cost of health care as barriers to seeking VCT services. [12] Provision of widespread and accessible HIV testing and treatment services are an essential element of a national HIV response. Ensuring these services meet the needs of MSM should be a priority of service policy.

Figure 4.18 Proportion of MSM tested for HIV in the last year and receiving a result



Source: EMIS except Kyrgystan and Kazakhstan. [13 – 14]

Anti-retroviral treatment for HIV disease

There have been some promising results from international studies on the efficiency of ART to reduce HIV transmission by reducing viral load in people with HIV. However, there remain questions regarding the practical implications of making HIV prevention a core objective of HIV treatment. Modelling has shown the effectiveness of ART in eliminating HIV transmission in generalised epidemics, including both heterosexual [15 – 16] and homosexual transmission. [17] However, these models do not take account of the much higher risk of transmission from acute cases. [18] Other evidence suggests that the population-level impact of widespread and effective treatment is likely to have only a short-term impact, since anti-retroviral resistance typically takes only several years to develop and spread within a population. [19] In HIV positive men who regularly acquire new UAI partners, the level of suppression offered by ART may decline over time as they acquire resistant HIV through mutation or super-infection. [20]

Other evidence highlights the issue of 'risk compensation', suggesting that in Western Europe where ART has now been available for many years, the practice of UAI is more likely among MSM who reported less concern about HIV prevention because of HAART [19, 21 – 25] (although this was a minority view among the MSM sampled). [24 – 27] In Catalonia, data suggested that HIV positive MSM who believed that ART considerably reduced the risk of transmission were 7.5 times more likely to engage in UAI with casual partners. [21]

As well as ART reducing the infectivity of HIV positive individuals, it is also thought to be able to reduce susceptibility to infection among HIV negative people, thereby reducing the probability of transmission when exposure occurs. A recent review of studies into the effectiveness of ART as pre-exposure proph-

ylaxis (PrEP) located only one study meeting their criteria, and which focused on women and which was incomplete. It concluded that there is no current evidence for the effectiveness of PrEP and that more trials are needed. A recent study not included in the review and involving 2,499 high risk males in a number of countries found PrEP to reduce HIV incidence by 44% (95% CI 15 – 63%), though the strengths of this study are limited by the relatively follow up time used, which did not exceed 2.8 years. [28] Further research is also needed to better understand drug resistance and risk compensation in relation to PrEP. [29]

Strategic positioning and serosorting

With the advent of increased testing and improved access to ART in many countries, especially the West of the region, some MSM are beginning to employ intervention techniques other than condoms to reduce their risk of contracting HIV. One study noted several non-condom risk reduction practices employed by MSM including: (i) strategic positioning (sex with the HIV positive or unknown status partner in the receptive role, the HIV negative partner or unknown status partner in the insertive role, acknowledging that transmission is more effective from the insertive to the receptive partner than the other way around); (ii) serosorting, in which men try to have sex only with those of their own serostatus; and (iii) withdrawal, in which the insertive partner withdraws before ejaculation to limit the risk of passing on infections carried in semen. [30]

Even in Western Europe, only a few studies focus on such interventions. Balthasar et al, [31] used a cross-sectional survey that recruited via the gay press and venues, and online on prominent Swiss gay websites and restricted responses to the 1,689 men who reported at least one episode of AI with a casual partner in the previous 12 months. They found that 67% consistently used condoms, 24% did not, but employed one or more different risk reduction strategies, and 9% did not make any consistent attempt to reduce the chance of HIV transmission. Consistent condom use was similar among those who reported being HIV negative and not knowing their status, at around 70%, but only 48% of HIV positive respondents reported the same. Very few (7%) HIV negative respondents reported using no risk reduction practice at all, compared to 10% of those of unknown status and 48% of the HIV positive respondents. 19% of respondents with unknown status reported using another risk reduction strategy, compared with 24% of the HIV negative respondents and 35% of the HIV positive respondents. 74% of those using a risk reduction strategy other than condoms reported doing so intentionally. Of those using alternative strategies, 50% reported using serosorting, 33% strategic positioning and 62% withdrawal before ejaculation. 53% used one of the three practices, 38% reported using two and 9% reported using all three.

International evidence suggests that of these options, strategic positioning appears to have a greater risk reduction effect than serosorting or withdrawal, with a hazard ratio of 1.54 (95% CI 0.45 – 5.26), not significantly different from the reference category of no unprotected anal intercourse.[32] This study differentiates between ‘serosorting’ as UAI with HIV negative partners, and a more reliable practice, termed here ‘negotiated safety’, which includes only UAI with primary regular partners and requires a number of other criteria that enable a man in a regular relationship to be more assured of his primary partner’s status. [33] This study found negotiated safety to have a hazard ratio of 1.67 (95% CI 0.59 – 4.76), which differs from the more general form of serosorting mentioned above, which was found to have a hazard ratio of 2.17 (95% CI 0.88 – 5.39). Withdrawal was found to have a hazard ratio of 5.00 (95% CI 1.94 – 12.92).

There are epidemiological consequences of serosorting and some evidence that identify this strategy as one of the factors which may underlie the recent rise in German HIV prevalence after successful stabilisation at low prevalence in the 1980s and 1990s. [6] A major risk of serosorting is that newly infected men, unaware of their status will seek HIV negative partners in order to protect themselves, and risk onwards HIV transmission. This could be to an HIV negative partner [6] or to an HIV positive partner who could be reinfected, possibly with a more aggressive subtype or a drug-resistant strain, which would be highly undesirable at an individual level, but also at population level if viral recombination takes place before onward transmission. [2, 34 – 35] Because antibody-based HIV tests produce negative results for

those in acute infection (because the antibody response needs some weeks to develop), serosorting will tend to encourage unprotected sex with these very-high risk individuals. [36 – 37] Studies suggest that around half of transmissions among MSM occur during this acute phase of infection, with clusters of phylogenetically related incident cases accounting for a high proportion of incident cases. [36 – 37] In addition to the limitations posed due to such 'seroguessing', serosorting has the disadvantage of not accounting for the presence of other STIs, leading in some cases to increases in their incidence and prevalence among communities where serosorting is a common practice. [38]

STI testing and treatment interventions

Sexually transmitted infections can have synergistic effect with HIV whereby the presence of another infection makes the transmission of HIV more likely. This means swift or delayed detection and treatment of other STIs among MSM (both HIV infected and HIV uninfected) impacts on HIV incidence. Integrating HIV and STI testing and treatment services provides opportunity to normalise HIV within sexual health services and can provide lower threshold access to testing—people can attend for reasons other than HIV and get an HIV test at the same time. Since HIV is a risk factor for other STIs (and vice versa), those attending for an HIV test disproportionately need to be screened for other infections. Integrated services also place the emphasis on the needs of the whole person, rather than the states need to track down HIV (or people with HIV).

Many Western Europe cities have STI treatment facilities able to provide non-judgemental services to MSM. Such facilities are far less available in the Centre and East. Consequently, MSM report reluctance to visit STI clinics and VCT centres, some experience mistreatment from staff when they become aware of their orientation. Non-disclosure of orientation to medical staff is one tactic to deal with this. [39] This results in inferior standards of care (especially in relation to rectal and oral STIs) and misattribution of HIV cases across exposure categories (hence the understatement of MSM in official HIV data). This lack of evidence of HIV transmission between MSM then perpetuates neglect of the provision of targeted prevention and treatment services.

Rectifying this situation can be done in two ways. In the short term service planners can set up MSM designated clinics, or directly advertise and promote general population clinics to MSM, ensuring and conveying that they are competent and non-judgemental. Over the longer term institutional homophobia needs to be tackled.

Designated gay men's services and interventions carried out in gay settings may disproportionately fail to reach men of lower socioeconomic status, men from minority cultures and male sex workers. [40] In homophobic environments, MSM will not want to be indentified attending MSM specific services. The focus should be on generic services that are able to respond adequately to the range of human sexuality and that respect the diverse ways in which sexual lives are organised. Such services will benefit all sections of the sexually active population. Further barriers exist for migrants who may have difficulties in accessing prevention services. In the former Soviet Union, HIV and STI treatment requires official residency; such a requirement excludes migrant MSM. [41] In migrant populations, the target group were often unaware of existing programs to serve their needs. Case study 4.9 below describes the issues around measuring coverage of interventions for MSM.

Case Study 4.9 Measuring coverage of interventions for MSM

EMIS 2010 used three criteria to create an indicator of coverage of prevention programmes: (1) not having engaged in unprotected anal intercourse in the last 12 months solely due to the lack of a condom; (2) having seen or heard MSM-specific information about HIV or STIs in the last 12 months, or having called a telephone helpline; and (3) if diagnosed HIV positive, having seen a doctor for medical monitoring in the last six months; or, if not HIV positive, being confident of being able to access an HIV test.

The five key UNGASS indicators [42] include the proportion of MSM who: have diagnosed HIV; used a condom the last time they had anal sex with a male partner; correctly identify ways of preventing the sexual transmission of HIV and reject major misconceptions about HIV transmission; received an HIV result in the past 12 months; were reached with HIV prevention programmes in the last 12 months; No analysis has been published as yet, however an analysis of the indicators for PWID suggest inconsistent reporting across countries. [43]

(continued next page)

Case Study 4.9 *(continued)*

The 2010 Dublin Declaration report on the progress of European countries in their HIV response summarises the UNGASS indicator data provided by the countries through the UNGASS reports. It should be noted that the problem of non-representative sampling in MSM research becomes acute in the case of intervention coverage. In many cases sampling was carried out in the same settings that interventions were delivered, giving a greatly inflated coverage figure. In addition, coverage was measured differently in most countries and can include encountering websites, peer education, counselling, or community press. We should therefore be extremely cautious about these data. The data suggest that the coverage of interventions in different countries is almost certainly uneven. [44]

Access to the internet

The settings in which MSM meet have long been used as places of contact for interventions and the internet is increasingly exploited as an HIV prevention interface. Like other populations, MSM use the internet for a wide variety of purposes, including to meet potential sexual partners. Internet access is not equally distributed across countries, or across demographic groups within countries. It is generally less accessible to many in the east of the region, especially in less affluent areas. However, access is only likely to grow in coming years.

MSM HIV prevention programmes need to go beyond gay-scene settings (bars, clubs, saunas, shops) to reach a significant and diverse proportion of the population. Websites for MSM are an essential part of HIV prevention programmes since they are used both by men who use gay-scene and those who do not. Educational mass media messaging targeting all sexually active men can also be designed to be of benefit to MSM through sensitive use of language and imagery. [41]

Community mobilisation

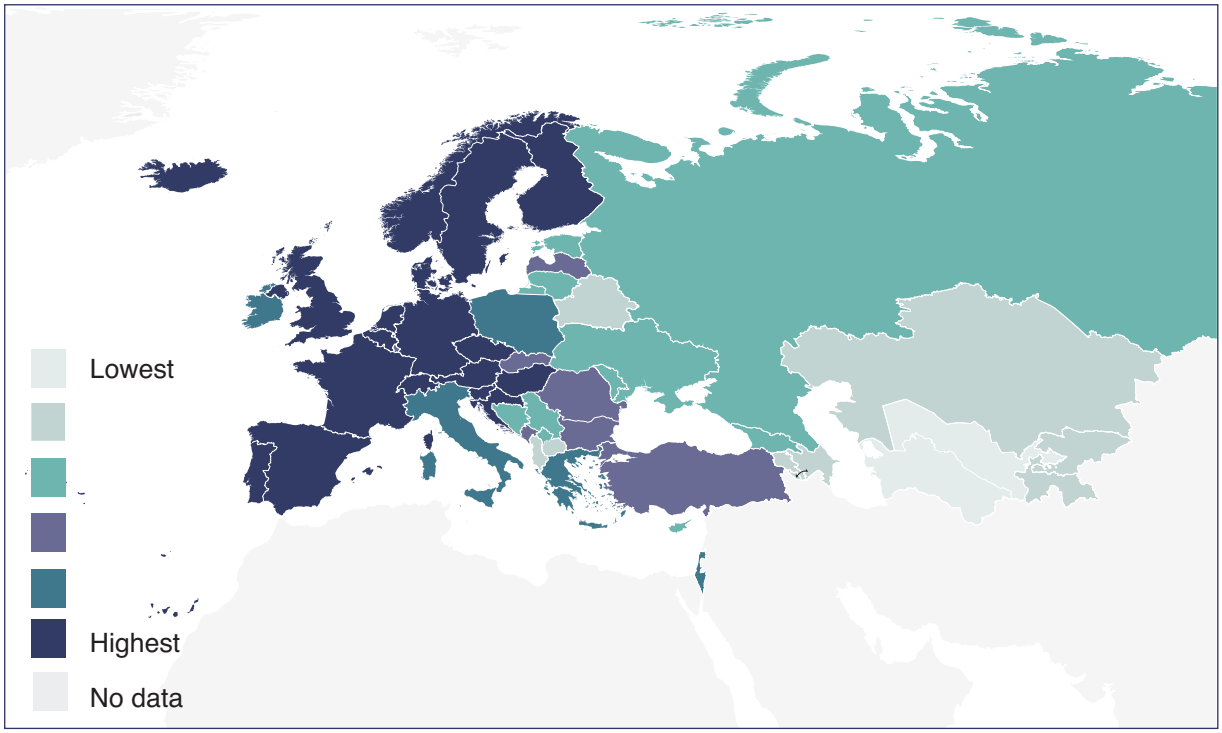
In the presence of widespread institutional homophobia (see also below), community mobilisation is a social intervention that has a long history in HIV prevention. [45] The driver for mobilisation can come from volunteer work within the community or externally through donors and agitators. Wright (2005) notes that mobilisation by MSM against HIV in Western Europe benefited from two elements largely historically absent in Eastern and Central Europe. [40] The first is the politicisation of MSM in the 1960s and 1970s around human rights causes and the consequent creation of an open gay community. This political mobilisation enabled a strategic response to the emergence of HIV in some Western communities. The second factor is the presence of long standing civil society networks that are relative absent of in most of the transition countries. Initiatives led by civil society agencies tend to have greater impact among people engaging in stigmatised behaviours than those led by government or other formal authorities. [40]

4.4.2 Policy environments mediating HIV prevention among MSM

The legal environment framing sex between men varies widely across the region. Figure 4.19 summarises an aggregated index of social-inclusivity to explore how the legislative and social environment in which MSM live differ across the region. The index includes the following indicators: (i) legislation against male-male sex; (ii) whether the legislation pre-dates 1981; (iii) legislation against discrimination on the grounds of sexual orientation; (iv) the presence of an annual Gay Pride activity; and (v) the recognition of civil partnership or marriage between people of the same gender.

Although a somewhat crude measure of the restrictiveness of environments in which MSM live, there is a clear pattern of increased restrictiveness in the East compared to the West. In part this is because membership of the European Union requires the repeal of anti-homosexuality legislation, and the Treaty of Amsterdam requires its member states to enact anti-discrimination legislation. [46] However, within the Europe region in only six countries (Spain, Sweden, Norway, the Netherlands, Belgium and the United Kingdom) are same sex partnership legally recognised. In Turkmenistan and Uzbekistan criminal codes state that sex between men is punishable by imprisonment of up to two and three years respectively

Figure 4.19 Legislative and social environments affecting MSM throughout Europe



Source: Aggregated index of social-inclusivity of MSM, based on literature review.
Notes: Index composed of five indicators: (i) legislation against male-male sex; (ii) whether the legislation pre-dates 1981; (iii) legislation against discrimination on the grounds of sexual orientation; (iv) the presence of an annual Gay Pride activity; and (v) the recognition of civil partnership or marriage between people of the same gender.

The legal situation facing MSM varies widely across the region. Although this is a very crude measure of the environments in which MSM live, there is a clear pattern of increased restrictiveness in the East compared to the West. 19 countries displayed every feature of an enabling environment that we used here (Austria, Belgium, Croatia, Czech Republic, Denmark, Finland, France, Germany, Hungary, Iceland, Luxembourg, the Netherlands, Norway, Portugal, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom). Turkmenistan and Uzbekistan score lowest on the index, neither displaying any features of an enabling policy environment and are the only two countries where sex between two consenting male adults remains illegal. In Turkmenistan and Uzbekistan criminal codes state that sex between men is punishable by imprisonment of up to two and three years respectively. However, only 26 of the 51 countries (51%) included in the index had such a law in place prior to 1981, the remaining 23 having made changes in the intervening years. In 33 countries (65%), discrimination on the grounds of sexual orientation is legislated against. In part this is because membership of the European Union requires the repeal of anti-homosexuality legislation, and the Treaty of Amsterdam requires its member states to enact anti-discrimination legislation. [46] An annual Gay Pride event is held in 37 of the 51 countries (73%). Within the Europe region only 21 countries (41%) recognise civil partnerships or same-sex marriages.

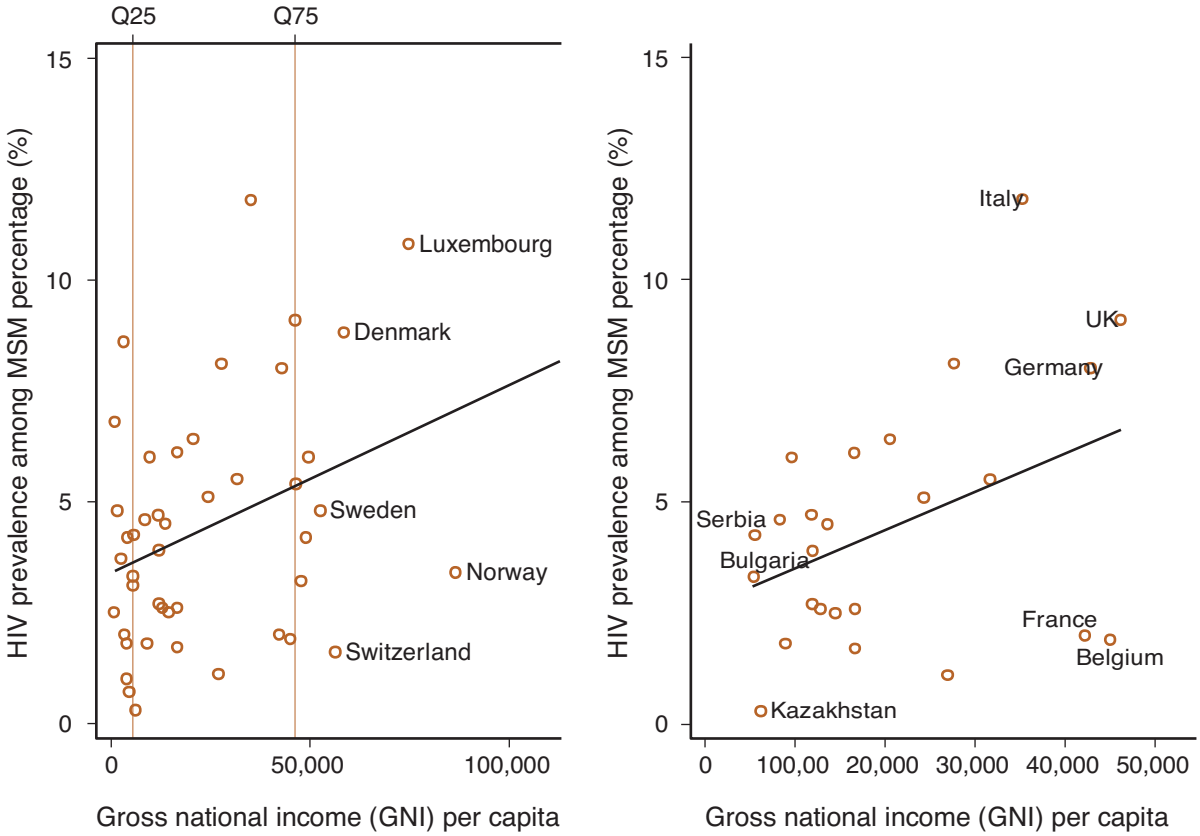
Legislative equality is an important step towards social inclusion. It also increases the validity of surveillance systems by reducing the need to suppress information on risk behaviours. Governments should act to: remove legal prohibitions on sex between MSM; set up a mechanism to prosecute police involved in harassment, assault or extortion of MSM; require police to enforce the laws against assault for MSM on equal terms with the rest of the population; provide legal recognition and protection of same sex relationships.

Supportive policy environments and HIV prevalence

Results from the systematic review and HIV case reports indicate that HIV prevalence among MSM is higher in countries in the West than East. Comparing these data alongside our policy index suggests that the more supportive the policy environment the higher the HIV prevalence. More supportive environments will lead to more openness in reporting sex with men as a risk factor in HIV case reports. This could also partly be explained by timing: liberalization of policies towards MSM may have occurred after increases HIV prevalence as well as the scale up of HIV interventions. Higher HIV prevalence may also be attributed to migration of MSM from countries with less supportive environments. A more supportive policy environment might lead to the increased availability of venues where gay men can meet and sex occurs increasing the chances of unprotected sex. Findings from the systematic review from studies in France and Switzerland suggest how a core group of HIV positive MSM engage in UAI. [31, 47] There is also evidence that other structural factors will interplay with the policy environment to mediate risk of HIV among MSM. When looking at the relationship between gross national income and HIV prevalence among MSM, for example, it is evident that prevalence increases along with gross national income per capita, with higher GNI in the West than East (Figure 4.20).

While more liberal policies might create environments in which HIV transmission can occur, less liberal policies may breach fundamental human rights conventions as well lead to adverse health outcomes. Evidence from the review suggests little regional difference in the numbers of sex partners reported in the East with more repressive environments, than Centre or West. Repressive polices do not support MSM in maintaining exclusive and cohabiting relationships. Instead, they encourage clandestine networks of casual sex partners that provide sexual relief but little of the social capital of regular partnerships. Paradoxically then, suppression fosters sexual partner turnover that carries risk but prevents supportive longer term relationships. Our systematic review noted that UAI was more frequently reported in samples in the East and condom use at last AI less frequently reported. [14] An example of the detrimental effects of homophobic policies in given in case study 4.10 below.

Figure 4.20 Relationship between HIV prevalence among MSM and GNI



Source: Appendices 3.A.21-23, GNI from World Development Indicators, World Bank

Violence against MSM

The systematic review identified the experience of internalised homophobia or feeling negative about one's sexuality to be associated with increased risk of UAI. Few studies in the review addressed homophobic violence but those that did suggest that verbal, physical and sexual attacks on the basis of sexual orientation are common. In the West, a Spanish study found that 10.7% of respondents had been the victim of aggression or verbal assaults in the past 12 months alone. [48] In the East, in Georgia, 21% of respondents reported ever having experienced physical violence, 14% verbal attacks and 7% sexual attacks including rape. [49] Personal homophobia among the social contacts of MSM (family, neighbours, social circles) has multiple negative effects on MSM. For example, in Georgia, stigma mitigates against the development of regular partnerships among men, who are afraid to meet a new partner again, in case others notice this new friendship. [12] In much of the region, hostile and exploitative police attitudes which effectively create impunity for sexual assault against MSM. [50 – 54]

Case Study 4.10 The impact of homophobic polices in the Russian Federation

Although homosexuality in the Russian Federation was decriminalised in 1993 with the fall of the Soviet Union, homophobic activities are widespread, with demonstrations to mark the decriminalisation of homosexuality frequently banned by city authorities and attempts to protest the ban met with physical violence from homophobic mobs and police. [55] Evidence suggests that policies in the Russian Federation towards MSM are becoming more repressive. In March 2012, the government put forward a homophobic bill banning 'propaganda of sodomy, lesbianism, bisexualism and transgenderism, and paedophilia to minors'. Passing of this bill would mean that fines could be imposed on people engaging in 'public activities to promote sodomy, lesbianism, bisexuality and transsexuality' that might be observed by minors. The vague terminology of the language could lead to a ban on wearing a gay-supportive logo or holding LGBT themed rallies in the city. Similar laws have been passed in other cities in the Russian Federation. The bill also links paedophilia and homosexuality further reinforcing homophobic sentiment in the society. The environment for LGBT is already hostile, and reports of activists being physically attacked are common. [56] There is little published about sexual identity in the Russian Federation, with little data on lifetime experience of same-sex activities. Evidence suggests that many gay men marry in order to conceal their identity The Russian LGBT Network and Helsinki Group have documented incidences of discrimination in relation to employment and well as restrictions to setting up NGOs to support LGBT groups. [57] While the HIV epidemic remains concentrated among PWID, it is likely that discrimination and stigma leads to major underreporting in HIV case reports and emerging evidence that HIV is growing among this population, but interventions and policies remain unsupportive to promote effective interventions.

Institutional homophobia

Institutional homophobia is the behaviour of organisations that is differentially detrimental to MSM independent of any of the individuals within it. While it is difficult for homophobes to act homophobically in non-homophobic institutions, homophobic institutions encourage everyone (including gay people) to act homophobically. One manifestation of institutional homophobia is workplace tolerance of hate-speech. A study in Northern Ireland of 752 LBGT people found that 31% of community and voluntary sector workers, 40% of public sector staff and 42.5% employed in the private sector said they had heard anti-gay remarks at work. Around a quarter reported hiding their sexuality at work. [58] Workplace conduct policy and the apparatus for its application determine how people behave at work.

Institutional homophobia manifests itself in different guises across the region. One manifestation of institutional homophobia is legal discrimination against MSM (and absence of protective legislation). [51] Eliminating unequal treatment in legislation and in law enforcement is essential to creating an environment in which MSM feel free to seek specific information about their HIV risks, community organisations can provide it without harassment.

References

[1] EuroHIV, Report on the EuroHIV 2006 survey on HIV and AIDS surveillance in the WHO European Region. 2007, Institut de veille sanitaire: Saint-Maurice.

[2] European Centre for Disease Prevention and Control/WHO Regional Office for Europe, HIV/AIDS surveillance in Europe 2009. 2010, European Centre for Disease Prevention and Control: Stockholm.

[3] European Centre for Disease Prevention and Control (ECDC), HIV testing: Increasing uptake and effectiveness in the European Union. 2010: Stockholm.

[4] Deblonde, J., et al., Barriers to HIV testing in Europe: a systematic review. *European Journal of Public Health,* 2010. 20(4): p. 422 – 32.

[5] Khotenashvili, L., S. Matic, and J.V. Lazarus, HIV testing and counselling policies and practices in Europe: lessons learned, ways forward. *HIV Medicine,* 2008. 9: p. 30 – 33.

[6] European Centre for Disease Prevention and Control, Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report. 2010, ECDC: Stockholm.

[7] Mounier-Jack, S., S. Nielsen, and R.J. Coker, HIV testing strategies across European countries. *HIV Medicine,* 2008. 9: p. 13 – 19.

[8] European Centre for Disease Prevention and Control (ECDC), Mapping of HIV/STI behavioural surveillance in Europe, in ECDC Technical Report. 2009: Stockholm.

[9] Garnett, G.P., et al., Behavioural data as an adjunct to HIV surveillance data.*Sexually Transmitted Infections,* 2006. 82 Suppl 1: p. i57 – 62.

[10] Gupta, G.R., et al., Structural approaches to HIV prevention. *The Lancet,* 2008. 372(9640): p. 764 – 75.

[11] Rehle, T., et al., Second -generation HIV surveillance: better data for decision-making. *Bulletin of the World Health Organization,* 2004. 82(2): p. 121 – 127.

[12] Sharma, M., D. Burrows, and R. Bluthenthal, Coverage of HIV prevention programmes for injection drug users: confusions, aspirations, definitions and ways forward. *International Journal of Drug Policy,* 2007. 18(2): p. 92 – 8.

[13] UNAIDS/WHO, Initiating second generation HIV surveillance systems: practical guidelines. 2002: Geneva, Switzerland.

[14] WHO, Introduction of second generation HIV surveillance guidelines in some newly independent states of Eastern Europe. 2001.

[15] Wiessing, L., Hedrich, D., Guarita, B., Donoghoe, M., Salminen, M., Griffiths, P., State of Second Generation HIV Surveillance for IDUs in Europe, in International Harm Reduction Conference 2010: Liverpool.

[16] Zaba, B., et al., The role of behavioral data in HIV surveillance. *AIDS,* 2005. 19(Supplement 2): p. S39 – S52.

[17] Des Jarlais, D.C., Dehne K, and J. Casbona, HIV Surveillance among injecting drug users. *AIDS,* 2001. 14(suppl 3): p. S13 – S22.

[18] Magnani, R., et al., Review of sampling hard-to-reach and hidden populations for HIV surveillance. *AIDS,* 2005. 19(Suppl 2): p. S67 – S72.

[19] Goel, S. and M.J. Salganik, Assessing respondent-driven sampling. Proceedings of the National Academy of Sciences

[20] U.S.A., 2010. 107(15): p. 6743 – 7.

[21] Heckathorn, D.D., et al., Extensions of Respondent Driven Sampling: A new approach to the study of injection drug users aged 18 – 25. *AIDS and Behaviour,* 2002. 6(1): p. 55 – 67.

[22] Johnston, L.G., et al., The effectiveness of respondent driven sampling for recruiting males who have sex with males in Dhaka, Bangladesh. *AIDS and Behavior* 2008. 12(2): p. 294 – 304.

[23] Simic, M., et al., Attempting respondent driven sampling in sex worker populations in Eastern Europe: emerging evidence and key issues for formative research. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2006.

[24] Salganik, M., J. and D.D. Heckathorn, Sampling and estimation in hidden populations using respondent-driven sampling. *Sociological Methodology,* 2004: p. 1 – 28.

[25] Diaz, T., et al., New strategies for HIV surveillance in resource-constrained settings: an overview. *AIDS,* 2005. 19(suppl 2): p. S1 – S8.

[26] Semaan, S., J. Lauby, and J. Liebman, Street and network sampling in evaluation studies of HIV risk-reduction interventions. *AIDS Reviews,* 2002. 4: p. 231 – 223.

[27] Platt, L., et al., Methodologies to recruit hard-to-reach groups in Russia and Estonia: Comparisons of two chain referral sampling methods across nine studies *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2006. 83(7): p. i39 – i53.

[28] Power, R., Some methodological and practical implications of employing drug users as indigenous field workers., in Challenge and Innovation: methodological advances in social research on HIV/AIDS, M. Boulton, Editor. 1994, Taylor and Francis: London. p. 97 – 111.

[29] Watters, J.K. and P. Biernacki, Targeted sampling: options for the study of hidden populations. *Social Problems,* 1989. 46: p. 416 – 430.

[30] European Centre for Disease Prevention and Control, Mapping of HIV/STI behavioural surveillance in Europe. 2009, European Centre for Disease Prevention and Control Stockholm.

[31] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2007. 2007, Saint-Maurice: Institut de Veille Sanitaire.

[32] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). European Monitoring Centre for Drugs and Drug Addiction (EMCDDA),. [cited; Available from: http://www.emcdda.europa.eu/.

[33] Fisher, M., et al., Serological testing algorithm shows rising HIV incidence in a United Kingdom cohort of men who have sex with men: 10 years application. *AIDS,* 2007. 21(17): p. 2309 – 2314 10.1097/QAD.0b013e3282ef9fed.

[34] Semaille C, C.F., Lot F, Pillonel J, Le Vu S, Le Strat Y, Bousquet V, Velter A, Barin F., Recently acquired HIV infection in men who have sex with men (MSM) in France, 2003 – 2008. *Eurosurveillance* , 2009. 14(48): p. 19425.

[35] Romero, A., et al., Recently acquired HIV infection in Spain (2003–2005): introduction of the serological testing algorithm for recent HIV seroconversion. *Sexually Transmitted Infections,* 2009. 85(2): p. 106 – 110.

[36] Remis, R.S., Reaching for the STARHS. *Sexually Transmitted Infections,* 2010. 86(7): p. 486 – 487.

[37] Mathers BM, D.L., Ali H, Wiessing L, Hickman M, Mattick RP, Myers B, Ambekar A, Strathdee SA, HIV prevention, treatment, and care services for people who inject drugs: a systematic review of global, regional, and national coverage. *The Lancet,* 2010. 375: p. 1014 – 1028.

[38] Mathers, B.M., et al., Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *The Lancet,* 2008. 372(9651): p. 1733 – 1745.

[39] Heimer, R., Community coverage and HIV prevention: Assessing metrics for estimating HIV incidence through syringe exchange. *International Journal of Drug Policy,* 2008. 19(Supplement 1): p. 65 – 73.

[40] Vickerman, P., et al., Model Projections on the Required Coverage of Syringe Distribution to Prevent HIV Epidemics Among Injecting Drug Users. *Journal of Acquired Immune Deficiency Syndromes,* 2006. 42(3): p. 355 – 361 10.1097/01.qai.0000219788.73539.47.

[41] Degenhardt L, M.B., Vickerman P, Rhodes T, Latkin C, Hickman M., Prevention of HIV infection for people who inject drugs: why individual, structural, and combination approaches are needed. *The Lancet*, 2010. 376: p. 285 – 301.

[42] Hickman, M., et al., Estimating drug prevalence: Review of methods with special reference to developing countries. *UN Bulletin on Narcotics*, 2002. LIV (1 and 2).

[43] Hickman, M., et al., Estimating the prevalence of problem drug use in inner London: a discussion of three capture-recapture studies. *Addiction,* 1999. 94(11): p. 1653 – 1662.

[44] Family Health International, Estimating the size of populations at risk for HIV: Issues and Methods. 2003, The UNAIDS/WHO Working Group on HIV/AIDS/STI Surveillance.

[45] Chapter 4.2

[46] Mathers BM, D.L., Ali H, Wiessing L, Hickman M, Mattick RP, Myers B, Ambekar A, Strathdee SA, HIV prevention, treatment, and care services for people who inject drugs: a systematic review of global, regional, and national coverage. *The Lancet*, 2010. 375: p. 1014 – 1028.

[47] Degenhardt L, M.B., Vickerman P, Rhodes T, Latkin C, Hickman M., Prevention of HIV infection for people who inject drugs: why individual, structural, and combination approaches are needed. *The Lancet,* 2010. 376: p. 285 – 301.

[48] Wolfe, D., M.P. Carrieri, and D. Shepard, Treatment and care for injecting drug users with HIV infection: a review of barriers and ways forward. *The Lancet*, 2010. 376(9738): p. 355 – 366.

[49] Room, R., The ambiguity of harm reduction—goal or means, and what constitutes harm?, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor 2010, Publications Office of the European Union: Luxembourg. p. 108.

[50] Strathdee, S.A., et al., HIV and risk environment for injecting drug users: the past, present, and future. The *Lancet,* 2010. 376(9737): p. 268 – 284.

[51] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Statistical bulletin 2011. 2011; Available from: http://www.emcdda.europa.eu/stats11.

[52] Van Den Berg, C., et al., Full participation in harm reduction programmes is associated with decreased risk for human immunodeficiency virus and hepatitis C virus: evidence from the Amsterdam Cohort Studies among drug users. *Addiction,* 2007. 102(9): p. 1454 – 1462.

[53] Grund, J.-P., Coffin, P., Jauffret-Roustide, M., Dijkstra, M.,de Bruin, D., Blanken, P., The fast and furious—cocaine, amphetamines and harm reduction, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor 2010, Publications Office of the European Union: Luxembourg. p. 191 – 232.

[54] Rhodes, T., Hedrich, D., Harm reduction and the mainstream, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor 2010, Publications Office of the European Union: Luxembourg. p. 462.

[55] World Health Organisation (WHO), WHO, UNODC, UNAIDS Technical Guide for countries to set targets for universal access to HIV prevention, treatment and care for injecting drug users, 2009.

[56] Kaplan, E.H. and R. Heimer, A Model-Based Estimate of HIV Infectivity via Needle Sharing. *Journal of Acquired Immune Deficiency Syndromes,* 1992. 5(11): p. 1116 – 1118.

[57] Tilson, H., Aramrattana, A., Bozzette, S., Preventing HIV infection among injecting drug users in high-risk countries: an assessment of the evidence. 2007, Washington, DC: Institute of Medicine.

[58] World Health Organisation (WHO), Consensus statement: addressing knowledge gaps in the public health approach to delivering antiretroviral therapy and care., Aug 4, 2008.

[59] Montaner, J.S.G., et al., The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic. *The Lancet,* 2006. 368(9534): p. 531 – 536.

[60] Palmateer, N., Kimber, J., Hickman, M., Hutchinson, S., Rhodes, T. and Goldberg, D., Evidence for the effectiveness of sterile injecting equipment provision in preventing hepatitis C and human immunodeficiency virus transmission among injecting drug users: a review of reviews. *Addiction,* 2010. 105: p. 844 – 859.

[61] Gibson, D.R., N.M. Flynn, and D. Perales, Effectiveness of syringe exchange programs in reducing HIV risk behavior and HIV seroconversion among injecting drug users. *AIDS,* 2001. 15(11): p. 1329 – 1341.

[62] Wodak, A., Cooney, A., Effectiveness of sterile needle and syringe programming in reducing HIV/AIDS among injecting drug users in World Health Organization Evidence for Action Technical Papers2004, World Health Organisation (WHO),: Geneva.

[63] Vickerman, P., et al., Model Projections on the Required Coverage of Syringe Distribution to Prevent HIV Epidemics Among Injecting Drug Users. *Journal of Acquired Immune Deficiency Syndromes,* 2006. 42(3): p. 355 – 361 10.1097/01.qai.0000219788.73539.47.

[64] Faggiano, F., Vigna-Taglianti, F., Versino, E., Lemma, P., Methadone maintenance at different dosages for opioid dependence. *Cochrane Database Systematic Reviews,* 2009. 3.

[65] Mattick, R.P., Breen, C., Kimber, J., Davoli, M., Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence. *Cochrane Database Syst Rev,* 2009. 3.

[66] Wong, K.-h., et al., Adherence to methadone is associated with a lower level of HIV-related risk behaviors in drug users. *Journal of Substance Abuse Treatment,* 2003. 24(3): p. 233 – 239.

[67] Hartel, D.M. and E.E. Schoenbaum, Methadone treatment protects against HIV infection: two decades of experience in the Bronx, New York City. Public health reports (Washington, D.C.: 1974), 1998. 113 Suppl 1: p. 107 – 15.

[68] Metzger, D.S., Human immunodeficiency virus seroconversion among intravenous drug users in- and out-of-treatment : an 18 – month prospective follow-up. *Journal of Acquired Immune Deficiency Syndrome,* 1993. 6(9): p. 1049 – 1056.

[69] Moss, A.R., et al., HIV seroconversion in intravenous drug users in San Francisco, 1985 – 1990. *AIDS,* 1994. 8(2): p. 223 – 232.

[70] Williams, A.B., et al., Methadone maintenance treatment and HIV type 1 seroconversion among injecting drug users. *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*, 1992. 4(1): p. 35 – 41.

[71] Rhoades, H.M., et al., Retention, HIV risk, and illicit drug use during treatment: methadone dose and visit frequency. *American Journal of Public Health,* 1998. 88(1): p. 34 – 39.

[72] Serpelloni, G., et al., Methadone treatment as a determinant of HIV risk reduction among injecting drug users: A nested case-control study. *AIDS Care: Psychological and Socio-medical Aspects of AIDS/HIV*, 1994. 6(2): p. 215 – 220.

[73] Novick, D.M., Joseph, H., Scott Croxson, T., Salsitz, E. A., Wang, G., Richman, B. L., Poretsky, L., Keefe, J. B., Whimbey, E., Absence of antibody to human immunodeficiency virus in long-term, socially rehabilitated methadone maintenance patients. Vol. 150. 1990, Chicago, IL, USA: American Medical Association.

[74] Sullivan, L.E., et al., Decreasing international HIV transmission: the role of expanding access to opioid agonist therapies for injection drug users. *Addiction,* 2005. 100(2): p. 150 – 158.

[75] Attia, S., et al., Sexual transmission of HIV according to viral load and antiretroviral therapy: systematic review and meta-analysis. *AIDS,* 2009. 23(11): p. 1397 – 1404 10.1097/QAD.0b013e32832b7dca.

[76] Quinn, T.C., Wawer, M. J., Sewankambo, N., Serwadda, D., Chuanjuan, Li, Wabwire-Mangen, F., Meehan, M. O., Lutalo, T., Gray, R. H., Viral load and heterosexual transmission of human immunodeficiency virus type 1. Vol. 342. 2000, Waltham, MA, USA: Massachusetts Medical Society.

[77] Wood, E., et al., Longitudinal community plasma HIV-1 RNA concentrations and incidence of HIV-1 among injecting drug users: prospective cohort study. *BMJ,* 2009. 338.

[78] Rhodes, T., et al., Policy resistance to harm reduction for drug users and potential effect of change. *BMJ,* 2010. 341.

[79] Elovich, R. and E. Drucker, On drug treatment and social control: Russian narcology's great leap backwards. *Harm Reduction Journal,* 2008. 5(1): p. 23.

[80] Babayan, E., Gonopolsky, M.H., Textbook on alcoholism and drug abuse in the Soviet Union. 1985: International Universities Press.

[81] Beyrer, C., Patel, Z., Stachowiak, J.A., Tishkova, F.K., Stibich, M.A., Eyzaguirre, L.M., Carr, J.K., Mogilnii, V., Peryshkina, A., Latypov, A., Strathdee, S.A., Characterization of the Emerging HIV Type 1 and HCV Epidemics among Injecting Drug Users in Dushanbe, Tajikistan. *AIDS Research and Human Retroviruses,* 2009. 25(9): p. 853 – 860.

[82] Deryabina, A., Hausner, D.S., Aubakirova, B., Ashimova, S., Kudussova, Y., Musaeva, Z., Nazarova, R., Khodakevich, L., High coverage of injecting drug users (IDUs) with comprehensive HIV prevention services reduces HIV risk in Central Asia, in XVIII International AIDS Conference 2010: Vienna, Austria.

[83] Malta, M., et al., Adherence to Antiretroviral Therapy Among HIV-Infected Drug Users: A Meta-Analysis. *AIDS and Behavior,* 2010. 14(4): p. 731 – 747.

[84] Palepu, A., et al., Antiretroviral adherence and HIV treatment outcomes among HIV/HCV co-infected injection drug users: The role of methadone maintenance therapy. *Drug and alcohol dependence,* 2006. 84(2): p. 188 – 194.

[85] Lert, F. and M.D. Kazatchkine, Antiretroviral HIV treatment and care for injecting drug users: An evidence-based overview. *International Journal of Drug Policy,* 2007. 18(4): p. 255 – 261.

[86] Hedrich, D., A. Pirona, and L. Wiessing, From margin to mainstream: The evolution of harm reduction responses to problem drug use in Europe. *Drugs: Education, Prevention, and Policy,* 2008. 15(6): p. 503 – 517.

[87] Sylla, L., et al., Integration and co-location of HIV/AIDS, tuberculosis and drug treatment services. *International Journal of Drug Policy,* 2007. 18(4): p. 306 – 312.

[88] World Health Organisation (WHO), Policy guidelines for collaborative TB and HIV services for injecting and other drug users: an integrated approach, in Evidence for action technical papers 2008.

[89] Vlasenko, L., Gumeniuk, O., Dubovik, V., Lisnycha, O., Solonskiy, v., Osypova, S., Grishayeva, I., Methadone based integrated care for IDUs in Dnipropetrovsk region of Ukraine, in XVIII International AIDS Conference 2010: Vienna, Austria.

[90] Wiessing, L., et al., Associations Between Availability and Coverage of HIV-Prevention Measures and Subsequent Incidence of Diagnosed HIV Infection Among Injection Drug Users. *American Journal of Public Health,* 2009. 99(6): p. 1049 – 1052.

[91] Heimer, R., Community coverage and HIV prevention: Assessing metrics for estimating HIV incidence through syringe exchange. *International Journal of Drug Policy,* 2008. 19 (Supplement 1): p. 65 – 73.

[92] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). Statistical bulletin 2010. 2010; Available from: http://www.emcdda.europa.eu/stats10.

[93] Sarang, A., T. Rhodes, and L. Platt, Access to syringes in three Russian cities: Implications for syringe distribution and coverage. *International Journal of Drug Policy,* 2008. 19(Supplement 1): p. 25 – 36.

[94] Booth, R., Dvoryak, S., Anderson, C., John, B., Strathdee, S., Police brutality is independently associated with sharing injection equipment among injection drug users in Odessa, Ukraine, in XVIII International AIDS Conference 2010: Vienna, Austria.

[95] Spicer, N., et al., 'It's risky to walk in the city with syringes': understanding access to HIV/AIDS services for injecting drug users in the former Soviet Union countries of Ukraine and Kyrgyzstan. *Globalization and Health,* 2011. 7(22): p. (13 July 2011).

[96] Mathers, B.M., et al., Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *The Lancet,* 2008. 372(9651): p. 1733 – 1745.

[97] Skala, P., Criminalization of drug users in Ukraine as a factor hindering the scale up of access to HIV/AIDS prevention and treatment programmes, in XVIII International AIDS Conference 2010: Vienna, Austria.

[98] Bobrova, N., et al., Barriers to accessing drug treatment in Russia: a qualitative study among injecting drug users in two cities. *Drug and alcohol dependence,* 2006. 82: p. S57 – S63.

[99] Russian Federation Federal Service for Surveillance of Consumer Rights Protection and Human Well-Being, Country Report of the Russian Federation on the Implentation of the Declaration of Committment on HIV/AIDS, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010: Moscow.

[100] Cook, C., Bridge, J., Stimson, G. V., The diffusion of harm reduction in Europe and beyond, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor 2010, Publications Office of the European Union: Luxembourg. p. 462.

[101] Judice, N., O. Zaglada, and R. Mbuya-Brown, HIV Policy Assessment: Ukraine, 2011, Futures Group, Health Policy Project.: Washington, DC.

[102] European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), Annual report 2011: the state of the drugs problem in Europe, 2011: Luxembourg.

[103] Donoghoe, M.C., Stengaard, A.R., Access to antiretroviral therapy (ART) for injecting drug users in the WHO European Region 2002 – 2008, in XVIII International AIDS Conference 2010: Vienna, Austria.

[104] Lambers, F., Stolte, I., van den Berg, C., Coutinho, R., Prins, M., Harm reduction intensity—its role in HAART adherence among drug users in Amsterdam, in XVIII International AIDS Conference 2010: Vienna, Austria.

[105] Mathers, B.M., et al., HIV prevention, treatment, and care services for people who inject drugs: a systematic review of global, regional, and national coverage. *The Lancet,* 2010. 375(9719): p. 1014 – 28.

[106] Uuskula, A., et al., Expanded syringe exchange programs and reduced HIV infection among new injection drug users in Tallinn, Estonia. *BMC Public Health,* 2011. 11: p. 517.

[107] Ulugbek Aminov, H.P.M., UNDP Tajikistan, Personal communication, E. Jolley, Editor 2012.

[108] Camoni, L., et al., Prevalence and correlates of infection with human immunodeficiency virus, hepatitis B virus, and hepatitis C virus among drug users in Italy: A cross-sectional study. *Scandinavian Journal of Infectious Diseases*, 2009. 41(6 – 7): p. 520 – 523.

[109] Smolskaya, T.T., Yakovleva, A.A., Kasumov, V.K., Gheorgitsa, S.I. , HIV Sentinel Surveillance in High-Risk Groups in Azerbaijan, Republic of Moldova and in the Russian Federation, 2004, World Health Organisation (WHO), Europe.

[110] Expanding Network for Comprehensive and Coordinated Action on HIV/AIDS prevention among IDUs and Bridging Population (ENCAP), *Prevalence of HIV and other infections and risk behaviour among Injecting Drug Users in Latvia, Lithuania and Estonia in 2007,* 2009.

[111] UNGASS Country Progress Report: Romania, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[112] UNGASS, UNGASS Country Progress Report: Republic of Serbia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[113] UNGASS, UNGASS Country Progress Report: Republic of Macedonia, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[114] UNGASS, Country Progress Report on Monitoring the Declaration of Committment on HIV/AIDS: Republic of Bulgaria, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[115] UNGASS, UNGASS Country Progress Report: Bosnia and Herzegovina, United Nations General Assembly Special Session on HIV/AIDS, Editor 2010.

[116] Family Health International (FHI), Albania—Behavioral and Biological Surveillance Study Report, 2006.

[117] National AIDS Program, I.o.P.H., Albania, UNGASS 2010 Country Progress Report, Albania, 2010: Tirana.

[118] The Ministry of Health and Social Welfare, R.o.C., UNGASS 2010 Country Progress Report Croatia, 2010.

[119] Soliev, A., Analysis on epidemiological situation and responses based on second generation sentinel surveillance system among injecting drug users, Tajikistan, Kazakhstan, Kyrgyzstan, 2006 – 2009, 2010.

[120] Sanchez JL, T.C., Bautista CT, Botros BA, Khakimov MM, Giyasova GM, Yakubov SK, Abdulaeva MA, Saad MD, Graham RR, Carr JK, Earhart KC., High HIV prevalence and risk factors among injection drug users in Tashkent, Uzbekistan, 2003 – 2004. *Drug and Alcohol Dependence,* 2006. 82: p. S15 – S22.

[121] Mounier-Jack, S., S. Nielsen, and R.J. Coker, HIV testing strategies across European countries. *HIV Medicine,* 2008. 9: p. 13 – 19.

[122] Samet, J.H., Russia and human immunodeficiency virus—beyond crime and punishment. *Addiction,* 2011. 106(11): p. 1883 – 5.

[123] Platt, L., et al., Impact of Gender and Sex Work on Sexual and Injecting Risk Behaviors and Their Association With HIV Positivity Among Injecting Drug Users in an HIV Epidemic in Togliatti City, Russian Federation. *Sexually Transmitted Diseases,* 2005. 32(10): p. 605 – 612.

[124] Busza, J.R., et al., Street-based adolescents at high risk of HIV in Ukraine. *Journal of Epidemiology and Community Health,* 2010.

[125] Sakovych, O., Balakireva, O., Ancker, S., Service access barriers in Ukraine seen through the eyes of adolescent injecting drug users and female sex workers—using the results of a qualitative study in the design of targeted HIV prevention interventions, in XVIII International AIDS Conference 2010: Vienna, Austria.

[126] International Harm Reduction Development Program, The Effects of Drug User Registration Laws on People's Rights and Health: Key Findings from Russia, Georgia, and Ukraine, in Assessment in Action Series 2009, Open Society Institute: New York.

[127] Blankenship, K., et al., Structural Interventions: Concepts, Challenges and Opportunities for Research. *Journal of Urban Health,* 2006. 83(1): p. 59 – 72.

[128] Gupta, G.R., et al., Structural approaches to HIV prevention. *The Lancet,* 2008. 372(9640): p. 764 – 75.

[129] Rhodes, T. and M. Simic, Transition and the HIV risk environment. *BMJ,* 2005. 331(7510): p. 220 – 223.

[130] World Health Organisation (WHO), Policy and Programming Guide for HIV/ AIDS Prevention and Care among Injecting Drug Users, 2005.

[131] Beyrer, C., et al., Time to act: a call for comprehensive responses to HIV in people who use drugs. *The Lancet,* 2010. 376(9740): p. 551 – 563.

[132] Wood, E., et al., The war on drugs: a devastating public-policy disaster. *The Lancet,* 2009. 373(9668): p. 989 – 90.

[133] Joint United Nations Program on AIDS (UNAIDS), International Guidelines on HIV/AIDS and Human Rights: 2006 Consolidated Version, 2006.

[134] Hoover, J., Jürgens, R., Harm Reduction in Prison: The Moldova Model, R. Saucier, Shkurpela, D., Silva, P., Editor 2009, International Harm Reduction Development Program, Open Society Institute Public Health Program.

[135] European Centre for Disease Prevention and Control, Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report, 2010, ECDC: Stockholm.

[136] Walmsley, R., World Prison Population List (7th edition), 2009, International Centre for Prison Studies.

[137] United Nations Office on Drugs and Crime (UNODC), R.O.f.C.A., Canadian HIV/AIDS Legal Network, Accessibility of HIV Prevention, Treatment and Care Services for People who Use Drugs and Incarcerated People in Azerbaijan, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan: Legislative and Policy Analysis and Recommendations for Reform, 2010, United Nations Office on Drugs and Crime, Regional Office for Central Asia: Ashgabat.

[138] Human Rights Watch, Fanning the Flames: How human rights abuses are fueling the AIDS epidemic in Kazakhstan, 2003.

[139] Sarang, A., et al., Policing Drug Users in Russia: Risk, Fear, and Structural Violence. *Substance Use & Misuse,* 2010. 45(6): p. 813 – 864.

[140] Dzhalbieva, I., Ermolaeva, I., Tokombaeva, M., The limitation of services and psycho-psychological factors influencing the spread of HIV among female IDUs in the southern region of Kyrgyzstan. *Report on research results*., 2009, Public Foundation "Asteria": Bishkek.

[141] Lewis, D., High Times on the Silk Road: The Central Asian Paradox. *World Policy Journal*, 2010. 27(1): p. 39 – 49.

[142] The Government of Tajikistan, Programme for countering HIV/AIDS epidemic in the Republic of Tajikistan for the period 2007 – 2010, 2007.

[143] Latypov, A., Drug dealers, drug lords and drug warriors-cum-traffickers: Drug crime and the narcotics market in Tajikistan, 2011, Eurasian Harm Reduction Network: Vilnius.

[144] AIDSMark regional lessons learned. Eastern Europe. USAID Award No. HRN-A-00 – 97 – 00021 – 002007: Washington, D.C., PSI, AIDSMark, 2007. [4].

[145] Portuguese Government, Portuguese National Strategy for the Fight Against Drugs, 1999.

[146] Greenwald, G., Drug Decriminalization in Portugal: Lessons for Creating Fair and Successful Drug Policies, 2009, The Cato Institute.

[147] Degenhardt, L., et al., Toward a Global View of Alcohol, Tobacco, Cannabis, and Cocaine Use: Findings from the WHO World Mental Health Surveys. *PLoS Med,* 2008. 5(7): p. e141.

[148] European Centre for Disease Prevention and Control/WHO Regional Office for Europe, HIV/AIDS surveillance in Europe 2010, 2011, European Centre for Disease Prevention and Control: Stockholm.

[149] In Russia, stigma and discrimination add to the burden of HIV-positive mothers and children. *Connections*, 2005: p. [2].

[150] Instituto da Droga e da Toxicodependência de Portugal (Institute on Drugs and Drug Addiction of Portugal), The National Situation relating to Drugs and Dependency, 2006 Annual Report 2007.

[151] Pinto Coelho, M., The 'resounding success' of Portuguese drug policy: the power of an attractive fallacy., 2010, Association for a Drug Free Portugal: Lisboa.

[152] Hughes, C.E. and A. Stevens, A resounding success or a disastrous failure: Re-examining the interpretation of evidence on the Portuguese decriminalisation of illicit drugs. *Drug and Alcohol Review,* 2012. 31(1): p. 101 – 113.

[153] Artur Domosławski, Drug Policy in Portugal: The Benefits of Decriminalizing Drug Use, in Lessons for Drug Policy 2011, Open Society Foundations.

[154] Chapter 4.3

[155] Shahmanesh, M., et al., Effectiveness of interventions for the prevention of HIV and other sexually transmitted infections in female sex workers in resource poor setting: a systematic review. *Tropical Medicine & International Health*, 2008. 13(5): p. 659 – 79.

[156] WHO, Monitoring and reporting on the health sector response to HIV/AIDS towards Universal Access, WHO, Editor. 2009, WHO, UNICEF, UNAIDS.

[157] Mathers, B.M., et al., Estimating the level of HIV prevention coverage, knowledge and protective behavior among injecting drug users: what does the 2008 UNGASS reporting round tell us? *Journal of Acquired Immune Deficiency Syndrome,* 2009. 52 Suppl 2: p. S132 – 42.

[158] Crago, A.L., Arrest the violence. Human Rights abuses against sex workers in Central and Eastern Europe and Central Asia. 2009, Sex Workers' Rights Advocacy Network in Central and Eastern Europe and Central Asia.

[159] King, E., V. Dudina, and S. Maman, Understanding decisions to test for HIV among female sex workers in St. Petersburg, Russia, in XVIII International AIDS Conference 2010: Vienna, Austria.

[160] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working sex workers in London: the effect of migration from Eastern Europe. In press, 2011.

[161] van Veen, M.G., et al., HIV and Sexual Risk Behavior among Commercial Sex Workers in the Netherlands. *Archives of Sexual Behavior,* 2010. 39(3): p. 714 – 723.

[162] Todd, C.S., et al., Prevalence and correlates of condom use and HIV testing among female sex workers in Tashkent, Uzbekistan: Implications for HIV transmission. *AIDS and Behavior,* 2007. 11(3): p. 435 – 442.

[163] Country Coordination Committee, R.o.K., UNGASS 2010 Country Progress Report, Republic of Kazakhstan. 2010: Almaty.

[164] Stulhofer, A., et al., Female sex work and HIV risks in Croatia. *AIDS Care*-Psychological and Socio-Medical Aspects of AIDS/Hiv, 2009. 21(11): p. 1439 – 1446.

[165] UNFPA and UNICEF, Consultation on strategic information and HIV prevention among most-at-risk adolescents: Research Tool-kit. 2009.

[166] UNGASS Country Progress Report: Bosnia and Herzegovina, United Nations General Assembly Special Session on HIV/AIDS, Editor. 2010.

[167] Family Health International, 2006 Behavioural and Biological Surveillance Study Kosova, in Impact: Implementing AIDS Preventing and Care Project. 2007, Family Health International.

[168] International Harm Reduction Development Program, Women, Harm Reduction, and HIV, in Assessment in Action. 2009, Open Society Institute.

[169] Surratt, H.L. and J.A. Inciardi, An effective HIV risk-reduction protocol for drug-using female sex workers.Journal of Prevention & Intervention in the Community, 2010. 38(2): p. 118 – 31.

[170] Sex work, HIV / *AIDS,* and human rights in Central and Eastern Europe and Central Asia. A report from the Central and Eastern European Harm Reduction Network. 2005: Vilnius, Lithuania, CEEHRN, 2005 Jul. 119.

[171] Church, S., et al., Violence by clients towards female prostitutes in different work setting: questionnaire survey. *BMJ,* 2001. 322: p. 524 – 525.

[172] Tampep and L. Brussa, Sex Work In Europe: A mapping of the prostitution scene in 25 countries, in Sex Work, Migration and Health, T. International, Editor. 2009, Tampep International: Amsterdam.

[173] Sanders, T. and R. Campbell, Designing out vulnerability, building in respect: violence, safety and sex work policy. *British Journal of Sociology,* 2007. 58(1): p. 1 – 19.

[174] Bellis, M.A., et al., Comparative views of the public, sex workers, businesses and residents on establishing managed zones for prostitution: analysis of a consultation in Liverpool. *Health Place*, 2007. 13(3): p. 603 – 16.

[175] Oberzaucher, N., HIV and sexually transmitted infection prevention among sex workers in Eastern Europe and Central Asia. UNAIDS Best Practice Collection;UNAIDS/06.10E. 2006, Geneva, Switzerland: Joint United Nations Programme on HIV / AIDS [UNAIDS], 2006 May. 63.

[176] Aral, S., O., et al., The social organization of commercial sex work in Moscow, Russia. *Sexually Transmitted Diseases,* 2003. 30(1): p. 39 – 45.

[177] Strathdee, S., Health risks and power among female sex workers in Moscow, S. report, Editor. 2005.

[178] Aral, S.O., J.S. St. Lawrence, and A. Uuskula, Sex work in Tallinn, Estonia: The sociospatial penetration of sex work into society. *Sexually Transmitted Infections,* 2006. 82(5): p. 348 – 353.

[179] International AIDS Alliance, Behavioural monitoring and HIV infection prevalence among female sex workers as a component of second generation surveillance. 2009, International AIDS Alliance: Kiev.

[180] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe.*Sexually Transmitted Infections,* 2011.

[181] Rou, K., et al., A five-city trial of a behavioural intervention to reduce sexually transmitted disease/HIV risk among sex workers in China. *AIDS,* 2007. 21 Suppl 8: p. S95 – 101.

[182] Wendell, D.A., et al., Street outreach for HIV prevention: effectiveness of a state-wide programme. *International Journal of STD & AIDS,* 2003. 14(5): p. 334 – 40.

[183] TAMPEP, Work Safe in Sex Work. A European Manual on Good Practices in Work With and For Sex Workers, in TAMPEP 8, V. Munk, Editor. 2009, European Network for HIV/STI Prevention and Health Promotion among Migrant Sex Workers: The Netherlands.

[184] Diserens, E.A., et al., Clients of sex workers in Switzerland: it makes sense to counsel and propose rapid test for HIV on the street, a preliminary report. *BMC Infectious Diseases,* 2010. 10: p. 74.

[185] Janssen, P.A., et al., Peer support using a mobile access van promotes safety and harm reduction strategies among sex trade workers in Vancouver's Downtown Eastside. *Journal of Urban Health,* 2009. 86(5): p. 804 – 9.

[186] Luchters, S., et al., Impact of five years of peer-mediated interventions on sexual behavior and sexually transmitted infections among female sex workers in Mombasa, Kenya. *BMC Public Health,* 2008. 8(1): p. 143.

[187] Ziersch, A., J. Gaffney, and D.R. Tomlinson, STI prevention and the male sex industry in London: evaluating a pilot peer education programme. *Sexually Transmitted Infections,* 2000. 76(6): p. 447 – 453.

[188] Ford, K., et al., Evaluation of a peer education programme for female sex workers in Bali, Indonesia. *International Journal of STD & AIDS,* 2000. 11(11): p. 731 – 3.

[189] Luchters, S., et al., Impact of five years of peer-mediated interventions on sexual behavior and sexually transmitted infections among female sex workers in Mombasa, Kenya. *BMC Public Health,* 2008. 8: p. 143.

[190] Aklilu, M., et al., Factors associated with HIV-1 infection among sex workers of Addis Ababa, Ethiopia. *AIDS,* 2001. 15(1): p. 87 – 96.

[191] Cooper, K., et al., Maids, Migrants and Occupational Health in the London Sex Industry. Anthropology & Medicine, 2007. 14(1): p. 41 – 53.

[192] Grenfell, P., et al. Eastern European women selling sex in London: social networks, agency and risk. in International Conference on the Reduction of Drug Related Harm. 2009. Bangkok.

[193] Chimienti, M., Selling Sex in Order to Migrate: The End of the Migratory Dream? *Journal of Ethnic and Migration Studies,* 2010. 36(1): p. 27 – 45.

[194] Simic, M., et al., Attempting respondent driven sampling in sex worker populations in Eastern Europe: emerging evidence and key issues for formative research. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2006.

[195] Kinnell, H., Violence and Sex Work in Britain. 2008, Cullompton: Willan Publishing. 290.

[196] Harcourt, C., S. Egger, and B. Donovan, Sex work and the law. *Sex Health,* 2005. 2(3): p. 121 – 8.

[197] Thomas, R.M., et al., Female migrant sex workers: at risk in Europe. HIV/AIDS in Europe: moving from death sentence to chronic disease management, ed. S. Matic, J.V. Lazarus, and M.C. Donoghoe. 2006, Geneva: World Health Organisation

[198] International Committee on the Rights of Sex Workers in Europe, The Declaration on the rights of Sex Workers in Europe, in European Conference on Sex Work, Human Rights, Labour and Migration. 2005: Brussels, Belgium.

[199] Samaranayake, A., et al., Legislation requiring monthly testing of sex workers with low rates of sexually transmitted infections restricts access to services for higher-risk individuals.*Sexually Transmitted Infections,* 2009. 85(7): p. 540 – 2.

[200] Sirotin, N., et al., Effects of government registration on unprotected sex amongst female sex workers in Tijuana; Mexico. *International Journal of Drug Policy,* 2010. 21(6): p. 466 – 70.

[201] Sirotin, N., et al., A comparison of registered and unregistered female sex workers in Tijuana, Mexico. *Public Health Reports,* 2010. 125 Suppl 4: p. 101 – 9.

[202] Rekart, M.L., Sex-work harm reduction. *The Lancet,* 2005. 366: p. 2123 – 2134.

[203] Goodyear, M.D. and L. Cusick, Protection of sex workers. *BMJ,* 2007. 334(7584): p. 52 – 3.

[204] Central and Eastern European Harm Reduction Network, Sex work, HIV / *AIDS,* and human rights in Central and Eastern Europe and Central Asia. A report from the Central and Eastern European Harm Reduction Network. 2005: Vilnius, Lithuania, CEEHRN, 2005 Jul. 119.

[205] Cwikel, J.G., et al., Sexually transmissible infections among illegal female sex workers in Israel. *Sexual Health,* 2006. 3(4): p. 301 – 303.

[206] Gjenero-Margan, I., Kolari, B., Epidemiology of HIV Infection and AIDS in Croatia – An Overview. *Collegium Antropologicum*, 2006: p. 11 – 16.

[207] Aral, S.O., et al., Commercial sex work, drug use, and sexually transmitted infections in St. Petersburg, Russia. *Social Science and Medicine,* 2005. 60: p. 2181 – 2190.

[208] Rhodes, T., et al., Police violence and sexual risk among female and transvestite sex workers in Serbia: qualitative study. *BMJ,* 2008. 337(7669).

[209] Crago, A.L., et al., Central & Eastern Europe and Central Asia: police raids and violence put sex workers at risk of HIV. HIV/AIDS Policy & Law Review / *Canadian HIV/AIDS Legal Network*, 2008. 13(2 – 3): p. 71 – 2.

[210] Simic, M. and T. Rhodes, Violence, dignity and HIV vulnerability: street sex work in Serbia. *Sociology of Health & Illness,* 2009. 31(1): p. 1 – 16.

[211] UNAIDS Advisory Group on HIV and Sex Work, The report of the UNAIDS Advisory Group on HIV and Sex Work. 2011, UNAIDS.

[212] Campbell, R. and M. Storr, Challengeing the Kerb Crawler Rehabilitation Programme. Feminist Review, 2001. 67: p. 94 – 108.

[213] Seib, C., J. Fischer, and J.M. Najman, The health of female sex workers from three industry sectors in Queensland, *Australia. Social Science & Medicine,* 2009. 68(3): p. 473 – 478.

[214] Boyle, F.M., et al., Psychological distress among female sex workers. *Australian and New Zealand Journal of Public Health,* 1997. 21(6): p. 643 – 646.

[215] Romans, S.E., et al., The mental and physical health of female sex workers: a comparative study. *Australian and New Zealand Journal of Psychiatry,* 2001. 35(1): p. 75 – 80.

[216] Boynton, P. and L. Cusick, Sex workers to pay the price. *BMJ,* 2006. 332(7535): p. 190 – 1.

[217] Cusick, L., et al., Wild guesses and conflated meanings? Estimating the size of the sex worker population in Britan. *Critical Social Policy*, 2009. 29: p. 703 – 719.

[218] Shannon, K., et al., Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ,* 2009. 339: p. b2939.

[219] Platt, L., et al., Effects of sex work on the prevalence of syphilis among injection drug users in 3 Russian cities. *American Journal of Public Health,* 2007. 97(3): p. 478 – 485.

[220] Walmsley, R., World Prison Population List (7th edition). 2009, International Centre for Prison Studies.

[221] Pal, D., D.K. Raut, and A. Das, A study of HIV/STD infections amongst commercial sex workers in Kolkata (India). Part-I: some socio-demographic features of commercial sex workers. *Journal of Communicable Diseases,* 2003. 35(2): p. 90 – 5.

[222] Basu, I., et al., HIV prevention among sex workers in India. *Journal of Acquired Immune Deficiency Syndromes,* 2004. 36(3): p. 845 – 52.

[223] Williams, J.R., et al., What is the achievable effectiveness of the India AIDS Initiative intervention among female sex workers under target coverage? Model projections from southern India.*Sexually Transmitted Infections,* 2006. 82(5): p. 372 – 80.

[224] Pickles, M., et al., Interim modelling analysis to validate reported increases in condom use and assess HIV infections averted among female sex workers and clients in southern India following a targeted HIV prevention programme.*Sexually Transmitted Infections,* 2010. 86 Suppl 1: p. i33 – 43.

[225] Chandrashekar, S., et al., The effects of scale on the costs of targeted HIV prevention interventions among female and male sex workers, men who have sex with men and transgenders in India.*Sexually Transmitted Infections,* 2010. 86 Suppl 1: p. i89 – 94.

[226] Swendeman, D., et al., Empowering sex workers in India to reduce vulnerability to HIV and sexually transmitted diseases. *Social Science & Medicine,* 2009. 69(8): p. 1157 – 66.

[227] Blankenship, K.M., et al., Power, community mobilization, and condom use practices among female sex workers in Andhra Pradesh, India. *AIDS,* 2008. 22 Suppl 5: p. S109 – 16.

[228] Celentano, D.D., et al., HIV-1 infection among lower class commercial sex workers in Chiang Mai, Thailand. *AIDS,* 1994. 8(4): p. 533 – 7.

[229] Kerrigan, D., et al., Environmental-structural factors significantly associated with consistent condom use among female sex workers in the Dominican Republic. *AIDS,* 2003. 17(3): p. 415 – 23.

[230] Sherman, S.G., et al., The evaluation of the JEWEL project: an innovative economic enhancement and HIV prevention intervention study targeting drug using women involved in prostitution. *AIDS Care,* 2006. 18(1): p. 1 – 11.

[231] Aidala, A., et al., Housing status and HIV risk behaviors: implications for prevention and policy. *AIDS and Behavior* 2005. 9(3): p. 251 – 65.

[232] Gupta, G.R., et al., Structural approaches to HIV prevention. *The Lancet,* 2008. 372(9640): p. 764 – 75.

[233] Galea, S., C. Hall, and G.A. Kaplan, Social epidemiology and complex system dynamic modelling as applied to health behaviour and drug use research. *International Journal of Drug Policy,* 2009. 20(3): p. 209 – 16.

[234] UNAIDS, World AIDS Day Report. 2011, Joint United Nations Programme on HIV/AIDS: Geneva.

[235] UNAIDS, UNAIDS Guidance Note on HIV and Sex Work. 2009, Joint United Nations Programme on HIV/AIDS: Geneva.

[236] Chapter 4.4

[237] Johnson, W.D., et al., Behavioral interventions to reduce risk for sexual transmission of HIV among men who have sex with men. *Cochrane Database Syst Rev,* 2008(3): p. CD001230.

[238] Rees, R., Kavanagh, J., Burchett, H., Shepher, J., Brunton, G., Harden, A., Thomas, J., Oliver, S., Oaskley, A., HIV Health Promotion and Men who have Sex with Men (MSM): A systematic review of research relevant to the development and implementation of effective and appropriate interventions. 2004, EPPI-Centre, Social Science Research Unit, Institute of Education, University of London London.

[239] Csepe, P., et al., HIV risk behaviour among gay and bisexual men in Budapest, Hungary. *International Journal of STD & AIDS,* 2002. 13(3): p. 192 – 200.

[240] Kasianczuk, M.G., et al., Risk Factors Associated with Condom Use Among Men Who Have Sex with Men in Ukraine. *Journal of LGBT Health Research,* 2009. 5(1 – 2): p. 51 – 62.

[241] Štulhofer, A., et al., HIV-related Sexual Risk Taking Among HIV-negative Men Who Have Sex with Men in Zagreb, Croatia. *AIDS and Behavior,* 2008. 12(3): p. 505 – 512.

[242] Marcus, U., et al., HIV incidence increasing in MSM in Germany: factors influencing infection dynamics. *Eurosurveillance,* 2006. 11: p. 157 – 60.

[243] Stolte, I.G., et al., Low HIV-testing rates among younger high-risk homosexual men in Amsterdam. *Sexually Transmitted Infections,* 2007. 83: p. 387 – 91.

[244] Grulich, A.E. and J.M. Kaldor, Trends in HIV incidence in homosexual men in developed countries. *Sex Health,* 2008. 5(2): p. 113 – 8.

[245] Williamson, L.M., et al., HIV testing trends among gay men in Scotland, United Kingdom (1996–2005): implications for HIV testing policies and prevention. *Sexually Transmitted Infections,* 2009. 85(7): p. 550 – 554.

[246] Cowan, et al., HIV AND RISK BEHAVIOUR AMONG MEN WHO HAVE SEX WITH MEN IN DENMARK—THE 2006 SEX LIFE SURVEY. Vol. 13. 2008, Saint-Maurice, FRANCE: Centre européen pour la surveillance épidémiologique du sida. 6.

[247] Moreau-Gruet, F.D.-A., F.; Jeannin, A., Long-term HIV/AIDS-related prevention behaviours among men having sex with men: Switzerland 19922000. *AIDS Care,* 2006. 18: p. 35 – 43.

[248] Costenbader, E., Otiashvili, D., Meyer, W., Zule, W., Orr, A., Kirtadze, I., Secrecy and risk among MSM in Tbilisi, Georgia. *AIDS Care,* 2009. 21: p. 591 – 597.

[249] Ismailova, A., HIV-Infection situation analysis among MSM in Central Asia. 2010: Almaty.

[250] Schmidt, A.J., Benvenuti, S., Breveglieri, M., Ferrer, L., Folch, C., Hicksonm F., Hospers, H.J., Marcus, U., Mikolaychuk, M., Mirandola, M., Reid, D., Weatherburn, P., for the EMIS consortium, The European MSM Internet Survey (EMIS) UNGASS indicators. 2010.

[251] Montaner, J.S.G., et al., Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: a population-based study. *he The Lancet,* 2010. 376(9740): p. 532 – 539.

[252] Granich, R.M., et al., Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: a mathematical model. *The Lancet,* 2009. 373(9657): p. 48 – 57.

[253] Blower, S.M., H.B. Gershengorn, and R.M. Grant, A Tale of Two Futures: HIV and Antiretroviral Therapy in San Francisco. Science, 2000. 287(5453): p. 650 – 654.

[254] Cohen, M.S., HIV Treatment as Prevention: To be or not to be? *Journal of Acquired Immune Deficiency Syndromes,* 2010. 55(2): p. 137 – 138 10.1097/QAI.0b013e3181f0cbf3.

[255] Vanable, P.A., et al., Impact of Combination Therapies on HIV Risk Perceptions and Sexual Risk Among HIV-Positive and HIV-Negative Gay and Bisexual Men. *Health Psychology,* 2000. 19(2): p. 134 – 145.

[256] Smith, R.J., et al., Evolutionary dynamics of complex networks of HIV drug-resistant strains: the case of San Francisco. Science, 2010. 327(5966): p. 697 – 701.

[257] Folch, et al., Factors associated with unprotected sexual intercourse with steady male, casual male, and female partners among men who have sex with men in Barcelona, Spain. Vol. 18. 2006, New York, NY, ETATS-UNIS: Guilford. 16.

[258] Elford, J., et al., Combination therapies for HIV and sexual risk behavior among gay men. *Journal of Acquired Immune Deficiency Syndrome,* 2000. 23(3): p. 266 – 71.

[259] Elford, J., et al., HIV positive and negative homosexual men have adopted different strategies for reducing the risk of HIV transmission.*Sexually Transmitted Infections,* 2001. 77(3): p. 224 – 5.

[260] Kelly, J.A. and S.C. Kalichman, Reinforcement value of unsafe sex as a predictor of condom use and continued HIV/AIDS risk behavior among gay and bisexual men. *Health Psychology,* 1998. 17(4): p. 328 – 35.

[261] Ostrow, D.E., et al., Attitudes towards highly active antiretroviral therapy are associated with sexual risk taking among HIV-infected and uninfected homosexual men. *AIDS,* 2002. 16(5): p. 775 – 80.

[262] Stolte, I.G., et al., Association Between 'Safer Sex Fatigue' and Rectal Gonorrhea Is Mediated by Unsafe Sex With Casual Partners Among HIV-Positive Homosexual Men. *Sexually Transmitted Diseases,* 2006. 33(4): p. 201 – 208 10.1097/01.olq.0000194596.78637.8e.

[263] Elford, J., G. Bolding, and L. Sherr, High-risk sexual behaviour increases among London gay men between 1998 and 2001: what is the role of HIV optimism? *AIDS,* 2002. 16(11): p. 1537 – 44.

[264] Grant, R.M., et al., Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men. New England Journal of Medicine, 2010. 363(27): p. 2587 – 2599.

[265] Okwundu CI, O.C., Antiretroviral pre-exposure prophylaxis (PrEP) for preventing HIV in high-risk individuals. *Cochrane Database Syst Rev,* 2009. 1.

[266] van Kesteren, N.M.C., H.J. Hospers, and G. Kok, Sexual risk behavior among HIV-positive men who have sex with men: A literature review. *Patient Education and Counseling*, 2007. 65(1): p. 5 – 20.

[267] Balthasar, H., et al., Intentional Risk Reduction Practices of Men in Switzerland Who Have Anal Intercourse With Casual Male Partners. *Journal of Acquired Immune Deficiency Syndromes,* 2010. 54(5): p. 542 – 547 10.1097/QAI.0b013e3181e-19a6b.

[268] Jin, F., et al., Unprotected anal intercourse, risk reduction behaviours, and subsequent HIV infection in a cohort of homosexual men. *AIDS,* 2009. 23(2): p. 243 – 252 10.1097/QAD.0b013e32831fb51a.

[269] Kippax, S., et al., Sexual negotiation in the AIDS era: negotiated safety revisited. *AIDS,* 1997. 11(2): p. 191 – 197.

[270] Bourne, A.D., C.; Keogh, P.; Weatherburn, P.; Hammond, G., Relative safety II: risk and unprotected anal intercourse among gay men with diagnosed HIV. 2009 Sigma Research: London.

[271] Parsons, J.T., et al., Sexual harm reduction practices of HIV-seropositive gay and bisexual men: serosorting, strategic positioning, and withdrawal before ejaculation. *AIDS,* 2005. 19: p. S13 – S25.

[272] Brenner BG, R.M., Routy JP, Moisi D, Ntemgwa M, Matte C, Baril JG, Thomas R, Rouleau D, Bruneau J, Leblanc R, Legault M, Tremblay C, Charest H, Wainberg MA; Quebec Primary HIV Infection Study Group., High rates of forward transmission events after acute/early HIV-1 infection. *Journal of Infectious Diseases.* , 2007. 195(7): p. 951 – 9.

[273] Fisher, M., et al., Determinants of HIV-1 transmission in men who have sex with men: a combined clinical, epidemiological and phylogenetic approach. *AIDS,* 2010. 24(11): p. 1739 – 1747 10.1097/QAD.0b013e32833ac9e6.

[274] Truong, H.-H.M., et al., Increases in sexually transmitted infections and sexual risk behaviour without a concurrent increase in HIV incidence among men who have sex with men in San Francisco: a suggestion of HIV serosorting? *Sexually Transmitted Infections,* 2006. 82(6): p. 461 – 466.

[275] Kizub, D., Deobald, I., Masenior, N., Peryshkina, A., Wirtz, A., Kostetskaya, I., Sifakis, F., Beyrer, C. , Advocating for HIV and STI Prevention Services and Strengthening the Advocacy Capacity of Groups Representing Men Who Have Sex with Men in the Russian Federation: Study of the Needs of Men who Have Sex with Men with Respect to HIV and STI Prevention and Medical Care in Russia. 2009, AIDS Infoshare: Moscow.

[276] WRIGHT, M.T., Homosexuality and HIV/AIDS prevention: the challenge of transferring lessons learned from Western Europe to Central and Eastern European Countries. *Health Promotion International*, 2005. 20(1): p. 91 – 98.

[277] Peryshkina, A., Kizub, D., Deobald, I., Moguilnyi, V., Masenior, N., Wirtz, A., Kostetskaya, I., Sifakis, F., Beyrer, C. Men who have sex with men (MSM), physicians, and non-government organizations (NGOs): finding agreement on the HIV risk environment and service provision for MSM in Russia. in International AIDS Conference 2010. 2010. Vienna.

[278] UNAIDS, An introduction to indicators: UNAIDS monitoring and evaluation fundamentals. 2010.

[279] European Centre for Disease Prevention and Control/WHO Regional Office for Europe, HIV/AIDS surveillance in Europe 2009. 2010, European Centre for Disease Prevention and Control: Stockholm.

[280] European Centre for Disease Prevention and Control, Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report. 2010, ECDC: Stockholm.

[281] Merson, M.H., et al., The history and challenge of HIV prevention. *The Lancet,* 2008. 372(9637): p. 475 – 88.

[282] De Schutter, O., Homophobia and Disctrimination on Grounds of Sexual Orientation in the EU member states: Part 1 – legal analysis. 2008, European Union Agency for Fundamental Rights.

[283] Leobon, A., et al., A relative profile of HIV-negative users of French websites for men seeking men and predictors of their regular risk taking: a comparison with HIV-positive users. *AIDS Care,* 2011. 23(1): p. 25 – 34.

[284] Folch C, M.R., Zaragoza K, Casabona J., Sexual risk behaviour and its determinants among men who have sex with men in Catalonia, Spain. 2009, Saint-Maurice, FRANCE: Centre européan pour la surveillance épidémiologique du sida. 7.

[285] Save The Children, T.-C.f.I.a.C.o.R.H., Infectious Diseases, AIDS and Clinical Immunology Research Center, Characteristics, High-Risk Behaviours and Knowledge of STI/HIV/AIDS, and Prevalence of HIV, Syphilis and Hepatitis Among MSM in Tbilisi, Georgia: 2007. 2008, PATH, USAID.

[286] Baral, S., et al., Male sex workers in Moscow, Russia: a pilot study of demographics, substance use patterns, and prevalence of HIV-1 and sexually transmitted infections. *AIDS Care,* 2010. 22(1): p. 112 – 118.

[287] Beyrer, C., et al., The Global HIV Epidemics among men who have sex with men. 2011, World Bank.

[288] Crago, A.L., Arrest the violence. Human Rights abuses against sex workers in Central and Eastern Europe and Central Asia. 2009, Sex Workers' Rights Advocacy Network in Central and Eastern Europe and Central Asia.

[289] Crago, A.L., et al., Central & Eastern Europe and Central Asia: police raids and violence put sex workers at risk of HIV. HIV/AIDS Policy & Law Review / *Canadian HIV/AIDS Legal Network*, 2008. 13(2 – 3): p. 71 – 2.

[290] Rhodes, T., et al., Police violence and sexual risk among female and transvestite sex workers in Serbia: qualitative study. *BMJ,* 2008. 337(7669).

[291] Young, C., Anti-Gay Russia. Why is a former Communist country so homophobic?, in Reason. 2007.

[292] Human Rights Watch, Russia: Block St. Petersburg homophobic law. 2012.

[293] Russian LGBT Network, Discrimination on Grounds of Sexual Orientation and Gender Identity in Health Care, Education, Employment and Social Security in the Russian Federation in UN Committee on Economic, Social and Cultural Rights. 2011: Geneva.

[294] Rainbow Project, Through Our Eyes—experiences of Lesbian, Gay and Bisexual people in the Workplace. 2011.

Chapter 5

Conclusion

5.1 The HIV epidemics of Europe in key populations at high risk

Despite decreases in the rate of spread in the last decade, the number of HIV cases in Europe continue to increase, and by 2011, reached over 1.2 million individuals, with over half a million diagnoses reported in the last five years. Between 2006 and 2010, there have been 127 new diagnoses each year per million people in Europe. Our review of national case reports, indicates that the continuing increase in new HIV cases in Europe is fuelled by epidemics in the East. Whereas, an average of 74 and 11 new diagnoses per million were reported in the West and Centre between 2006 and 2010, there were 273 per million people in the East. In the last five years, new diagnoses are relatively stable in the West and Centre, but increasing (by around 30%) in the East, with the highest rates of new diagnoses in Estonia, Russian Federation and Ukraine. The proportion of cases among women are declining in the West and Centre, but remain consistent in the East (at 41%).

5.1.1 HIV among people who inject drugs

Between 2006 and 2010, 25% of case reports in Europe were associated with injecting drug use, with higher proportions in the East (33%) than West (5%) and Centre (7%). Whereas there was an annual average of 89 reported HIV diagnoses associated with injecting drug use per million people in the East in this five year period, there were 3.6 per million in the West and 0.8 per million in the Centre. The countries with the highest levels of reported diagnosed cases among PWID in Europe were the Ukraine (153 per million people), Russian Federation (98 per million people), and Kazakhstan (78 per million people).

Findings from HIV prevalence studies show that prevalence among PWID is highest in Estonia (55.3%), Spain (34.5%), Russian Federation (28.9%), Republic of Moldova (28.6%) and Ukraine (22.9%). Our review of multivariate risk factors linked to HIV among PWID shows that a history of injecting with previously used injecting equipment, injecting with greater frequency, and a longer history of injecting career were linked to HIV. When aggregated across multivariate studies, being of female gender emerges as a risk factor.

5.1.2 HIV among sex workers

With few exceptions, European countries do not collate risk factor information concerning sex work as part of case reporting. Our review of HIV prevalence studies shows that HIV remains low among female sex workers who do not inject drugs, at less than 1% in the West. [1 – 12] HIV prevalence among female SWs in the East is generally higher than in the West and Centre, ranging from around 2% to 8%).

Our review shows a clear relationship between higher HIV prevalence and higher prevalence of injecting drug use among SWs. In our review of multivariate studies, a history of injecting drug use emerges as a

prime risk factor for HIV among SWs in many countries, [13 – 15] though not universally. [16] Other factors linked to higher odds of HIV or STIs among SWs included: migration from Africa, [15] though other studies show no associations with migration [2, 4, 17]; lack of service contact through outreach; [17] contact with HIV testing and STI services; [2, 12 – 13] street-based sex work; [12 – 13, 16] unprotected sex with non-paying partners; [17] and unprotected sex with clients. [18] In the West, HIV prevalence is higher among male and transgender sex workers than FSWs, even when injecting is lower reflecting the higher prevalence of HIV among MSM, the main client group of MSWs.

5.1.3 HIV among men who have sex with men

Case reporting data shows that sex between men was reported for 10% of all HIV diagnoses in Europe, and higher in the West (36%), than Centre (22%) or East (0.5%). Between 2006 and 2010, the annual average diagnoses linked to sex between men per million people was 27 in the West compared with 2.5 in the Centre and 1.4 in the East, and highest in United Kingdom (43.4), Netherlands (43) and Spain (37.3). But the Centre and East have witnessed marked increases in the number of reported diagnoses associated with sex between men in the last five years.

Our review also shows that estimates of HIV prevalence are highest in the West, but vary from as low as 1.6% in Switzerland to nearly 20% in Spain. We also noted a relative lack of targeted HIV prevalence and risk behaviour survey among MSM throughout the region. Our review of multivariate studies investigating HIV risk factors among MSM linked HIV to inconsistent condom use, unprotected anal intercourse, and a history of STIs. Findings from our systematic review also suggest that the epidemics among MSM in the West may be perpetuated by a core group of MSM and HIV positive MSM engaging in high risk behaviours with a high number of sex partners. [19 – 20]

5.1.4 Overview

We find then, that the HIV epidemics of Europe are greatest in their burden and momentum in the East, where transmission remains primarily linked to injecting drug use. While the epidemics in the West remain primarily linked to sex between men, we see recent increases in such case reports in the East and Centre. It is important to note that such case report data is only as robust as the HIV surveillance systems producing them. Under reporting of risk status, especially among MSM, is likely in settings where social stigma is greatest, arguably in the East of the region. Our synthesis of case report and HIV prevalence data suggest that the allocation of HIV prevention resources should concentrate upon bolstering and expanding prevention responses targeting PWID and their sexual partners in the East of the region, introducing prevention responses among MSM in the East and Centre, and reinvigorating prevention responses among MSM in the West.

5.2 Intersecting epidemics

The HIV epidemics of Europe in key populations at high risk are intersecting epidemics, in which a key site of intersection is sexual risk intersecting with risks related to injecting drug use.

5.2.1 The risk of generalising epidemics through sexual transmission

Our review shows that there is potential for the epidemic to generalise beyond key populations of PWID, SW and MSM, with increasing heterosexual transmission in some countries in the East, notably Ukraine, Estonia and the Russian Federation. Ukraine, for instance, has seen an increased number of HIV case reports associated with heterosexual exposure and a high proportion of them among women with high risk sex partners. This is further supported by outbreaks of STIs in the general population and high prevalence of syphilis and HIV among SWs in some cities (4% and 12%), despite lower levels of recent injecting than reported elsewhere (15%). [21] This study suggested that female SWs who reported having regular male partners who were injectors had increased odds of HIV (OR=2.2 95% CI 1.52 – 3.24). [21]

There is also emerging evidence in Europe of the potential for sexual transmission of HIV among PWID involved in sex work. In Estonia, HIV was not associated with injecting drug use among SWs and they

had correspondingly lower prevalence of HCV suggesting less risky injecting behaviours. [16] A similar pattern has been observed in the Russian Federation: a study showed reduced odds of HCV among females who inject drugs (including both SWs and non-SWs), but increased odds of syphilis pointing to the potential for sexual transmission. [22 – 23] The high prevalence of syphilis reported alongside HIV observed in the Russian Federation, Ukraine, the Republic of Moldova and the Central Asian Republics suggests that conditions may exist for increased sexual transmission of HIV among SWs in the East of the region.

Our review shows that SWs involved in injecting drug use have higher HIV prevalence than SWs who do not inject drugs, and that HIV prevalence among SWs is highest in the East where HIV prevalence is highest among PWID. There is considerable overlap between sex work and drug injecting in the East, with some studies of SWs suggesting that the majority are also PWID, [24] and studies of PWID suggesting that between a quarter and a half have exchanged sex for money or drugs. [25 – 26] Our review finds that SWs who inject drugs are more vulnerable not only to HIV, but also to violence, increased problems with mental health, reduced condom use and unwanted pregnancies. [27 – 29] Further, a high proportion of male and transgender SWs report injecting drugs. [30 – 34] HIV prevention interventions need to give priority to targeting the intersection of sex work and injecting drug use.

Further, among PWID in Europe the majority of men may have sexual partners who do not inject drugs. In the Russian Federation, for instance, one study among PWID suggested that 41% of male PWID had regular female partners who were also PWID whereas this was the case for 70% of female PWID and 68% of female PWID also involved in sex work. [35] There are contradictory reports as to whether female PWID having a male partner who also injects acts as protective factor by reducing the likelihood of them engaging in risky sexual and injecting behaviours outside of their partnership or whether it increases the risk of sexual transmission through them engaging in sex work to support both her and her partner's drug use. [28, 36 – 38]

While European studies suggest relatively high levels of non-injecting recreational drug use among MSM, there are few estimates regarding injecting drug use, though some studies in the East suggest that high proportions of MSM may also inject drugs. [39 – 40] Our review noted that a substantial proportion of MSM in the region, especially in the East, report also having sex with women.

Taken together, HIV surveillance systems need to increase the accuracy of risk factor data among heterosexual exposures as well as target surveillance among the sexual partners of PWIDs. It is fundamental that HIV prevention responses should integrate sexual health and drug-related health. Among SWs, sexual risk reduction interventions need to better address sexual transmission risk in non-paying and regular relationships. While our review shows consistent condom use with clients is generally the norm among SWs, it is much less common with non-paying partners. Among PWID, sexual health concerns have been eclipsed by an almost exclusive focus on preventing viral transmission liked to the shared use of injecting equipment, and this may be particularly the case in the East, where the potential for onwards sexual transmission appears currently greatest. [41] The majority of PWID in surveys across the region report inconsistent condom use with their regular partners, the majority of whom are non-injectors for male PWID.

5.2.2 Migration as an intersecting factor in HIV vulnerability

European HIV case reports indicate the potential significance of migration. Among MSM in the West, 5.8% of diagnoses in 2010 were among men who originated from elsewhere in the West and 2.8% (281) were among men from the Centre or East. Among diagnoses in the West associated with injecting drug use, 4.3% originated elsewhere in the West and 20% (181) in the Centre or East. Among cases associated with heterosexual exposure in the West, over a third were among people who originated from a country with a generalised HIV epidemic. Evidence internationally indicates that local and international migration can have important effects in the dynamics of HIV transmission, both among vulnerable groups and in relation to heterosexual exposure. [15, 42 – 43]

There is a pattern among MSM to migrate into the cities, and from cities in the East toward the metropolises of Western Europe. An effect of homophobia in the region is generating mobility among MSM who tend to move or travel to urban centres, considered more gay-friendly and less stigmatising. [30, 44 – 45] The surveys we reviewed suggested that a significant minority of MSM are migrants; up to 15% in many sites. [30, 46 – 48] Studies of MSM in some cities show higher prevalence of HIV among migrant MSM. [49]

In the last twenty years, there are increasing numbers of migrant women working in the European sex industries. In the West, the majority of SWs are migrant women, most of whom are East European and African. Being a migrant emerges in some studies of SWs as a risk factor for HIV, but in others, there is no such association, most likely reflecting the HIV prevalence within country of origin. [2, 15, 17, 50] A systematic review examining the effect of migration on the risk of HIV among migrant SWs found that overall HIV prevalence was highest among migrants from Africa. Where there was no injecting drug use, HIV prevalence was lower among international migrants from Africa working in high-income countries compared to internal African migrants working within other African countries. The risk of HIV among migrant SWs is likely mediated by local contexts such as the availability of services to migrants, immigration policies, and local organisation of the sex industry. [51]

Taken together, there is a need to better monitor migrant status in HIV surveillance as well as to increase the accessibility of HIV prevention responses to migrant PWID, SWs and MSM, including through the translation of existing materials, and messaging via the internet and travel companies, including those servicing the gay tourist market. [12, 17, 52]

5.3 Environmental factors shaping HIV risk

While the epidemiological studies we reviewed rarely explicitly embraced exploration of social determinants, our synthesis of data on HIV risk factors nonetheless points to the potential role of environmental level factors in HIV transmission (Chapter 3). Our discussion of HIV prevention responses (Chapter 4), also highlighted that the development and impact of interventions can be shaped by social and structural context.

Our review points to regional differences, suggesting that levels of risk behaviour among key populations tend to be highest in the East. While the frequency of reported needle or syringe sharing is highly variable across Europe, there are instances of especially high levels of sharing in the East and Central Asia. Among SWs, the systematic review showed that condom use with clients was consistently higher in the West than East or Centre. Among MSM, the highest rates of condom use during anal sex emanate from studies in the West, with rates around 15% higher than those reported in the East. Reports of unprotected anal intercourse are also higher in the East than West or Centre. Most PWID across the region report inconsistent condom use with their regular partners, with a substantial minority reporting inconsistent condom use with their casual partners.

Among PWID, our review of multivariate studies pointed to unemployment, gender and aspects of the legal environment as potentially important. Regarding gender, women who inject drugs tend to be younger than their male counterparts, engage in higher rates of needle and syringe sharing, and more likely to share their sex partners' injecting equipment and engage in riskier sexual practices. [36, 53 – 59] Regarding the legal environment, ever having been arrested and ever having spent time in prison emerged as risk factors for HIV. Rates of arrest were high among PWID surveyed, especially in the East. Qualitative studies in the region link police arrest, as well as the fear or experience of police violence with reduced capacity for risk reduction. [60 – 62] There is a need to systematically document the prevalence and contexts of policing practices, including extrajudicial practices, which may violate the human rights of PWID as well as potentially impact upon their HIV risk reduction capacity. These data also suggest that there is an urgent need to maximise the coverage and intensity of HIV prevention interventions in prison settings. These findings are corroborated by studies internationally. [60 – 61] [63 – 67]

Among SWs, violence emerges as an important contextual determinant of HIV risk, linking to HIV both directly and indirectly. Reported levels of sexual and physical violence among SWs were high, and appeared most common among minority groups (transvestites, Roma) and in the East. [12, 52, 68 – 70] Evidence also points to aggressive policing practices, especially in the East, exacerbating the potential for HIV risk by women having to work longer hours to make up time after arrest, having unprotected sex for more money to make up lost income, and not carrying condoms as they may be used as evidence of sex work. [63, 71 – 72] Explicitly linked to policing is legislation regulating sex work, which is a key structural determinant of violence and HIV risk. The practice of criminalising activities related to sex work can reduce opportunities for communication between SWs and often resulting in the concentration of sex work into tolerance zones. [73 – 74] While the evidence shows a decriminalised approach results in a safer working environment and improved health, these benefits can be limited by other policies such as those related to migration, and may exclude some of the more vulnerable populations. [75 – 76]. The evidence suggests that where sex work is unregulated and accompanied by police corruption as in the East results in the most risky environments. [72, 77] Legislation may also influence community attitudes towards SWs with criminalization of sex work reinforcing negative attitudes and violence towards sex workers and hinder the implementation of targeted services as reflected in fewer number of targeted services for sex workers in the Russian Federation. [78] [79] Repressive policies will reduce SWs access to HIV services particularly, as often reported in the East, when HIV testing is enforced following detention by police.

In our ecological analysis, the strongest and most consistent association we found was a linear relationship between an increased number of people imprisoned per 100,000 population and increased HIV prevalence among PWID and FSWS (Chapters 4.2 and 4.3). Prison, an effect of criminalisation of drug use and sex work, can constitute a risk environment for the acquisition of HIV.

Among MSM, the reviewed evidence suggests that social stigma in relation to male homosexuality emerges as a key factor influencing men's capacity for risk reduction efforts. Felt stigma also constrains the potential impacts of HIV surveillance and prevention efforts, disabling HIV prevention help-seeking efforts as well as encouraging under reporting of same sex activity as risk factors in HIV surveillance efforts. Institutionalised social stigma experienced by MSM can be viewed as a form of 'structural violence' mediating HIV risk indirectly as well as directly.

5.4 Towards a social epidemiology of HIV vulnerability

Our review identified a number of cross-cutting environmental factors as key domains of future social epidemiological research investigating HIV risk and vulnerability in the region: criminalisation of key populations, drug use and sexual practices; the experience of social stigma and discrimination; migration; gender inequalities; and material inequalities. This is not an exhaustive list and does not discount the potential importance of multiple other structural factors. Future epidemiological and intervention studies of HIV among key populations at high risk need to better systematically delineate how micro-and macro-environmental factors combine to increase or reduce HIV risk.

Social determinants are often 'non-linear' and 'indirect' in their effects, and this presents considerable challenges to delineating causative relationships. Researching the delineation of causal pathways to HIV transmission demands a shift from binary epidemiologic models of simple 'cause and effect' to 'multi-level' models, which emphasise HIV as an outcome of multiple contributing factors interacting together. HIV is best envisioned as an outcome of a 'complex system' of interactions occurring within and between individuals and their environments, with the challenge being to better capture the dynamism of these reciprocal relations.

Our review identified structural indicators relating to criminalisation, low income, and gender inequality as important. But how these factors may directly or indirectly mediate pathways of risk towards HIV transmission is often unclear, as well as situation dependent. Poverty, for example, does not have a

straight forward relationship to HIV. [80 – 82] Our ecological analysis, for example, illustrated how those settings with higher GNI per capita tended to have higher HIV prevalence among MSM. Similarly, gender inequality is reproduced non-linearly through situation specific interactions occurring simultaneously at the structural level (for example, via laws or policy), at the level of the community or household (for example, through social norms, values and networks), and through individual and interpersonal actions (for example, through risk negotiation and behaviour). A risk factor for HIV such as physical violence, for instance, may act as a proximal indicator of structurally determined social marginalisation indirectly mediated through a combination of gender and material inequalities. [83 – 84] There is a need for an iterative and mixed-methods research approach, in which qualitative evidence helps to map risk environment pathways, which are further elaborated through multi-level epidemiology, leading to empirically-informed models of social and structural HIV prevention.

5.5 Strengthening HIV surveillance

Our review noted the need for a systematic assessment of the robustness of methods used to monitor HIV prevalence and risk in key populations over time. We also noted the need to expand or introduce repeated studies to measures these, as well as indicators of HIV incidence, in some countries. HIV surveillance studies were found to be better established among PWID than among SWs and MSM, with very little data available among migrants and male SWs. Establishing mechanisms for repeated measures of HIV prevalence and risk is especially important, as is the development of a centralised portal for the synthesis of such data to enable cross region comparisons.

Moreover, HIV surveillance systems provide unrealised opportunities to collate data on indicators of HIV prevention intervention coverage, as outlined in 3rd generation surveillance guidelines. [85] Data on the coverage of combination interventions is especially important. Where feasible, surveillance systems should also be geared towards monitoring indicators of how the social and structural context mediate HIV, for instance, estimating the prevalence of violence among SWs and MSM and of police contact among PWID.

A key challenge in collecting data to inform interventions is the political context in which sex work, drug use and sex between men takes place. In contexts where, for example, sex work is heavily regulated or sex between men is stigmatised, conducting HIV related surveillance studies among people with few rights or representation may create ethical or safety challenges. Proposals for HIV related surveillance studies need to be conducted with full consultation with affected populations, and with appropriate rights protections in place. [86] There are some useful lessons in good surveillance practice in Europe, including for instance, the EMIS among MSM, the sentinel surveillance of HIV and risk among PWID in Spain, the United Kingdom and Italy, and sentinel surveillance among SWs in Central Asia. [50, 87 – 90]

Our review of surveillance data shows higher rates of HIV testing in the East, especially in the Russian Federation. This may result from mandatory testing of migrants and the practice of ‘opt-out’ rather than ‘opt in’ testing polices at various clinic and health service settings. [91 – 92] Evidence reviewed tends to show the protective effect of HIV testing in reducing HIV risk among PWID and SWs and UAI among MSM. [35] The uptake of HIV testing needs to be increased but simultaneously increasing access to treatment and reducing stigma associated HIV positivity and the removal of structural barriers to employment and discrimination for those diagnosed.

5.6 Strengthening HIV prevention

5.6.1 People who inject drugs

Among PWID, we noted the well established scientific evidence in support of needle and syringe programmes (NSP), opioid substitution treatment (OST), and antiretroviral HIV treatment (ART) as methods of reducing HIV risk and preventing HIV transmission. [93] The combination of NSP, OST and ART

are to be reinforced as cornerstone interventions of HIV prevention policy in Europe, and it is essential that they are sufficiently scaled-up. Estimates of NSP, OST and ART coverage among PWID vary throughout the region, but coverage is generally lowest in the East, where HIV prevalence is higher.

Evidence, including in Europe, [94] indicates that core HIV prevention interventions targeting PWID have enhanced impact when they are delivered in combination. [94 – 95] Stand-alone interventions may have limited impact on reducing HIV incidence even with good coverage. [94, 96] The enhanced HIV prevention effects of combining OST with NSP and ART have particular resonance for countries – for instance, the Russian Federation and Ukraine – experiencing large HIV outbreaks among PWID. The effectiveness of HIV prevention policies depends upon the combined effects of multiple integrated interventions and bringing these to scale. [96]

Findings from our modelling analysis show that high but achievable coverage levels of NSP can result in large decreases (>30%) in HIV incidence and prevalence in settings with high HIV prevalence among PWID. Required coverage levels are much lower when interventions are combined or in lower prevalence settings. The analysis also highlights the importance of combination interventions for reducing HIV incidence and prevalence to low levels in high prevalence settings, with no single intervention (or only at high coverage in the lower prevalence setting of Dushanbe) being able to reduce HIV incidence to less than 1% or prevalence to less than 10% in 20 years. Modelling shows that when core interventions are delivered in combination, coverage targets become more feasible, although still remain considerable, with about 60% coverage of all three core interventions being required in Tallinn and St. Petersburg over 20 years and about 30% coverage in Dushanbe, to reduce HIV prevalence to less than 10%.

Intervention availability and coverage is shaped by the policy and social environment, and we have noted, for instance, how law enforcement, policing practices, and national commitments to HIV prevention can limit HIV prevention coverage potential. We have noted, for instance, how in the Russian Federation – a setting of major HIV epidemic – the legal and social environment has constrained, even prohibited, the development of proven-to-be-effective HIV prevention intervention, such as OST. Structural interventions bringing about policy, legal or social change are required to enable sufficient HIV prevention scale-up, and this is arguably most urgent in the East of the region. The package of combination HIV prevention interventions promoted by WHO and other international agencies as core to national HIV prevention programming (which include NSP, OST and ART) under-emphasises the potential role of social and structural intervention approaches. International evidence points to the potential HIV prevention impact of interventions fostering social and structural change. [97 – 98] For instance, social network interventions encouraging PWID to promote risk reduction among their injection and drug using networks are associated with reduction in the risk behaviour of participating PWID as well as their network members.[99 – 103] The secondary distribution of sterile injecting equipment through peer networks of PWID is a practical yet under-formalised example of how to diffuse HIV prevention through geometric progression in social networks. [104 – 106] The introduction of supervised injecting centres in six countries in Europe, as well as internationally, has been prompted by the need to create safer injecting environments, especially given elevated HIV risks linked to injecting in public, in turn linked to homelessness. [96, 107 – 109] Such interventions have attracted PWID at greater HIV risk, reduced syringe sharing, and facilitated access to withdrawal management, drug treatment, and other HIV prevention interventions. [107 – 108, 110 – 121]

Moreover, combination HIV prevention approaches should consider including interventions fostering policy reform as well as legal change. The WHO notes that “the alignment of drug control measures with public health goals [is] a priority”. [122] While lacking in rigorous evaluation, interventions targeting changes in the criminal justice environment include: police HIV prevention training and partnerships; developing alternatives to prison programmes, including coerced or mandated entry to drug treatment via community penalties and court orders; the provision of sterile injecting equipment in prisons, which meta-analyses link to no adverse but positive risk reduction effects; the provision of OST in prisons, linked to improved drug treatment outcomes including post release; and interventions enabling legal aid and legal rights literacy to protect against rights violations, though the HIV prevention impact of these remains unknown.

Interventions which bring about change in the legal environment seek to minimise the iatrogenic health effects of the criminalisation of drug users and of the prohibition of HIV prevention interventions. Ecological evidence indicates elevated odds of HIV and HIV risk among IDUs in settings without legal access to HIV prevention interventions such as OST and NSP compared to settings with access. [123 – 125] The relaxation of legal restrictions to the provision of sterile needles and syringes increases their availability and accessibility, reducing levels of risk behaviour, as well as potentially levels of police harassment among IDUs. [63, 84, 123, 126 – 130] If HIV risks are in part associated with the criminalization of drug use per se, as increasingly evidenced internationally, [131 – 134] then decriminalizing drug use is also a strategy to reduce such harm. [111, 133]

5.6.2 Sex workers

International evidence has shown the importance of targeted interventions for SWs as well data from our ecological analysis linking a reduction in HIV with increasing numbers of services that address not only HIV/STI but broader social and health problems (Chapter 4.3). HIV prevention frameworks for SWs need to recognise that an individual may not identify themselves as a sex worker sufficiently to engage consciously in behaviour change to minimise sex work related harms. Many interventions targeting SWs exclude those who do not self identity as such.[44, 135] The focus of services in the East, for instance, has been among SWs who inject drugs rather than targeting the health and welfare needs of SWs more broadly. [136] Evidence internationally indicates that interventions which specifically target SWs show greater promise in reducing sexual risk, including the risk of sexual violence, when compared against drug-related harm reduction interventions targeting SWs who use drugs. [137] The vertical structure of health systems, especially the East of the region, compounds the problem of targeting HIV prevention to all those potentially in need, as there is often little linkage between drug treatment and sexual health services. It is fundamental that HIV prevention interventions specifically target SWs, including those not involved in drug use and who may not define themselves as connected to the sex industry. It is also important that drug and sexual health services are sufficiently integrated to maximize their coverage potential.

Indicators of coverage by SW services across the region was limited. Data on HIV testing suggested that over a third of SWs across the region had been tested for HIV but this may reflect testing following arrest or detainment or as a result of mandatory testing through regulation as in Greece rather than voluntary testing. The European Centre for Disease Control highlighted the limited scope of behavioural surveillance among sex workers in EU countries usually collected through one off surveys rather than on going or repeated surveillance at a national level. [86] There was also little consistency in the type of indicators collected making comparisons difficult to draw. The routine collation of reported HIV or STI testing at SW services would facilitate an estimate of the effective coverage of services in relation to HIV prevention taking into account the need for consultation and protection of privacy as discussed above. Routinely monitoring condom use with clients and non-paying partners would also give an insight into sexual risk behaviours, as the high prevalence of gonorrhoea underscores the persistent sexual vulnerability of SWs.

The reviewed literature emphasizes the heterogeneous nature of sex worker populations in Europe. This again emphasizes the need to tailor intervention approaches accordingly. The rapidly changing sex worker scene in Europe accentuates the need for flexible and innovative approaches to health service provision, especially in relation to the diversification of indoor sex work and the increased involvement of migrant women in sex work. With the growing number of indoor sex workers across the region, there is a need for interventions to reach off-street sex workers. Projects in the United Kingdom have attempted to address this by conducting outreach on line: contacting women via websites and circulating frequent emails about services. The increase in migrant women means that one of main priorities for short term intervention is provision of translation, especially in the West of Europe experiencing migration from the East as well as South America and Sub-Saharan Africa.

There have been increased calls for applying a pragmatic 'harm reduction' approach to sex work as more commonly applied in relation to drug use. [138 – 139] A harm reduction framework for sex work seeks to envisage how a variety of harms related to sex work might be relevant, directly or indirectly, to HIV prevention. Our review identified violence as a primary concern. Community-level interventions such as the Ugly Mugs scheme implemented successfully throughout most of West Europe should be introduced to projects in the East and Centre. Violence experienced by SWs in family, social and work relationships is contextualized by broader social and structural violence feeding social stigma and discrimination. [97, 140 – 141] Indirect pathways that mediate risk of violence include reducing self esteem and ability to negotiate safer practices for fear of further violence, increasing drug use to manage the stress of violence or forced relocation of sex work to less familiar or safe areas. [84, 142 – 144]

The significance of violence in the everyday lives of SWs emphasizes the need for envisaging HIV prevention inside a social and structural intervention approach to reducing sex work risks of which HIV is one. HIV prevention interventions should be nested inside change strategies that simultaneously address the social welfare of sex workers and their social determinants of health, including disparities in employment opportunity, income, and access to welfare services. [139, 145] [138] Key targets for health interventions targeting SWs, in addition to HIV risk reduction, include reducing violence and unwanted pregnancies, and improving mental and emotional health. [146] For instance, sexual health interventions throughout the region need to focus not only on sexual safety negotiations with clients of SWs but also on promoting contraceptive use among the non-paying sex partners of SWs to prevent unplanned pregnancy and unprotected sex.

The evidence reviewed indicates that the criminalization of sex work can disable rather than enable capacities for health protection. [74, 139, 142, 147] There is potential HIV prevention impact linked to the decriminalisation of sex work, including indirectly through the potential reduction in violence and protection of sex workers' mental health. [148 – 150] A long-term strategy of public health may include the decriminalization of sex work across the region. In the short and medium-term, emphasis should be given to community-level interventions, such as the development of managed street sex work zones, which have shown positive effect in reducing incidences of violence and providing a safer place to work. Managed street zones need consent of local communities, and need to clearly assign responsibilities to authorities to manage the zone. [151]

5.6.3 Men who have sex with men

An important finding of the review is that access to mainstream sexual health provision for MSM can be impeded by staff hostility borne out of the dual stigma of homosexuality and HIV, and patient fears concerning breaches of confidentiality. [152 – 154] Such concerns appear more acute in the East. For instance, social stigma appears to act as a deterrent to timely HIV testing and levels of HIV testing are lower in the Centre and East.

Evidence suggests that HIV testing can increase condom use for anal intercourse, [155 – 156] but for HIV-negative men is a more effective HIV prevention strategy when accompanied by effective counselling on risk reduction. [40] Effective counselling is rare in contexts where specialised services are rarely available, as is the case for example in the Russian Federation. [153, 157] Dedicated MSM-only test facilities are needed in countries where most physicians are inclined to hostility toward MSM. For full impact, it is essential that links are made with other prevention services appropriate to the needs of MSM, particularly in the East where many MSM appear poorly informed of the HIV risks linked to certain practices.[158] Paying for tests and other medical care is a major barrier to uptake and should be discontinued.

While HIV prevention among MSM has traditionally focused on consistent condom use, factors such as availability, cost and 'condom fatigue' have been considered as reasons why men participate in unprotected anal intercourse. [159 – 162] To address this, condoms should be made freely available in all gay venues and known meeting places required as a condition of local authority licensing. Additionally, strategies other than a reliance on 100% condom use are needed such as encouraging slower rates

of partner change, fewer partners, and especially the avoidance of multiple concurrent partnerships. Concurrency is a key risk factor in the spread of HIV because people are more inclined to use condoms in casual relationships, [20, 163] but the establishment and maintenance of trust in a relationship encourages unprotected intimacy and then sets up barriers to honesty about any infidelity. [164 – 165] Other strategies should involve encouraging the practices of sex acts other than anal sex. [160]

In the West, social stigma appears less prominent as a factor shaping access to help and risk reduction, HIV testing is more common, knowledge of the risks posed by UAI is higher, and condoms are widely available.[166 – 167] However, many MSM continue to have unprotected sex frequently with casual partners. In a context of the widespread availability of HAART, there may also be a misplaced reliance on negative HIV results when selecting sex partners. [168 – 169] Only HIV positive people can definitely 'know their status'. The population groups in which HIV incidence is high are those in which unprotected and casual sex are more easily socially accepted, and the persistent focus of prevention strategies on 'technical solutions' (condoms, testing, HAART) may do little to shift such social norms, which renders a reliance on HIV testing for prevention dangerously misleading. Interventions need to question how strategies of 'serosorting' are applied in practice, for they may promote a false sense of security and counselling alongside HIV testing is necessary to address any misconceptions regarding the safety of relying upon recent HIV-negative test results as a rationale for unprotected sex.

Complacency about infection and treatment availability complicates prevention messages in the West. There is some evidence that good adherence to HAART can reduce viral load to undetectable levels, and that HAART therefore acts as HIV prevention. [170 – 171] This has led to much debate about 'negaotiated safety strategy' as an HIV prevention strategy where sexual partners agree to dispense of condoms within their relationship while at the same time negotiate sexual agreement outside the regular relationship. However, some residual risk resulting from infidelity or lapses in the agreed condom use in sex outside the partnership still exists, resulting in some infections. Moreover, in gay communities where open relationships and casual sex with multiple partners is the norm, promotion of treatment as a prevention method can be unhelpful, leading to increased UAI, [163, 172] and perhaps may be linked to the increase in HIV incidence seen among MSM in Western Europe.

Furthermore, patients with undetectable viral load may have detectable virus in semen and therefore be infectious. [173 – 175] Many of the studies providing the evidence of effectiveness of treatment as prevention are based on mathematical modelling rather than observed data, which are highly sensitive to the parameters and underlying assumptions of the model, while the remainder are ecological studies which overall give mixed results and are unable to demonstrate causality. [170 – 172, 176] A retrospective cohort study of treatment as prevention [177] found that 5% of the partners of PLHIV on treatment seroconverted, as against 3% of controls (difference non-significant). A false sense of security interacting with much higher risks from acute infections (pre-seroconversion), may result in elevation of risks. An assumption that treatment is protective is particularly problematic in the case of MSM, given that the per-act probability of transmission is so much higher for anal sex [178] than for vaginal sex, [179] and that partner numbers are typically higher. The promotion of HIV treatment as prevention as a strategy for HIV prevention in Europe needs, therefore, to be approached with some caution.

One difficulty with the targeting of HIV prevention in parts of the European region is that it tends to be based on 'Western' models of experience, and these tend historically to be based on interventions targeting homosexually-identified men. Such approaches may tend to over-include men who perform mainly or only the receptive role, since those who tend to take the insertive role may be more likely to identify themselves as heterosexual. [180] It is fundamentally important to recognize the heterogeneous nature of populations of MSM and to tailor interventions accordingly in different parts, and local settings, of Europe.

Our review notes a varied environment in relation to the criminalization and social regulation of homosexuality throughout Europe. Legal changes to decriminalise homosexuality in the parts of the region where

such laws remain (Turkmenistan, Uzbekistan) need to be made. It is important that discrimination on the grounds of sexual orientation should be afforded the same legal punishment and redress in the Eastern part of the region as in the West. [181] Shifts in Western Europe towards recognizing the social inclusion of MSM – for instance, through the legalization of civil partnerships between men – are important social interventions in that they contribute to an enabling context for health and citizenship, including potentially for HIV prevention. Community-level interventions may facilitate some of the social changes required to enable the wider social acceptance of homosexuality, including regarding the day-to-day practices of health, welfare and regulatory institutions, and especially the practices of police and health care professionals. Aside from HIV prevention capacity, our review notes that HIV surveillance systems are much more likely to correctly attribute transmission of HIV between MSM, and thus better allocate treatments, in settings less socially stigmatized.

5.7 A shift towards social-structural intervention approaches

Social and structural interventions seek 'social' or 'structural' change at the level of the society or community and not only individual. We emphasise the need for HIV prevention programmes to embrace social and structural interventions which aim to bring about a contextual change in the environments which mediate HIV risk, with the objectives of removing barriers to HIV prevention and enabling social conditions which protect against HIV vulnerability. Structural approaches emphasise the potential HIV prevention effects of multi-sectoral non-health interventions, including: stigma reduction interventions; de-criminalising drug use, sex work and sex between men; micro-finance and access to employment interventions; [97, 182 – 184] poverty alleviation interventions; [185 – 186] community mobilisation and civil participation interventions; [97, 144, 186] access to housing and welfare interventions; and access to education interventions. [187]

There are a number of intervention approaches which show theoretical, as well as some evidence-based, promise. These include HIV prevention focused interventions which aim to: create safer physical environments (for instance, safer injecting facilities, safer brothel policies, managed sex work zones, reduction in stigma towards MSM); diffuse changes in risk-related norms, values and practices at the level of the peer group and social network (for instance, 'indigenous-leader' interventions' community mobilisation interventions); bring about legal change and/or moderate risk related to legislative and policing practices (for instance, through police partnerships; developing legal and human rights literacy; offering legal aid; advocating for legal or policy reform); as well as non-HIV and non-health focused multi-sectoral initiatives which can be theorised to have an indirect HIV prevention effect. However, evidence assessing social and structural HIV prevention among key populations at high risk remains embryonic, and creating this evidence is a key challenge for the future.

References

[1] European Centre for Disease Prevention and Control, Implementing the Dublin Declaration on Partnership to Fight HIV/AIDS in Europe and Central Asia: 2010 progress report. 2010, ECDC: Stockholm.

[2] Belza, M.J., Prevalence of HIV, HTLV-I and HTLV-II among female sex workers in Spain, 2000 – 2001. *European Journal of Epidemiology,* 2004. 19(3): p. 279 – 82.

[3] Cwikel, J.G., et al., Sexually transmissible infections among illegal female sex workers in Israel. *Sexual Health,* 2006. 3(4): p. 301 – 303.

[4] Folch, C., et al., Prevalence of human immunodeficiency virus, Chlamydia trachomatis, and Neisseria gonorrhoeae and risk factors for sexually transmitted infections among immigrant female sex workers in Catalonia, Spain. *Sexually Transmitted Diseases,* 2008. 35(2): p. 178 – 183.

[5] Gutierrez, M., et al., Prevalence of HIV-1 non-B subtypes, syphilis, HTLV, and hepatitis B and C viruses among immigrant sex workers in Madrid, Spain. *Journal of Medical Virology,* 2004. 74(4): p. 521 – 7.

[6] Linhart, Y., et al., Sexually transmitted infections among brothel-based sex workers in Tel-Aviv area, Israel: high prevalence of pharyngeal gonorrhoea. *International Journal of STD & AIDS,* 2008. 19(10): p. 656 – 9.

[7] Nigro, L., et al., Prevalence of HIV and other sexually transmitted diseases among Colombian and Dominican female sex workers living in Catania, eastern Sicily. *Journal of Immigrant and Minority Health,* 2006. 8(4): p. 319 – 323.

[8] Papadogeorgaki, H., et al., Prevalence of sexually transmitted infections in female sex workers in Athens, Greece—2005. *European Journal of Dermatology,* 2006. 16(6): p. 662 – 665.

[9] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working sex workers in London: the effect of migration from Eastern Europe. In press, 2011.

[10] Vall-Mayans, M., et al., Sexually transmitted Chlamydia trachomatis, Neisseria gonorrhoeae, and HIV-1 infections in two at-risk populations in Barcelona: female street prostitutes and STI clinic attendees. *International Journal of Infectious Diseases,* 2007. 11(2): p. 115 – 122.

[11] EuroHIV, HIV/AIDS Surveillance in Europe. Mid-year report 2006, in HIV/AIDS Surveillance in Europe, EuroHIV, Editor. 2007, French Institute for Public Health Surveillance: Saint-Maurice.

[12] Nielsen, S., et al., STI rates and risk factors among female sex workers attending STI testing sites in Germany, in International Society for Sexually Transmitted Disease Research. 2011: Quebec.

[13] Todd, C.S., et al., Prevalence and correlates of human immunodeficiency virus infection among female sex workers in Tashkent, Uzbekistan. *Sexually Transmitted Diseases,* 2006. 33(8): p. 496 – 501.

[14] Todd, C.S., et al., Prevalence and factors associated with human immunodeficiency virus infection among sex workers in Samarkand, Uzbekistan. *Sexually Transmitted Diseases,* 2009. 36(2): p. 70 – 2.

[15] van Veen, M.G., et al., HIV and Sexual Risk Behavior among Commercial Sex Workers in the Netherlands. *Archives of Sexual Behavior,* 2010. 39(3): p. 714 – 723.

[16] Uuskula, A., et al., A study on HIV and hepatitis C virus among commercial sex workers in Tallinn. *Sexually Transmitted Infections,* 2008. 84(3): p. 189 – 191.

[17] Platt, L., et al., Risk of sexually transmitted infections and violence among indoor-working female sex workers in London: the effect of migration from Eastern Europe. *Sexually Transmitted Infections,* 2011.

[18] Folch, C., et al., Social characteristics, risk behaviours and differences in the prevalence of HIV/sexually transmitted infections between Spanish and inmigrant female sex workers in Catalonia, Spain. [Spanish]. *Medicina Clinica,* 2009. 132(10): p. 385 – 388.

[19] Leobon, A., et al., A relative profile of HIV-negative users of French websites for men seeking men and predictors of their regular risk taking: a comparison with HIV-positive users. *AIDS Care,* 2011. 23(1): p. 25 – 34.

[20] Balthasar, H., et al., Intentional Risk Reduction Practices of Men in Switzerland Who Have Anal Intercourse With Casual Male Partners. *Journal of Acquired Immune Deficiency Syndromes,* 2010. 54(5): p. 542 – 547 10.1097/QAI.0b013e3181e19a6b.

[21] International AIDS Alliance, Behavioural monitoring and HIV infection prevalence among female sex workers as a component of second generation surveillance. 2009, International AIDS Alliance: Kiev.

[22] Platt, L., et al., Effects of sex work on the prevalence of syphilis among injection drug users in 3 Russian cities. *American Journal of Public Health,* 2007. 97(3): p. 478 – 485.

[23] Rhodes, T., et al., Prevalence of HIV, hepatitis C and syphilis among injecting drug users in Russia: Multi-city study. *Addiction,* 2006. 101(2): p. 252 – 266.

[24] Dershem, L., et al., Characteristics, high-risk behaviors and knowledge of STI / HIV / AIDS, and STI / HIV prevalence of facility-based female sex workers in Batumi, Georgia: 2004 – 2006. Report on two behavioral surveillance surveys with a biomarker component for the SHIP Project. USAID Cooperative Agreement No. 114 – A-00 – 02 – 00095 – 00. 2007: [Tbilisi], Georgia, *Save the Children,* 2007 Sep. [59]

[25] Stvilia, K., et al., Prevalence of Hepatitis C, HIV, and Risk Behaviors for Blood-Borne Infections: A Population-Based Survey of the Adult Population of T'bilisi, Republic of Georgia. *Journal of Urban Health,* 2006. 83(2): p. 289 – 298.

[26] Busza, J.R., et al., Street-based adolescents at high risk of HIV in Ukraine. *Journal of Epidemiology and Community Health,* 2010.

[27] Cusick, L., A. Martin, and T. May, Vulnerability and involvement and in drug use and sex work. 2003, Home Office: London.

[28] Kral, A.H., et al., Sexual transmission of HIV-1 among injection drug users in San Francisco, USA: risk-factor analysis. *The Lancet*, 2001. 357: p. 1397 – 1401.

[29] Wood, E., et al., Elevated rates of antiretroviral treatment discontinuation among HIV-infected injection drug users: implications for drug policy and public health. *International Journal of Drug Policy,* 2004. 15: p. 133 – 138.

[30] Baral, S., et al., Male sex workers in Moscow, Russia: a pilot study of demographics, substance use patterns, and prevalence of HIV-1 and sexually transmitted infections. *AIDS Care,* 2010. 22(1): p. 112 – 118.

[31] Belza, M.J., Risk of HIV infection among male sex workers in Spain. *Sexually Transmitted Infections,* 2005. 81(1): p. 85 – 88.

[32] Bruckova, M., et al., HIV infection among commercial sex workers and injecting drug users in the Czech Republic. *American Journal of Tropical Medicine and Hygiene,* 2006. 75(5): p. 1017 – 1020.

[33] Leuridan, E., et al., Male sex workers in Antwerp, Belgium: A descriptive study. *International Journal of STD and AIDS,* 2005. 16(11): p. 744 – 748.

[34] Sethi, G., et al., HIV, *sexually transmitted infections,* and risk behaviours in male sex workers in London over a 10 year period. *Sexually Transmitted Infections,* 2006. 82(5): p. 359 – 363.

[35] Platt, L., et al., Impact of Gender and Sex Work on Sexual and Injecting Risk Behaviors and Their Association With HIV Positivity Among Injecting Drug Users in an HIV Epidemic in Togliatti City, Russian Federation. *Sexually Transmitted Diseases,* 2005. 32(10): p. 605 – 612.

[36] Vioque, J., et al., Prospective cohort study of female sex workers and the risk of HIV infection in Alicante, Spain (1986 – 96). *Sexually Transmitted Infections,* 1998. 74: p. 284 – 288.

[37] Lum, P.J., C. Sears, and J. Guydish, Injection risk behavior among women syringe exchangers in San Francisco. *Substance Use & Misuse,* 2005. 40(11): p. 1681 – 96.

[38] Riehman, K., S., et al., Sexual relationships, secondary syringe exchange, and gender differences in HIV risk among drug injectors. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2004. 81(2): p. 249 – 259.

[39] Save The Children, T.-C.f.I.a.C.o.R.H., Infectious Diseases, AIDS and Clinical Immunology Research Center, Characteristics, High-Risk Behaviours and Knowledge of STI/HIV/AIDS, and Prevalence of HIV, Syphilis and Hepatitis Among MSM in Tbilisi, Georgia: 2007. 2008, PATH, USAID.

[40] Kasianczuk, M.G., et al., Risk Factors Associated with Condom Use Among Men Who Have Sex with Men in Ukraine. *Journal of LGBT Health Research,* 2009. 5(1 – 2): p. 51 – 62.

[41] Strathdee, S.A. and S.G. Sherman, The role of sexual transmission of HIV infection among injection and non-injection drug users. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2003(80 (Supplement 3)): p. S7 – S14.

[42] Ryan, K.A., et al., Characteristics associated with prevalent HIV infection among a cohort of sex workers in Cameroon. *Sexually Transmitted Infections,* 1998. 74(2): p. 131 – 5.

[43] van den Hoek, A., et al., High prevalence of syphilis and other sexually transmitted diseases among sex workers in China: potential for fast spread of HIV. *AIDS*, 2001. 15(6): p. 753 – 9.

[44] Aral, S.O., et al., Commercial sex work, drug use, and sexually transmitted infections in St. Petersburg, Russia. *Social Science & Medicine,* 2005. 60(10): p. 2181 – 2190.

[45] Sokolowski, S., Steffan, E., Schnitzer, S., Oremus, D., Brehm, G., Knowledge, Attitudes and sexual Behaviour with regards to HIV/STIs among MSM in 4 EU countries. 2007, Bordernet. EU.

[46] Adam, P.C.G., I. Teva, and J.B.F. de Wit, Balancing risk and pleasure: sexual self-control as a moderator of the influence of sexual desires on sexual risk-taking in men who have sex with men. *Sexually Transmitted Infections,* 2008. 84(6): p. 463 – 467.

[47] Hurtado Navarro, I., et al., Differences between women and men in serial HIV prevalence and incidence trends. *European Journal of Epidemiology,* 2008. 23(6): p. 435 – 440.

[48] Schwappach, D.L.B. and P. Bruggmann, An integrated model of care to counter high incidence of HIV and sexually transmitted diseases in men who have sex with men–initial analysis of service utilizers in Zurich. *BMC Public Health,* 2008. 8.

[49] Prasad, L.R., et al., Changing epidemiology of HIV anonymous testing in Switzerland for 1996 – 2006. *Swiss Medical Weekly,* 2009. 139(17 – 18): p. 256 – 63.

[50] Folch, C., Casabona, J., Majó, X., Brugal, T., Meroño, M., González, V., Working group REDAN, Prevalence of HIV , HCV and other sexually transmitted infections and associated risk behaviours among Spanish and immigrant IDU in Catalonia, Spain, in International Harm Reduction Conference. 2010: Liverpool.

[51] Platt, L., et al., Systematic Review examining differences in HIV, sexually transmitted infections and health-related risk behaviours between migrant and indigenous sex workers Draft.

[52] Tampep and L. Brussa, Sex Work In Europe: A mapping of the prostitution scene in 25 countries, in Sex Work, Migration and Health, T. International, Editor. 2009, Tampep International: Amsterdam.

[53] Miller, C.L., et al., Females experiencing sexual and drug vulnerabilities are at elevated risk for HIV risk infection among youth who use injection drugs. *Journal of Acquired Immune Deficiency Syndromes,* 2002. 30: p. 335 – 341.

[54] Montgomery, S.B., et al., Gender differences in HIV risk behaviours among young injectors and their social network members. *American Journal of Drug and Alcohol Abuse,* 2002. 28(3): p. 453 – 475.

[55] Muga, R., et al., Syphilis in injecting drug users: clues for high-risk sexual behaviour in female IDUs. *International Journal of STD & AIDS,* 1997. 8: p. 225 – 228.

[56] Spittal, P.M. and M.T. Schechter, Injection drug use and despair through the lens of gender. *Canadian Medical Association Journal,* 2001. 164: p. 295 – 305.

[57] Tortu, S., et al., Women's drug injection practices in East Harlem: an event analysis in a high-risk community. *AIDS and Behaviour,* 2003. 7: p. 317 – 328.

[58] Tyndall, M.W., et al., Risky sexual behaviours among injection drugs users with high HIV prevalence: implications for STD control. *Sexually Transmitted Infections,* 2002. 78 (Supplement 1)(S170 – S75).

[59] Weber, A.E., et al., HIV Risk Profile and Prostitution Among Female Street Youths. *Journal of Urban Health: Bulletin of the New York Academy of Medicine,* 2002. 79(4): p. 525 – 533.

[60] Booth, R., Dvoryak, S., Anderson, C., John, B., Strathdee, S., Police brutality is independently associated with sharing injection equipment among injection drug users in Odessa, Ukraine, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[61] Sarang, A., et al., Policing Drug Users in Russia: Risk, Fear, and Structural Violence. *Substance Use & Misuse,* 2010. 45(6): p. 813 – 864.

[62] Strathdee, S.A., et al., HIV and risk environment for injecting drug users: the past, present, and future. *The Lancet*, 2010. 376(9737): p. 268 – 284.

[63] Rhodes, T., Sarang, A., Simic, M., Police violence and 'fear-based policy' as barriers to HIV prevention: qualitative case studies in Russia and Serbia, in XVIII International AIDS Conference. 2010: Vienna, Austria.

[64] Rhodes, T., et al., Trust, disruption and responsibility in accounts of injecting equipment sharing and hepatitis C risk. *Health, Risk & Society,* 2008. 10(3): p. 221 – 240.

[65] Rhodes, T., et al., Situational factors influencing drug injecting, risk reduction and syringe exchange in Togliatti City, Russian Federation: a qualitative study of micro risk environment. *Social Science & Medicine,* 2003. 57(1): p. 39 – 54.

[66] Dolan, K., et al., HIV in prison in low-income and middle-income countries. *The Lancet Infectious Diseases*, 2007. 7(1): p. 32 – 41.

[67] Jürgens, R., A. Ball, and A. Verster, Interventions to reduce HIV transmission related to injecting drug use in prison. *The Lancet Infectious Diseases*, 2009. 9(1): p. 57 – 66.

[68] Matteelli, A., et al., Chlamydia trachomatis genital infection in migrant female sex workers in Italy. *International Journal of STD & AIDS,* 2003. 14(9): p. 591 – 5.

[69] Strathdee, S., Health risks and power among female sex workers in Moscow, S. report, Editor. 2005.

[70] Ilić, D., S. Šipetić, and V. Bjegović, Risk of HIV infection among indoor and street sex workers and their use of health services in Belgrade, Serbia. Srpski arhiv za celokupno lekarstvo 2010(3 – 4): p. 219 – 224.

[71] Simic, M. and T. Rhodes, Violence, dignity and HIV vulnerability: street sex work in Serbia. *Sociology of Health & Illness,* 2009. 31(1): p. 1 – 16.

[72] Crago, A.L., Arrest the violence. Human Rights abuses against sex workers in Central and Eastern Europe and Central Asia. 2009, Sex Workers' Rights Advocacy Network in Central and Eastern Europe and Central Asia.

[73] Shannon, K., et al., Mapping violence and policing as an environmental-structural barrier to health service and syringe availability among substance-using women in street-level sex work. *International Journal of Drug Policy,* 2008. 19(2): p. 140 – 7.

[74] Boynton, P. and L. Cusick, Sex workers to pay the price. *BMJ,* 2006. 332(7535): p. 190 – 1.

[75] Boyle, F.M., et al., Psychological distress among female sex workers. *Australian and New Zealand Journal of Public Health,* 1997. 21(6): p. 643 – 646.

[76] Romans, S.E., et al., The mental and physical health of female sex workers: a comparative study. *Australian and New Zealand Journal of Psychiatry,* 2001. 35(1): p. 75 – 80.

[77] International Harm Reduction Development Program, Women, Harm Reduction, and HIV, in Assessment in Action. 2009, Open Society Institute.

[78] Campbell, R. and M. Storr, Challengeing the Kerb Crawler Rehabilitation Programme. Feminist Review, 2001. 67: p. 94 – 108.

[79] Kinnell, H., Violence and Sex Work in Britain. 2008, Cullompton: Willan Publishing. 290.

[80] Chin, J., The AIDS pandemic: the collision of epidemiology with political correctness. 2007, Oxford: Radcliffe Publishing.

[81] Parkhurst, J.O., Understanding the correlations between wealth, poverty and human immunodeficiency virus infection in African countries. *Bulletin of the World Health Organization,* 2010. 88(7): p. 519 – 26.

[82] Shelton, J.D., M.M. Cassell, and J. Adetunji, Is poverty or wealth at the root of HIV? *The Lancet*, 2005. 366(9491): p. 1057 – 8.

[83] Bourgois, P., B. Prince, and A. Moss, The Everyday Violence of Hepatitis C Among Young Women Who Inject Drugs in San Francisco. *Human Organization,* 2004. 63(3): p. 253 – 264.

[84] Rhodes, T., et al., Police violence and sexual risk among female and transvestite sex workers in Serbia: qualitative study. *BMJ,* 2008. 337(7669).

[85] Camara, B., et al., Guidelines for Upgrading of HIV/AIDS/STI Surveillance in the Caribbean, in The Third Generation Surveillance of HIV/AIDS/STI Linking HIV, AIDS and STI Case-Reporting Behavioural and Care surveillance, CAREC, WHO, and PANO, Editors. 2002.

[86] European Centre for Disease Prevention and Control (ECDC), Mapping of HIV/STI behavioural surveillance in Europe, in ECDC TECHNICAL REPORT. 2009: Stockholm.

[87] Public Health England, Shooting up: infections among injecting drug users in the United Kingdom 2010. An update, November 2011, in Shooting up: infections among injecting drug users in the United Kingdom. 2011.

[88] Camoni, L., et al., Continued high prevalence of HIV, HBV and HCV among injecting and noninjecting drug users in Italy. *Annali Dell'Istituto Superiore di Sanita*, 2010. 46(1): p. 59 – 65.

[89] Ongoeva, D., HIV-infection epidemiolgical analysis among sex workers in Central Asia. 2010: Oblast AIDS Centre, Kyrgystan.

[90] Schmidt, A.J., Marcus, U., Mikolaychuk, M., Sekuler, T., Ferrer, L., Folch, C., Hickson, F., Reid, D., Weatherburn, P., Benvenuti, S., Breveglieri, M., Mirandola, M., Hospers, H.J,, EMIS Community Report 1. 2010.

[91] Mounier-Jack, S., S. Nielsen, and R.J. Coker, HIV testing strategies across European countries. HIV Medicine, 2008. 9: p. 13 – 19.

[92] Samet, J.H., Russia and human immunodeficiency virus—beyond crime and punishment. *Addiction,* 2011. 106(11): p. 1883 – 5.

[93] World Health Organisation (WHO), Policy guidelines for collaborative TB and HIV services for injecting and other drug users: an integrated approach, in Evidence for action technical papers. 2008.

[94] Van Den Berg, C., et al., Full participation in harm reduction programmes is associated with decreased risk for human immunodeficiency virus and hepatitis C virus: evidence from the Amsterdam Cohort Studies among drug users. *Addiction,* 2007. 102(9): p. 1454 – 1462.

[95] Roux, P., et al., The impact of methadone or buprenorphine treatment and ongoing injection on highly active antiretroviral therapy (HAART) adherence: evidence from the MANIF2000 cohort study. *Addiction,* 2008. 103(11): p. 1828 – 1836.

[96] Degenhardt L, M.B., Vickerman P, Rhodes T, Latkin C, Hickman M., Prevention of HIV infection for people who inject drugs: why individual, structural, and combination approaches are needed. *The Lancet*, 2010. 376: p. 285 – 301.

[97] Gupta, G.R., et al., Structural approaches to HIV prevention. *The Lancet*, 2008. 372(9640): p. 764 – 75.

[98] Blankenship, K., et al., Structural Interventions: Concepts, Challenges and Opportunities for Research. *Journal of Urban Health,* 2006. 83(1): p. 59 – 72.

[99] Booth, R.E., et al., Interventions with injection drug users in Ukraine. *Addiction,* 2009. 104(11): p. 1864 – 1873.

[100] Latkin, C., A., W. Hua, and V.L. Forman, The relationship between social network characteristics and exchanging sex for drugs or money among drug users in Baltimore, MD, USA. *International Journal of STD & AIDS,* 2003. 14: p. 770 – 775.

[101] Latkin, C.A., et al., The efficacy of a network intervention to reduce HIV risk behaviors among drug users and risk partners in Chiang Mai, Thailand and Philadelphia, USA. *Social Science & Medicine,* 2009. 68(4): p. 740 – 748.

[102] Hammett, et al., Patterns of hiv prevalence and hiv risk behaviors among injection drug users prior to and 24 months following implementation of cross-border HIV prevention interventions in northern Vietnam and southern China. Vol. 18. 2006, New York, NY, ETATS-UNIS: Guilford. 19.

[103] Medley, A., Kennedy, C., O'Reilly, K., Sweat, M., Effectiveness of peer education interventions for HIV prevention in developing countries: a systematic review and meta-analysis. *AIDS Education and Prevention*, 2009. 21(3): p. 181 – 206.

[104] Irwin, K., et al., Secondary Syringe Exchange as a Model for HIV Prevention Programs in the Russian Federation. *Substance Use & Misuse,* 2006. 41(6 – 7): p. 979 – 999.

[105] Bryant, J. and M. Hopwood, Secondary exchange of sterile injecting equipment in a high distribution environment: A mixed method analysis in south east Sydney, Australia. *International Journal of Drug Policy,* 2009. 20(4): p. 324 – 328.

[106] Des Jarlais, D.C., et al., Doing harm reduction better: syringe exchange in the United States. *Addiction,* 2009. 104(9): p. 1441 – 1446.

[107] Kerr, T., et al., The role of safer injection facilities in the response to HIV/AIDS among injection drug users. Current HIV/AIDS Reports, 2007. 4(4): p. 158 – 164.

[108] Hedrich, D., European report on drug consumption rooms. 2004, European Monitoring Centre for Drugs and Drug Addiction (EMCDDA).

[109] Hedrich, D., Kerr, T., Dubois-Arber, F., Drug consumption facilities in Europe and beyond, in Harm Reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor. 2010, Publications Office of the European Union: Luxembourg.

[110] MISC Evaluation Committee, Final report of the evaluation of the Sydney Medically Supervised Injecting Centre. 2003.

[111] Room, R., The ambiguity of harm reduction – goal or means, and what constitutes harm?, in Harm reduction: evidence, impacts and challenges, T. Rhodes, Hedrich, D., Editor. 2010, Publications Office of the European Union: Luxembourg. p. 108.

[112] Wood, E., et al., Do Supervised Injecting Facilities Attract Higher-Risk Injection Drug Users? *American Journal of Preventive Medicine,* 2005. 29(2): p. 126 – 130.

[113] Wood, E., et al., Service Uptake and Characteristics of Injection Drug Users Utilizing North America's First Medically Supervised Safer Injecting Facility. *American Journal of Public Health,* 2006. 96(5): p. 770 – 773.

[114] Benninghoff, F., Geense, R., Dubois-Arber, F., Resultats de l'étude 'La clientèle des structures à bas seuil d'accessibilité en Suisse'. 2001, Institut universitaire de médecine sociale et préventitive: Lausanne.

[115] Benninghoff, F., Solai, S., Huissoud, T., Dubois-Arber, F., Evaluation de Quai 9 'Espace d'acceuil et d'injection' à Genéve: période 12/2001–12/2000. 2003, Institut universitaire de médecine sociale et préventive.: Lausanne.

[116] Benninghoff, F., Dubois-Arber, F., Résultats de l'étude de la clientèle du Cactus BIEL/BIENNE 2001. 2002, Institut universitaire de médecine sociale et préventive.: Lausanne.

[117] Solai, S., Benninghoff, F., Meystre-Agustoni, G., Jeannin, A., Dubois-Arber, F., EVALUATION DE L'ESPACE D'ACCUEIL ET D'INJECTION" QUAI 9" À GENÈVE Deuxième phase 2003. 2003, Institut universitaire de médecine sociale et préventive: Lausanne.

[118] Bravo, M.J., et al., Use of supervised injection facilities and injection risk behaviours among young drug injectors. *Addiction,* 2009. 104(4): p. 614 – 619.

[119] Poschadel, S., Höger, R., Schnitzler, J., Schreckenberger, Evaluation der Arbeit der Drogenknsomräume in der Bundesrepublik Deutschland: Endbericht imAuftrag des Bundesminiteriums für Gesundheit, Das Bundesminiteriums für Gesundheit und Soziale Sicherung (Schriftenriehe Bd 149). 2003, Nomos-Verlags-Gelleschaft: Baden-Baden.

[120] Kimber, J., et al., Process and predictors of drug treatment referral and referral uptake at the Sydney Medically Supervised Injecting Centre. *Drug and Alcohol Review,* 2008. 27(6): p. 602 – 612.

[121] Wood, E., et al., Rate of detoxification service use and its impact among a cohort of supervised injecting facility users. *Addiction,* 2007. 102(6): p. 916 – 919.

[122] Ball, A.L., HIV, injecting drug use and harm reduction: a public health response. *Addiction,* 2007. 102(5): p. 684 – 690.

[123] Friedman, S.R., et al., Relationships of deterrence and law enforcement to drug-related harms among drug injectors in US metropolitan areas. *AIDS,* 2006. 20(1): p. 93 – 9.

[124] Hurley, S.F., D.J. Jolley, and J.M. Kaldor, Effectiveness of needle-exchange programmes for prevention of HIV infection. *The Lancet*, 1997. 349(9068): p. 1797 – 1800.

[125] Wiessing, L., et al., Associations Between Availability and Coverage of HIV-Prevention Measures and Subsequent Incidence of Diagnosed HIV Infection Among Injection Drug Users. *American Journal of Public Health,* 2009. 99(6): p. 1049 – 1052.

[126] Cooper, H., et al., The impact of a police drug crackdown on drug injectors' ability to practice harm reduction: A qualitative study. *Social Science & Medicine,* 2005. 61(3): p. 673 – 684.

[127] Pollini, R.A., et al., Syringe possession arrests are associated with receptive syringe sharing in two Mexico–US border cities. *Addiction,* 2008. 103(1): p. 101 – 108.

[128] Rhodes, T., et al., Injecting Equipment Sharing Among Injecting Drug Users in Togliatti City, Russian Federation: Maximizing the Protective Effects of Syringe Distribution. *Journal of Acquired Immune Deficiency Syndromes,* 2004. 35(3): p. 293 – 300.

[129] Skala, P., Criminalization of drug users in Ukraine as a factor hindering the scale up of access to HIV/AIDS prevention and treatment programmes, in XVIII International AIDS Conference 2010: Vienna, Austria.

[130] Wolfe, D., M.P. Carrieri, and D. Shepard, Treatment and care for injecting drug users with HIV infection: a review of barriers and ways forward. *The Lancet*, 2010. 376(9738): p. 355 – 366.

[131] Reuter, P., Ten years after the United Nations General Assembly Special Session (UNGASS): assessing drug problems, policies and reform proposals. *Addiction,* 2009. 104(4): p. 510 – 7.

[132] Degenhardt, L., et al., Toward a global view of alcohol, tobacco, cannabis, and cocaine use: findings from the WHO World Mental Health Surveys. *PLoS Med,* 2008. 5(7): p. e141.

[133] Wood, E., et al., Vienna Declaration: a call for evidence-based drug policies. *The Lancet*, 2010. 376(9738): p. 310 – 2.

[134] Wood, E., et al., The war on drugs: a devastating public-policy disaster. *The Lancet*, 2009. 373(9668): p. 989 – 90.

[135] Aral, S., O., et al., The social organization of commercial sex work in Moscow, Russia. *Sexually Transmitted Diseases,* 2003. 30(1): p. 39 – 45.

[136] Central and Eastern European Harm Reduction Network, Sex work, HIV / AIDS, and human rights in Central and Eastern Europe and Central Asia. A report from the Central and Eastern European Harm Reduction Network. 2005: Vilnius, Lithuania, CEEHRN, 2005 Jul. 119.

[137] Surratt, H.L. and J.A. Inciardi, An effective HIV risk-reduction protocol for drug-using female sex workers. J Prev Interv Community, 2010. 38(2): p. 118 – 31.

[138] Cusick, L., Widening the harm reduction agenda: From drug use to sex work. *International Journal of Drug Policy,* 2006. 17(1): p. 3 – 11.

[139] Rekart, M.L., Sex-work harm reduction. *The Lancet*, 2005. 366: p. 2123 – 2134.

[140] Campbell, J.C., Health consequences of intimate partner violence. *The Lancet*, 2002. 359(9314): p. 1331 – 6.

[141] Dunkle, K.L., et al., Gender-based violence, relationship power, and risk of HIV infection in women attending antenatal clinics in South Africa. *The Lancet*, 2004. 363(9419): p. 1415 – 21.

[142] Shannon, K., et al., Prevalence and structural correlates of gender based violence among a prospective cohort of female sex workers. *BMJ,* 2009. 339: p. b2939.

[143] Shannon, K., et al., Structural and environmental barriers to condom use negotiation with clients among female sex workers: implications for HIV-prevention strategies and policy. *American Journal of Public Health,* 2009. 99(4): p. 659 – 65.

[144] Watts, C. and C. Zimmerman, Violence against women: global scope and magnitude. *The Lancet*, 2002. 359(6): p. 1232 – 37.

[145] Goodyear, M.D. and L. Cusick, Protection of sex workers. *BMJ,* 2007. 334(7584): p. 52 – 3.

[146] UNAIDS Advisory Group on HIV and Sex Work, The report of the UNAIDS Advisory Group on HIV and Sex Work. 2011, UNAIDS.

[147] Sexton, S., Over the Parapet: a short study into the needs and aspirations of sex workers in Edinbrugh, SCOT-PEP, Editor. 2009: Edinburgh.

[148] Boyle, F.M., et al., Psychological distress among female sex workers. *Australian and New Zealand Journal of Public Health,* 1997. 21(6): p. 643 – 6.

[149] Romans, S.E., et al., The mental and physical health of female sex workers: a comparative study. *Australian and New Zealand Journal of Psychiatry,* 2001. 35: p. 75 – 80.

[150] Seib, C., J. Fischer, and J.M. Najman, The health of female sex workers from three industry sectors in Queensland, *Australia. Social Science and Medicine,* 2009. 68(3): p. 473 – 8.

[151] Oberzaucher, N., HIV and sexually transmitted infection prevention among sex workers in Eastern Europe and Central Asia. UNAIDS Best Practice Collection;UNAIDS/06.10E. 2006, Geneva, Switzerland: Joint United Nations Programme on HIV / AIDS [UNAIDS], 2006 May. 63.

[152] Costenbader, E., Otiashvili, D., Meyer, W., Zule, W., Orr, A., Kirtadze, I., Secrecy and risk among MSM in Tbilisi, Georgia. *AIDS Care,* 2009. 21: p. 591 – 597.

[153] Peryshkina, A., Kizub, D., Deobald, I., Moguilnyi, V., Masenior, N., Wirtz, A., Kostetskaya, I., Sifakis, F., Beyrer, C. Men who have sex with men (MSM), physicians, and non-government organizations (NGOs): finding agreement on the HIV risk environment and service provision for MSM in Russia. in International AIDS Conference 2010. 2010. Vienna.

[154] Rainbow Project, Through Our Eyes—experiences of Lesbian, Gay and Bisexual people in the Workplace. 2011.

[155] Csepe, P., et al., HIV risk behaviour among gay and bisexual men in Budapest, Hungary. *International Journal of STD & AIDS,* 2002. 13(3): p. 192 – 200.

[156] Štulhofer, A., et al., HIV-related Sexual Risk Taking Among HIV-negative Men Who Have Sex with Men in Zagreb, Croatia. *AIDS and Behavior,* 2008. 12(3): p. 505 – 512.

[157] Kizub, D., Deobald, I., Masenior, N., Peryshkina, A., Wirtz, A., Kostetskaya, I., Sifakis, F., Beyrer, C. , Advocating for HIV and STI Prevention Services and Strengthening the Advocacy Capacity of Groups Representing Men Who Have Sex with Men in the Russian Federation: Study of the Needs of Men who Have Sex with Men with Respect to HIV and STI Prevention and Medical Care in Russia. 2009, AIDS Infoshare: Moscow.

[158] Reynolds, L., et al., HIV among men who have sex with men in Central and eastern Europe: A review of 30 countries, WHO, Editor. 2011, WHO.

[159] Bourne, A.D., C.; Keogh, P.; Weatherburn, P.; Hammond, G., Relative safety II: risk and unprotected anal intercourse among gay men with diagnosed HIV. 2009 Sigma Research: London.

[160] Kippax, S., et al., Sexual negotiation in the AIDS era: negotiated safety revisited. *AIDS,* 1997. 11(2): p. 191 – 197.

[161] Parsons, J.T., et al., Sexual harm reduction practices of HIV-seropositive gay and bisexual men: serosorting, strategic positioning, and withdrawal before ejaculation. *AIDS*, 2005. 19: p. S13 – S25.

[162] van Kesteren, N.M.C., H.J. Hospers, and G. Kok, Sexual risk behavior among HIV-positive men who have sex with men: A literature review. *Patient Education and Counseling,* 2007. 65(1): p. 5 – 20.

[163] Folch, et al., Factors associated with unprotected sexual intercourse with steady male, casual male, and female partners among men who have sex with men in Barcelona, Spain. Vol. 18. 2006, New York, NY, ETATS-UNIS: Guilford. 16.

[164] Choi, K.H., E.S. Hudes, and W.T. Steward, Social discrimination, concurrent sexual partnerships, and HIV risk among men who have sex with men in Shanghai, China. *AIDS and Behavior,* 2008. 12(4 Suppl): p. S71 – 7.

[165] Morris, M. and M. Kretzschmar, Concurrent partnerships and the spread of HIV. *AIDS*, 1997. 11(5): p. 641 – 8.

[166] European Men's Internet Survey (EMIS). www.emis-project.eu. [cited].

[167] UNAIDS, An introduction to indicators: UNAIDS monitoring and evaluation fundamentals. 2010.

[168] Mirandola, M., et al., HIV bio-behavioural survey among men who have sex with men in Barcelona, Bratislava, Bucharest, Ljubljana, Prague and Verona, 2008 – 2009. (Special Issue: HIV/AIDS and other sexually transmitted infections (STI) in men who have sex with men (MSM)—trends and behavioural surveillance.). *Eurosurveillance*, 2009. 14(48): p. 19427.

[169] Williamson, L.M., et al., HIV testing trends among gay men in Scotland, United Kingdom (1996–2005): implications for HIV testing policies and prevention. *Sexually Transmitted Infections,* 2009. 85(7): p. 550 – 554.

[170] Granich, R.M., et al., Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: a mathematical model. *The Lancet*, 2009. 373(9657): p. 48 – 57.

[171] Montaner, J.S.G., et al., Association of highly active antiretroviral therapy coverage, population viral load, and yearly new HIV diagnoses in British Columbia, Canada: a population-based study. *The Lancet*, 2010. 376(9740): p. 532 – 539.

[172] Vanable, P.A., et al., Impact of Combination Therapies on HIV Risk Perceptions and Sexual Risk Among HIV-Positive and HIV-Negative Gay and Bisexual Men. *Health Psychology*, 2000. 19(2): p. 134 – 145.

[173] Cohen, M., The HIV 'test and treat' movement: the details really matter, and now, in BHIVA Autumn Conference. 2010: London.

[174] Cohen, M.S., HIV Treatment as Prevention: To be or not to be? *Journal of Acquired Immune Deficiency Syndromes,* 2010. 55(2): p. 137 – 138 10.1097/QAI.0b013e3181f0cbf3.

[175] Cohen, M.S., HIV Treatment as Prevention: In the Real World the Details Matter. *Journal of Acquired Immune Deficiency Syndromes,* 2011. 56(3): p. e101 – e102 10.1097/QAI.0b013e3182041968.

[176] Montaner, J.S.G., et al., The case for expanding access to highly active antiretroviral therapy to curb the growth of the HIV epidemic. *The Lancet*, 2006. 368(9534): p. 531 – 536.

[177] Wang, L., et al., HIV Transmission Risk Among Serodiscordant Couples: A Retrospective Study of Former Plasma Donors in Henan, China. *Journal of Acquired Immune Deficiency Syndromes,* 2010. 55(2): p. 232 – 238 10.1097/QAI.0b013e3181e9b6b7.

[178] Jin, F., et al., Unprotected anal intercourse, risk reduction behaviours, and subsequent HIV infection in a cohort of homosexual men. AIDS, 2009. 23(2): p. 243 – 252 10.1097/QAD.0b013e32831fb51a.

[179] Boily, M.-C., et al., Heterosexual risk of HIV-1 infection per sexual act: systematic review and meta-analysis of observational studies. *The Lancet Infectious Diseases*, 2009. 9(2): p. 118 – 129.

[180] Goodreau, S.M., et al., Role versatility among men who have sex with men in urban Peru. *Journal of Sex Research,* 2007. 44(3): p. 233 – 9.

[181] UNAIDS, AIDS and men who have sex with men, in UNAIDS Best Practice Collection 2000, UNAIDS.

[182] Aidala, A., et al., Housing status and HIV risk behaviors: implications for prevention and policy. *AIDS and Behavior*, 2005. 9(3): p. 251 – 65.

[183] Basu, I., et al., HIV prevention among sex workers in India. *Journal of Acquired Immune Deficiency Syndromes,* 2004. 36(3): p. 845 – 52.

[184] Swendeman, D., et al., Empowering sex workers in India to reduce vulnerability to HIV and sexually transmitted diseases. *Social Science & Medicine,* 2009. 69(8): p. 1157 – 66.

[185] Dworkin, S.L. and K. Blankenship, Microfinance and HIV/AIDS prevention: assessing its promise and limitations. *AIDS and Behavior,* 2009. 13(3): p. 462 – 9.

[186] Pronyk, P.M., et al., Effect of a structural intervention for the prevention of intimate-partner violence and HIV in rural South Africa: a cluster randomised trial. *The Lancet*, 2006. 368(9551): p. 1973 – 1983.

[187] Hargreaves, J.R., et al., Systematic review exploring time trends in the association between educational attainment and risk of HIV infection in sub-Saharan Africa. *AIDS*, 2008. 22(3): p. 403 – 414 10.1097/QAD.0b013e3282f2aac3.

Appendix 1.A.1
Systematic Review Detailed Search Strategy

People who inject drugs

188. HIV

Keywords:
HIV *OR* (human immunodeficiency virus) *OR* (acquired immunodeficiency syndrome) *OR* (acquired immune deficiency syndrome)

OR

Subject headings:
exp HIV/ *OR* exp HIV infections/

189. Epidemiological terms

a. Prevalence and incidence
Keywords:
Prevalen* *OR* incidence
OR

Subject headings:
Prevalence/ *OR* Incidence/

b. Risk factors for acquiring HIV infection
Keywords:
risk* *OR* correlat* *OR* determinant* *OR* vulnerab* *OR* regression *OR* risk *OR* (enhanc* adj3 transmission) *OR* multivariate *OR* (route* adj3 transmission) *OR* (factor* adj3 transmission) *OR* (social norm*) *OR* network *OR* socio-demographic *OR* socio-economic *OR* lifestyle *OR* epidemiol*
OR

Subject headings
exp Risk/ *OR* Factor Analysis, Statistical/ *OR* exp Regression analysis/ *OR* exp Risk Factors/ *OR* exp Risk-Taking *OR* exp Epidemiology

190. Countries

All countries in the Europe region as defined by WHO:
Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, United Kingdom of Great Britain and Northern Ireland and Uzbekistan.

a. Europe
Basic grouping, derived from Medline subject schema:
Keyword search string (to include adjectives as well as nouns for countries):
Europe* *OR* Albania* *OR* Andorra* *OR* Armenia* *OR* Austria* *OR* Azerbaijan* *OR* Bel#rus *OR* Byel#rus* *OR* Belgium *OR* Belgian *OR* Bosnia* *OR* Herzegovin* *OR* Bulgaria* *OR* Croatia* *OR* Cypr* *OR* Czech* *OR* Denmark *OR* Danish *OR* Estonia* *OR* Finland *OR* Finnish *OR* France *OR* French *OR* Georgia* *OR* German* *OR* Greece *OR* Greek *OR* Hungary *OR* Hungarian *OR* Iceland* *OR* Ireland *OR* Irish *OR* Israel* *OR* Italy *OR* Italian *OR* Kosovo *OR* Latvia* *OR* Lithuania* *OR* Luxembourg* *OR* Malta *OR* Maltese *OR* Monaco *OR* Montenegr* *OR* Netherland* *OR* Dutch *OR* Norway *OR* Norwegian *OR* Poland *OR* Polish *OR* Portugal *OR* Portuguese *OR* Moldova* *OR* Romania* *OR* Russia* *OR* USSR *OR* CIS *OR* Marino *OR* Serbia* *OR* Slovakia* *OR* Slovenia* *OR* Spain *OR* Spanish *OR* Sweden *OR* Swedish *OR* Switzerland *OR* Swiss *OR* Macedonia* *OR* Transdniestria* *OR* Trans-Dniester* *OR* Transnistria* *OR* Turkey *OR* Turkish *OR* Ukrain* *OR* United Kingdom *OR* Britain *OR* British *OR* English *OR* England *OR* Scotland *OR* Scottish *OR* Wales *OR* Welsh *OR* Baltic* *OR* Balkan* *OR* Kosov* *OR* Dagestan* *OR* Chech?n* *OR* Ingush*

Subject heading search string:
Exp Europe/

b. Central Asia
Keyword search string (to include adjectives as well as nouns for countries):
Kazakh* *OR* Kyrg?#z* *OR* Kirg?#z *OR* Tajik* *OR* Turkmen* *OR* Uzbek*

Subject heading search string:
exp Asia, Central/

191. Risk Group

Keywords:
IDU* *OR* inject* *OR* intravenous *OR* heroin *OR* addict* *OR* opiate* *OR* narco* *OR* psychotropic* *OR* psychoactive* *OR* (drug depend#n*) *OR* (recreation* adj3 drug*) *OR* (harm reduction) *OR* syringe* *OR* methadone *OR* opioid* *OR* syringe* *OR* (needle* adj3 shar*) *OR* (illegal* adj3 drug*)

Subject headings:
exp Substance Abuse, Intravenous/ *OR* exp Needle Sharing/ *OR* exp Heroin Dependence/

Sex workers

1. HIV

Keywords:
HIV *OR* (human immunodeficiency virus) *OR* (acquired immunodeficiency syndrome) *OR* (acquired immune deficiency syndrome)

OR

Chlamydia Trachomatis *OR* Chlamydia *OR* C Trachomatis *OR* Treponema Pallidum *OR* T Pallidum *OR* syphilis *OR* Neisseria gonorrhoea *OR* N gonorrhoea *OR* Gonorrhoea *OR* Trichomonas vaginalis *OR* T vaginalis *OR* trichmoniasis

Subject headings:
exp HIV/ *OR* exp HIV infections/ Sexually Transmitted Diseases/ or Gonorrhea/ or Risk Factors/ or Chlamydia Infections/

2. Epidemiological terms

a. Prevalence and incidence
Keywords:
Prevalence* *OR* incidence

OR

Subject headings:
Prevalence/ *OR* Incidence/

b. Risk factors for acquiring HIV infection
Keywords:
risk* *OR* correlat* *OR* determinant* *OR* vulnerab* *OR* regression *OR* risk *OR* (enhanc* adj3 transmission) *OR* multivariate *OR* (route* adj3 transmission) *OR* (factor* adj3 transmission) *OR* (social norm*) *OR* network *OR* socio-demographic *OR* socio-economic *OR* lifestyle *OR* epidemiol*

OR

Subject headings
exp Risk/ *OR* Factor Analysis, Statistical/ *OR* exp Regression analysis/ *OR* exp Risk Factors/ *OR* exp Risk-Taking *OR* exp Epidemiology

3. Countries

All countries in the Europe region as defined by WHO:
Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, United Kingdom of Great Britain and Northern Ireland and Uzbekistan.

a. Europe
Keyword search string (to include adjectives as well as nouns for countries):
Europe* *OR* Albania* *OR* Andorra* *OR* Armenia* *OR* Austria* *OR* Azerbaijan* *OR* Bel#rus *OR* Byel#rus* *OR* Belgium *OR* Belgian *OR* Bosnia* *OR* Herzegovin* *OR* Bulgaria* *OR* Croatia* *OR* Cypr* *OR* Czech* *OR* Denmark *OR* Danish *OR* Estonia* *OR* Finland *OR* Finnish *OR* France *OR* French *OR* Georgia* *OR* German* *OR* Greece *OR* Greek *OR* Hungary *OR* Hungarian *OR* Iceland* *OR* Ireland *OR* Irish *OR* Israel* *OR* Italy *OR* Italian *OR* Kosovo *OR* Latvia* *OR* Lithuania* *OR* Luxembourg* *OR* Malta *OR* Maltese *OR* Monaco *OR* Montenegr* *OR* Netherland* *OR* Dutch *OR* Norway *OR* Norwegian *OR* Poland *OR* Polish *OR* Portugal *OR* Portuguese *OR* Moldova* *OR* Romania* *OR* Russia* *OR* USSR *OR* CIS *OR* Marino *OR* Serbia* *OR* Slovakia* *OR* Slovenia* *OR* Spain *OR* Spanish *OR* Sweden *OR* Swedish *OR*

Switzerland *OR* Swiss *OR* Macedonia* *OR* Transdniestria* *OR* Trans-Dniester* *OR* Trans-nistria* *OR* Turkey *OR* Turkish *OR* Ukrain* *OR* United Kingdom *OR* Britain *OR* British *OR* English *OR* England *OR* Scotland *OR* Scottish *OR* Wales *OR* Welsh *OR* Baltic* *OR* Balkan* *OR* Kosov* *OR* Dagestan* *OR* Chech?n* *OR* Ingush*

Subject heading search string:
exp Europe/

b. Central Asia
Keyword search string (to include adjectives as well as nouns for countries):
Kazakh* *OR* Kyrg?#z* *OR* Kirg?#z *OR* Tajik* *OR* Turkmen* *OR* Uzbek*

Subject heading search string:
exp Asia, Central/

4. Risk Group

Keywords:
(sex work*) *OR* prostitut* *OR* (entertainment worker*) *OR* (exchang* adj3 sex) *OR* (sell* adj3 sex) *OR* (sold* adj3 sex) *OR* (sex adj3 money) *OR* (transaction* adj3 sex) *OR* (commerc adj3 sex) *OR* (surviv* adj3 sex) *OR* (sex adj3 drug*) *OR* (sex trade) *OR* (sex industry) *OR* (sex* servic*) *OR* brothel* *OR* (red-light) *OR* solicit* *OR* (bar girl*) *OR* hostess* *OR* escort* *OR* masseu*

Subject headings:
exp Prostitution/

Men who have sex with Men

1. HIV

Keywords:
HIV *OR* (human immunodeficiency virus) *OR* (acquired immunodeficiency syndrome) *OR* (acquired immune deficiency syndrome)

OR

Subject headings:
exp HIV/ *OR* exp HIV infections/

2. Epidemiological terms

a. Prevalence and incidence
Keywords:
Prevalen* *OR* incidence

OR

Subject headings:
Prevalence/ *OR* Incidence/

b. Risk factors for acquiring HIV infection
Keywords:
risk* *OR* correlat* *OR* determinant* *OR* vulnerab* *OR* regression *OR* risk *OR* (enhanc* adj3 transmission) *OR* multivariate *OR* (route* adj3 transmission) *OR* (factor* adj3 transmission) *OR* (social norm*) *OR* network *OR* socio-demographic *OR* socio-economic *OR* lifestyle *OR* epidemiol*

OR

Subject headings:
exp Risk/ *OR* Factor Analysis, Statistical/ *OR* exp Regression analysis/ *OR* exp Risk Factors/ *OR* exp Risk-Taking *OR* exp Epidemiology

3. Countries

All countries in the Europe region as defined by WHO:
Albania, Andorra, Armenia, Austria, Azerbaijan, Belarus, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Malta, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, United Kingdom of Great Britain and Northern Ireland and Uzbekistan.

a. Europe
Keyword search string (to include adjectives as well as nouns for countries):
Europe* *OR* Albania* *OR* Andorra* *OR* Armenia* *OR* Austria* *OR* Azerbaijan* *OR* Bel#rus *OR* Byel#rus* *OR* Belgium *OR* Belgian *OR* Bosnia* *OR* Herzegovin* *OR* Bulgaria* *OR* Croatia* *OR* Cypr* *OR* Czech* *OR* Denmark *OR* Danish *OR* Estonia* *OR* Finland *OR* Finnish *OR* France *OR* French *OR* Georgia* *OR* German* *OR* Greece *OR* Greek *OR* Hungary *OR* Hungarian *OR* Iceland* *OR* Ireland *OR* Irish *OR* Israel* *OR* Italy *OR* Italian *OR* Kosovo *OR* Latvia* *OR* Lithuania* *OR* Luxembourg* *OR* Malta *OR* Maltese *OR* Monaco *OR* Montenegr* *OR* Netherland* *OR* Dutch *OR* Norway *OR* Norwegian *OR* Poland *OR* Polish *OR* Portugal *OR* Portuguese *OR* Moldova* *OR* Romania* *OR* Russia* *OR* USSR *OR* CIS *OR* Marino *OR* Serbia* *OR* Slovakia* *OR* Slovenia* *OR* Spain *OR* Spanish *OR* Sweden *OR* Swedish *OR* Switzerland *OR* Swiss *OR* Macedonia* *OR* Transdniestria* *OR* Trans-Dniester* *OR* Transnistria* *OR* Turkey *OR* Turkish *OR* Ukrain* *OR* United Kingdom *OR* Britain *OR* British *OR* English *OR* England *OR* Scotland *OR* Scottish *OR* Wales *OR* Welsh *OR* Baltic* *OR* Balkan* *OR* Kosov* *OR* Dagestan* *OR* Chech?n* *OR* Ingush*

Subject heading search string:
Exp Europe/

b. Central Asia
Keyword search string (to include adjectives as well as nouns for countries):
Kazakh* *OR* Kyrg?#z* *OR* Kirg?#z *OR* Tajik* *OR* Turkmen* *OR* Uzbek*

Subject heading search string:
exp Asia, Central/

4. Risk Group

Keywords:
Homosexual* *OR* gay* *OR* bisexual* *OR* (men who have sex with men) *OR* (male adj3 prostitut*) *OR* (male adj3 (sex worker)) *OR* (transgender*) *OR* (transsexual*) *OR* transvestit* *OR* LGBT *OR* (sexual minorit*)

Subject headings
exp Homosexuality, Male/ *OR* exp Homosexuality/

Grey Literature

Internet sites searched for grey literature—general

http://www.aids2006.org/
http://www.aids2008.org/
http://www.aids2010.org/
http://www.ihra.net/
http://www.euro.who.int/en/home
http://www.unaids.org
http://ecdc.europa.eu/en/Pages/home.aspx
http://www.soros.org/
http://www.usaid.gov/km/
http://www.eurohiv.org/
http://www.fhi.org/en/HIVAIDS/pub/index.htm
http://www.harm-reduction.org
http://www.afew.org
http://www.dfid.gov.uk/Media-Room/Publications/?t=HA
http://www.epinorth.org/eway/default.aspx?pid=230&trg=4148&MainArea_5260=5328:0:&4148=5326:2:0
http://www.episouth.org/relevant_links_docs.html
http://europa.eu.int
http://www.szu.cz
http://www.iph.fgov.be/reitox/
http://www.sst.dk/
http://www.stakes.fi/
http://www.ift.de/
http://www.dimdi.de/
http://www.gbe-bund.de/
http://www.asl.bergamo.it
http://www.hrb.ie
http://www.inef.ie
http://www.hrb.ie/ndc
http://www.fhinst.se/

Internet sites searched for grey literature—PWID specific

http://www.emcdda.europa.eu/
http://eusk.tai.ee/?lang=en
http://www.europad.org/europeanpartnerlinks.asp
http://www.univie.ac.at
http://www.beldrug.org
http://www.kaapeli.fi/nad/
http://www.terveysportti.fi/pls/kotisivut
http://www.drogues.gouv.fr
http://www.bisdro.uni-bremen.de/
http://www.indro-online.de

http://www.dgsuchtmedizin.de
http://business.hol.gr/~umhri/
http://www.sitd.org
http://www.relis.lu/
http://www.trimbos.nl/
http://www.frw.uva.nl/cedro/Welcome.html
http://www.ivo.nl/
http://www.aiar.nl
http://www.rusinfo.no
http://www.med.uio.no/ipsy/skr/
http://www.rusmiddeletaten.oslo.kommune.no
http://www.ipdt.pt/
http://www.addiction.ie
http://www.seea.net/about-seea
http://www.mir.es/pnd/index.htm
http://www.fad.es/
http://www.idea-prevencion.com/
http://www.ieanet.com
http://www.socidrogalcohol.org
http://www.can.se
http://www.sfa-ispa.ch
http://www.isf.unizh.ch
http://www.abbeycarefoundation.com
http://www.sdf.org.uk
http://www.dundee.ac.uk
http://www.drugscope.org.uk
http://www.lau.org.uk
http://www.addiction-ssa.org
http://www.gla.ac.uk/Inter/DrugMisuse/
http://www.iop.kcl.ac.uk
http://www.smmgp.co.uk
http://www.staplefordcentre.co.uk
http://www.qed.org.uk
http://www.itacaeurope.org
http://www.erit.org/
http://www.q4q.nl/methwork/
http://www.elisad.org
http://www.pompidou.coe.int/
http://www.ecdp.net
http://www.ac-company.org
http://www.irefrea.org

Internet sites searched for grey literature—Sex worker specific

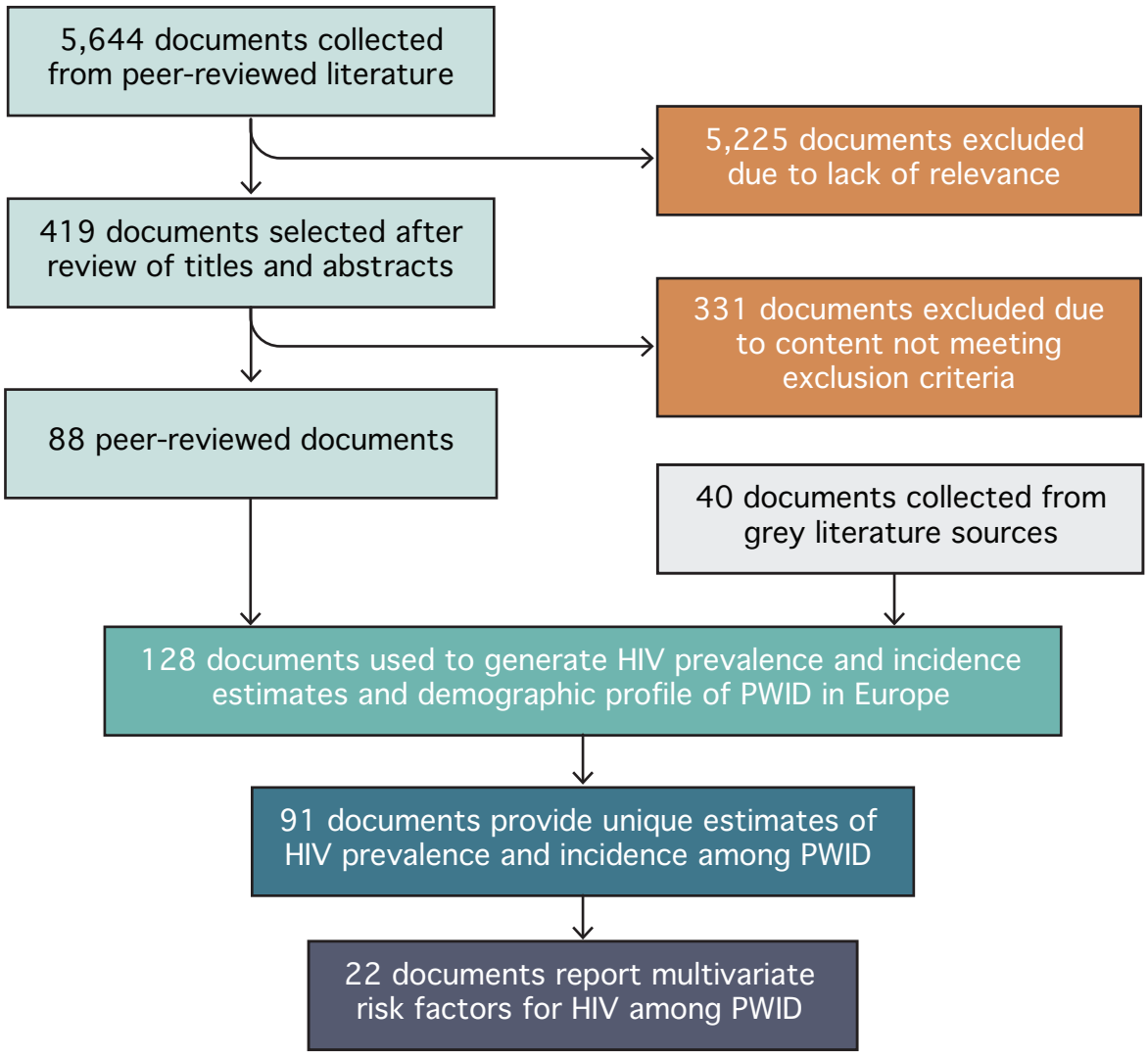
http://tampep.eu/
http://www.nswp.org/
http://www.uknswp.org/

Internet sites searched for grey literature—MSM specific

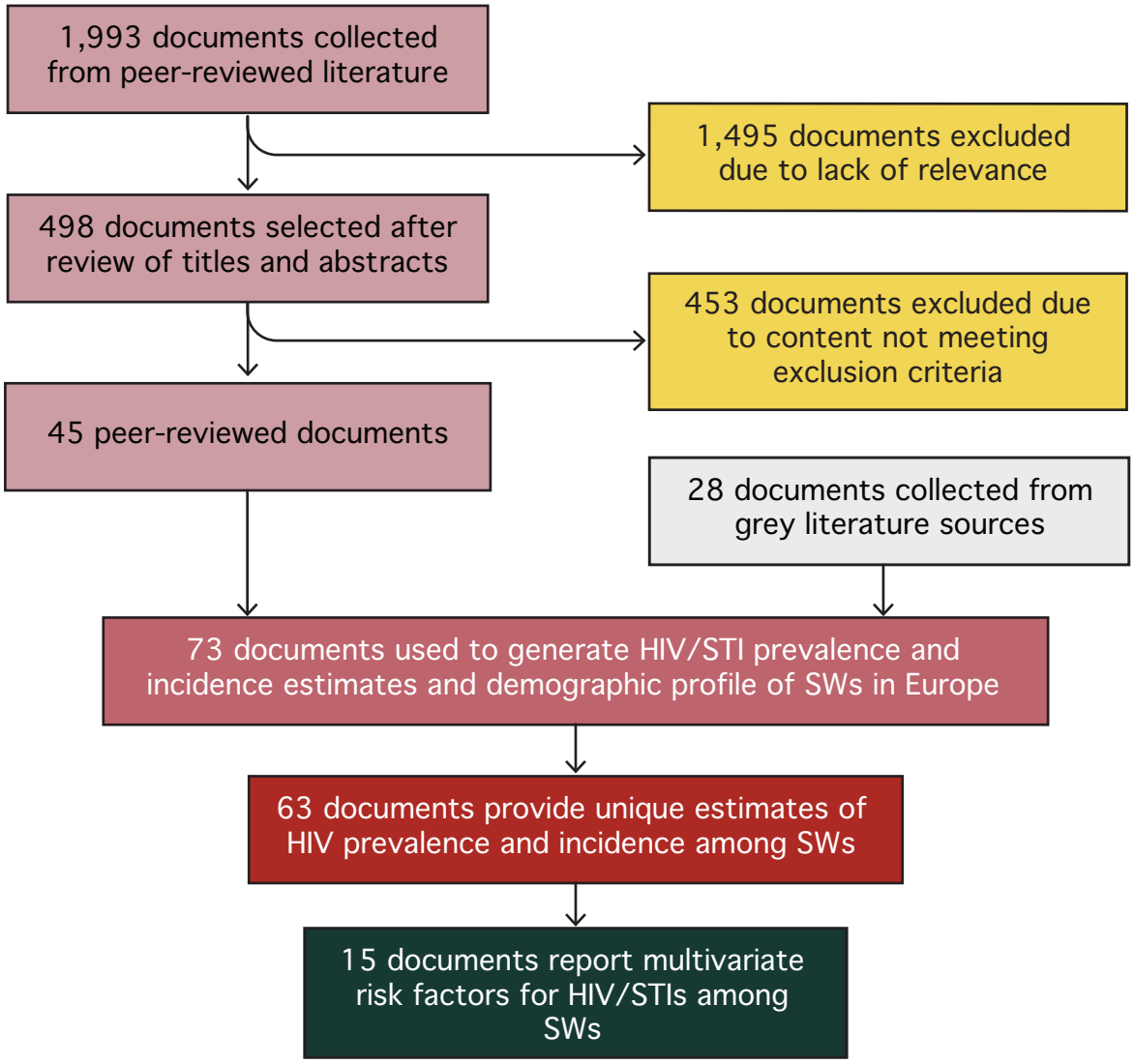
www.gnpplus.net
www.aidsinfoonline.org
www.pridelife.co.uk
www.emis-project.eu
www.ilga-europe.org
www.non-discrimination.net
http://www.rki.de/EN/Home/homepage__node.html

Appendix 1.A.2
Study Selection Flowcharts

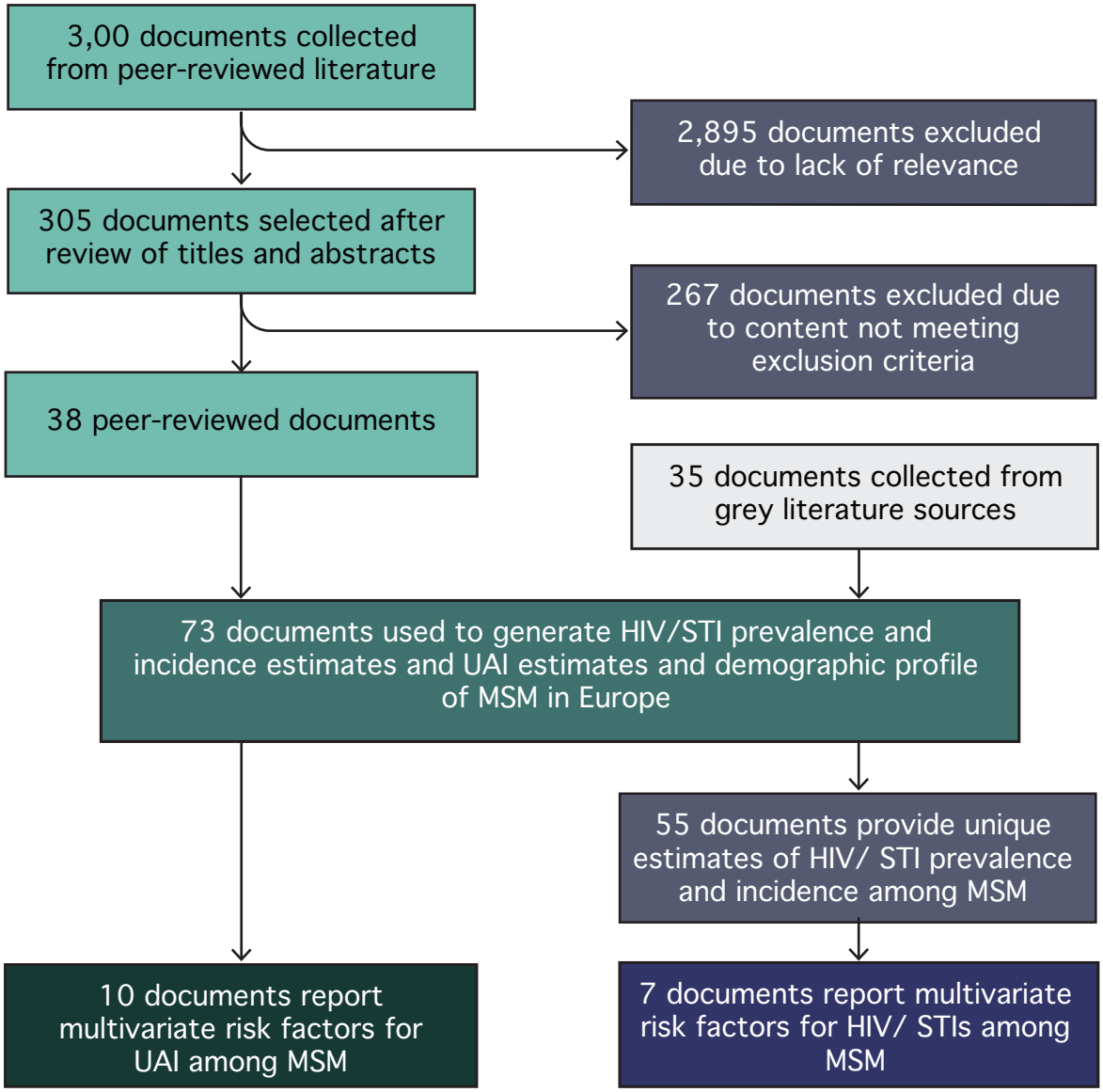
Appendix 1.A.2 Figure 1 Flowchart of study selection of PWID



Appendix 1.A.2 Figure 2 Flowchart of study selection of SWs



Appendix 1.A.2 Figure 3 Flowchart of study selection of MSM



Appendix 1.A.3
Key indicators of an enabling environment for PWID

	MEANINGFUL ENGAGEMENT OF STAKEHOLDERS
1.	The meaningful involvement of PWID in policies affecting their health and welfare and in related HIV prevention programming is accepted as an important indicator of 'health policy' formation. [42, 158] While assessing 'meaningful involvement' is complex, we adopt a simple indicator: the presence of a national organisation of drug users.
	COORDINATED NATIONAL STRATEGY TO HIV PREVENTION AND DRUG USE
2.	Explicit and supportive reference to 'harm reduction' in national policy documents can mark a commitment to evidence-based interventions as part of HIV prevention responses targeting PWID. International agencies advocate institutional and national-level endorsement of harm reduction as a feature of national strategy. [33, 159] We adopt evidence of explicit supportive reference to harm reduction in national strategy as an indicator of enabling policy environment.
3.	Monitoring and evaluating the state of the epidemic and response is an important element of building evidence-based responses. [40, 160] Targeted sero-prevalence and behavioural surveillance is recommended in concentrated HIV epidemics. [161] We adopt as an indicator of enabling policy evidence of at least one HIV sero-prevalence and one behavioural study among PWID since 2000.
	IMPLEMENTATION OF PUBLIC HEALTH ORIENTED APPROACHES TO REDUCING HARM
4.	Drug control policies which seek to distinguish drug users from drug traders and traffickers, and which de-emphasise the criminalisation of drug users, can give priority to public health oriented approaches to reducing drug-related harm. We adopt the application of administrative rather than criminal penalties for drug use and possession of quantities for personal use as an indicator of an enabling policy environment.
5.	We adopt the legal availability of OST and NSP in a country as an indicator of enabling policy environment. These are core components of the recommended nine combination HIV prevention interventions for PWID [33] Many countries have adopted at least some recommended measures, but often the components missing are OST and NSPs. The effectiveness of both in improving the health of PWID is well established [32, 155, 162], especially for OST. [163 – 168 169] OST also facilitates access to and augments the effects of other interventions, such ART. [32, 152]
6.	The availability of OST and NSPs in prison can show a country's willingness to address the needs of even the most marginalised of its citizens, as well as demonstrating noteworthy scale of the programmes. Because of existing laws concerning drug use and possession, PWID in many countries account for disproportionately high rates of incarceration. [143] Prisons may act as a risk environment for HIV transmission linked to drug injecting. International guidelines [170] recommend continuity of services between prison and communities and some countries have developed successful partnerships between penal systems and HIV services, including in the European region. [171]

Appendix 1.A.4
Behavioural and intervention coverage parameter estimates used in the model fits

Parameter	Tallinn	St. Petersburg	Dushanbe
Average duration inject in years	16	30	8
Infection rate per month in latent phase of HIV	0.014	0.011	0.011
Seed HIV prevalence in 1996	1.5%	4%	2%
Baseline intervention coverage assumptions			
NSP	Assumed to scale up from nothing in 2003 to 40% reduction in HIV incidence in 2008. Effect on intermediate years proportional to syringes distributed.	0%	Assumed to scale up from nothing in 1999 to about 20% reduction in HIV risk by 2010 because achieved half NSP coverage of Tallinn.
OST	0%	0%	0%
ART	0%	0%	0%

Appendix 1.A.5
HIV natural history and intervention efficacy parameters for model fits (symbols used in model equations in brackets)

Model parameter	Value used	Data source
HIV 'biological' model parameters		
Infection rate per month in latent phase of HIV	Varied to fit model	See table 1 for values used in model fit
Cofactor increase in HIV transmission probability during: • Initial period of high viraemia (Γ) • Pre-AIDS period of high viraemia (Λ)	26 7	[1] [1] [1]
Duration of initial period of high viraemia in years (1/δ)	0.25	[1]
Duration of pre-AIDS period of high viraemia in years (1/λ)	0.75	
Duration of latent period in years (1/η)	9.4	[2]
Duration of AIDS in years (1/Δ)	1	[2]
Duration of HIV epidemic in years	12	Start of HIV epidemic set to 1996
Seed HIV prevalence at start of epidemic	Varied to fit model	Estimated through fitting model to HIV prevalence data (see Table 1)
Model intervention effectiveness parameters		
Relative HIV infection rate while on ART compared to latent phase transmission probability (Φ)	0.20	No data for PWID – Estimated from recent trials [3 – 4] adjusted for low adherence levels among PWID [5 – 11]

(continued next page)

Appendix 1.A.5 *(continued)*

Model parameter	Value used	Data source
Average survival time with HAART in years	15	PWID have lower survival on ART than non PWID [12]
Relative infection rate if susceptible IDU is currently on		
• OST (Ψ1)	0.5	Unpublished meta-analysis [13]
- High coverage NSP as in Tallinn in 2008/09 (Ψ2)	0.6	See text and [14]
- OST+NSP coverage (Ψ3)	Product of above	Similar to recent study considering efficacy of OST and NSP for HCV [15]

References

[1] Hollingsworth, T.D., R.M. Anderson, and C. Fraser, HIV-1 transmission, by stage of infection. *Journal of Infectious Diseases,* 2008. 198(5): p. 687 – 93.

[2] Prins, M., et al., Pre-AIDS mortality from natural causes associated with HIV disease progression: evidence from the European Seroconverter Study among injecting drug users. *AIDS*, 1997. 11(14): p. 1747 – 56.

[3] Cohen, M.S., et al., Prevention of HIV-1 infection with early antiretroviral therapy. *New England Journal of Medicine,* 2011. 365(6): p. 493 – 505.

[4] Donnell, D., et al., Heterosexual HIV-1 transmission after initiation of antiretroviral therapy: a prospective cohort analysis. *The Lancet*, 2010. 375(9731): p. 2092 – 8.

[5] Malta, M., et al., Adherence to antiretroviral therapy among HIV-infected drug users: a meta-analysis. *AIDS and Behavior,* 2010. 14(4): p. 731 – 47.

[6] Wood, E., et al., Adherence and plasma HIV RNA responses to highly active antiretroviral therapy among HIV-1 infected injection drug users. *Canadian Medical Association Journal*, 2003. 169(7): p. 656 – 61.

[7] Nolan, S., et al., Adherence and plasma HIV RNA response to antiretroviral therapy among HIV-seropositive injection drug users in a Canadian setting. *AIDS Care*, 2011. 23(8): p. 980 – 7.

[8] Bangsberg, D.R., et al., Adherence to protease inhibitors, HIV-1 viral load, and development of drug resistance in an indigent population. *AIDS*, 2000. 14(4): p. 357 – 66.

[9] Petersen, M.L., et al., Pillbox organizers are associated with improved adherence to HIV antiretroviral therapy and viral suppression: a marginal structural model analysis. *Clinical Infectious Diseases,* 2007. 45(7): p. 908 – 15.

[10] Gross, R., et al., Effect of adherence to newly initiated antiretroviral therapy on plasma viral load. AIDS, 2001. 15(16): p. 2109 – 17.

[11] Braithwaite, R.S., et al., Adherence, virological and immunological outcomes for HIV-infected veterans starting combination antiretroviral therapies. *AIDS*, 2007. 21(12): p. 1579 – 89.

[12] Carrico, A.W., Substance use and HIV disease progression in the HAART era: implications for the primary prevention of HIV. *Life Sciences,* 2011. 88 (21 – 22): p. 940 – 7.

[13] MacArthur, G.J., et al., Evidence for the effectiveness of opiate substitution treatment in relation to HIV transmission in people who inject drugs: a systematic review and meta-analysis. *In preparation*, 2012.

[14] Uuskula, A., et al., Expanded syringe exchange programs and reduced HIV infection among new injection drug users in Tallinn, Estonia. *BMC Public Health,* 2011. 11: p. 517.

[15] Turner, K., et al., The impact of needle and syringe provision and opiate substitution therapy on the incidence of Hepatitis C virus in injecting drug users: pooling of United Kingdom evidence. *Addiction* (web published ahead of print), 2011.

Appendix 2.A.1
Annual number of diagnostic tests for HIV undertaken in the WHO European Region

Country	Year	Number of HIV tests	Proportion of total	Proportion of total for sub-region	Tests per 1,000 people
West					
Andorra	2010	2,678	0%	0%	32
Austria	2008	751,749	2%	7%	90
Belgium	2010	651,095	1%	6%	61
Denmark	2006	154,332	0%	1%	28
Finland	2010	185,114	0%	2%	35
France	2010	4.977,463	10%	47%	80
Germany	2004	2.277,000	5%	21%	28
Greece	2009	2,083	0%	0%	0
Iceland	2010	7,318	0%	0%	23
Ireland	2009	184,980	0%	2%	42
Israel	2010	286,368	1%	3%	41
Italy	NA				
Liechtenstein	NA				
Luxembourg	2008	13,366	0%	0%	28
Malta	2007	11,957	0%	0%	29
Monaco	NA				
Netherlands	NA				
Norway	2006	188,550	0%	2%	40
Portugal	2005	917,117	2%	9%	86
San Marino	2010	5,090	0%	0%	164
Spain	NA				
Sweden	NA				
Switzerland	NA				
United Kingdom	NA				
	Total	**10.616,260**			**33**
Centre					
Albania	2006	3,098	0%	0%	1
Bosnia & Herzegovina	2010	20,793	0%	1%	6

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Appendix 2.A.1 *(continued)*

Country	Year	Number of HIV tests	Proportion of total	Proportion of total for sub-region	Tests per 1,000 people
Bulgaria	2010	150,000	0%	4%	20
Croatia	2008	38,996	0%	1%	9
Cyprus	2008	42,294	0%	1%	49
Czech Republic	2010	353,507	1%	10%	34
Hungary	2010	89,137	0%	3%	9
Macedonia, the	2007	10,574	0%	0%	5
Montenegro	2008	4,229	0%	0%	7
Poland	2010	187,600	0%	6%	5
Romania	2010	291,915	1%	9%	14
Serbia	2010	51,727	0%	2%	5
Slovakia	2010	109,261	0%	3%	20
Slovenia	2008	31,183	0%	1%	15
Turkey	2007	1.998,163	4%	59%	27
	Total	**3.382,477**			17
East					
Armenia	2010	60,731	0%	0%	20
Azerbaijan	2010	353,772	1%	1%	41
Belarus	2010	638,190	1%	2%	66
Estonia	2010	78,054	0%	0%	58
Georgia	2010	25,370	0%	0%	6
Kazakhstan	2009	2.297,588	5%	7%	148
Kyrgyzstan	2007	227,879	0%	1%	42
Latvia	2010	58,826	0%	0%	26
Lithuania	2010	178,554	0%	1%	54
Moldova	2006	216,566	0%	1%	60
Russia	2010	25.209,546	53%	75%	178
Tajikistan	2010	280,281	1%	1%	41
Turkmenistan	2007	211,789	0%	1%	42
Ukraine	2008	2.280,442	5%	7%	50
Uzbekistan	2010	1.506,724	3%	4%	55
	Total	33.624,312			119
Total		**47.623,049**			57

Sources: ECDC/WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011

Appendix 2.A.2
Annual number of HIV case reports in Europe: 2006 – 2010 and cumulative total

Sub-region	Year, number of reports and proportion of total					2010 diagnoses per million	Five year period 2006 – 2010		Since start of reporting	
	2006	2007	2008	2009	2010		Cumulative total & proportion of total	Annual average	Cumulative total & proportion of total	Per million
West	26,374	27,520	28,235	27,441	25,659	70	135,229	27,046	379,353	1,042
	30%	28%	25%	24%	22%		25%		30%	
Centre	1,870	2,039	2,247	2,464	2,478	13	11,098	2,220	33,308	172
	2%	2%	2%	2%	2%		2%		3%	
East	60,941	69,565	81,948	86,836	87,564	309	386,854	77,371	867,457	3,057
	68%	70%	73%	74%	76%		73%		68%	
All (100%)	**89,185**	**99,124**	**112,430**	**116,741**	**115,701**	**138**	**533,181**	**106,636**	**1.280,118**	**1,521**

Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011
Note: Data for most recent years may be revised due to delays in case reporting.

Appendix 2.A.3
HIV case reports in Europe by country and main exposure categories

Country	Cumulative cases associated with MSM		Cumulative cases associated with IDU		Cumulative cases associated with Heterosexual exposure		Cumulative number of cases: MSM, IDU or Heterosexual exposure only	All cases: Cumulative total	
	Total	Proportion of cases associated with MSM of the main exposure categories	Total	Proportion of cases associated with IDU exposure of the main exposure categories	Total	Proportion of cases associated with Heterosexual exposure of the main exposure categories		Total	Case per million people
West									
Andorra	17	37%	13	28%	16	35%	46	**57**	679
Austria									

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Appendix 2.A.3 *(continued)*

Country	Cumulative cases associated with MSM		Cumulative cases associated with IDU		Cumulative cases associated with Heterosexual exposure		Cumulative number of cases: MSM, IDU or Heterosexual exposure only	All cases: Cumulative total	
	Total	Proportion of cases associated with MSM of the main exposure categories	Total	Proportion of cases associated with IDU exposure of the main exposure categories	Total	Proportion of cases associated with Heterosexual exposure of the main exposure categories		Total	Case per million people
Belgium	5,175	34%	797	5%	9,210	61%	15,182	**23,406**	2,210
Denmark	2,350	43%	485	9%	2,604	48%	5,439	**5,872**	1,076
Finland	891	38%	360	15%	1,112	47%	2,363	**2,778**	524
France	10,227	34%	1,254	4%	18,867	62%	30,348	**43,199**	696
Germany	17,905	57%	3,045	10%	10,540	33%	31,490	**40,144**	488
Greece	4,918	65%	347	5%	2,355	31%	7,620	**10,531**	946
Iceland	104	44%	36	15%	94	40%	234	**257**	816
Ireland	1,391	28%	1,247	25%	2,307	47%	4,945	**5,599**	1,262
Israel	1,403	24%	913	16%	3,513	60%	5,829	**6,579**	933
Italy	3,988	33%	1,096	9%	6,927	58%	12,011	**14,438**	404
Liechtenstein									
Luxembourg	377	42%	124	14%	404	45%	905	**1,013**	2,106
Malta	23	21%	6	5%	81	74%	110	**132**	324
Monaco									
Netherlands	10,217	61%	713	4%	5,849	35%	16,779	**18,599**	1,125
Norway	1,450	33%	575	13%	2,387	54%	4,412	**4,626**	970
Portugal	3,398	13%	10,221	38%	13,376	50%	26,995	**27,840**	2,607
San Marino	17	39%	11	25%	16	36%	44	**68**	2,194
Spain	6,696	43%	2,011	13%	6,809	44%	15,516	**17,183**	594
Sweden	3,197	38%	1,142	14%	4,098	49%	8,437	**9,427**	1,024
Switzerland	4,653	31%	3,654	25%	6,480	44%	14,787	**32,214**	4,272
United Kingdom	50,610	47%	5,436	5%	51,906	48%	107,952	**115,391**	1,885

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Appendix 2.A.3 *(continued)*

Country	Cumulative cases associated with MSM		Cumulative cases associated with IDU		Cumulative cases associated with Heterosexual exposure		Cumulative number of cases: MSM, IDU or Heterosexual exposure only	All cases: Cumulative total	
	Total	Proportion of cases associated with MSM of the main exposure categories	Total	Proportion of cases associated with IDU exposure of the main exposure categories	Total	Proportion of cases associated with Heterosexual exposure of the main exposure categories		Total	Case per million people
Centre									
Albania	38	10%	1	0%	328	89%	367	**415**	132
Bosnia and Herzegovina	33	22%	21	14%	95	64%	149	**170**	45
Bulgaria	146	12%	292	24%	795	64%	1,233	**1,272**	168
Croatia	452	56%	58	7%	292	36%	802	**862**	195
Cyprus	228	35%	9	1%	409	63%	646	**681**	790
Czech Republic	907	64%	72	5%	448	31%	1,427	**1,522**	147
Hungary	1,061	76%	22	2%	322	23%	1,405	**1,953**	195
Macedonia	12	38%	2	6%	18	56%	32	**37**	18
Montenegro	47	47%	3	3%	51	50%	101	**119**	191
Poland	1,049	13%	5,844	74%	960	12%	7,853	**14,393**	378
Romania	121	7%	23	1%	1,555	92%	1,699	**4,764**	223
Serbia	638	29%	938	43%	590	27%	2,166	**2,593**	264
Slovakia	226	70%	10	3%	86	27%	322	**357**	66
Slovenia	302	76%	13	3%	85	21%	400	**487**	242
Turkey	218	9%	83	4%	2,053	87%	2,354	**3,683**	50
East									
Armenia	16	2%	386	43%	497	55%	899	**971**	316
Azerbaijan	22	1%	1,681	71%	662	28%	2,365	**2,723**	312
Belarus	61	1%	5,421	50%	5,425	50%	10,907	**11,204**	1,158
Estonia	93	2%	3,670	87%	449	11%	4,212	**7,692**	5,736
Georgia	83	3%	1,537	59%	970	37%	2,590	**2,691**	625

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Appendix 2.A.3 *(continued)*

Country	Cumulative cases associated with MSM		Cumulative cases associated with IDU		Cumulative cases associated with Heterosexual exposure		Cumulative number of cases: MSM, IDU or Heterosexual exposure only	All cases: Cumulative total	
	Total	Proportion of cases associated with MSM of the main exposure categories	Total	Proportion of cases associated with IDU exposure of the main exposure categories	Total	Proportion of cases associated with Heterosexual exposure of the main exposure categories		Total	Case per million people
Kazakhstan	82	1%	10,271	72%	3,998	28%	14,351	**15,754**	1,015
Kyrgyzstan	2	0%	2,163	71%	864	29%	3,029	**3,287**	607
Latvia	222	5%	2,775	68%	1,104	27%	4,101	**4,888**	2,164
Lithuania	106	7%	1,251	78%	246	15%	1,603	**1,734**	522
Moldova	36	1%	2,580	42%	3,480	57%	6,096	**6,356**	1,750
Russia	2,643	1%	237,586	77%	67,627	22%	307,856	**630,222**	4,457
Tajikistan	0	0%	1,490	68%	691	32%	2,181	**2,768**	405
Turkmenistan	0		0		0		0	**2**	0
Ukraine	406	0%	87,771	60%	59,185	40%	147,362	**153,108**	3,329
Uzbekistan	29	0%	11,410	71%	4,730	29%	16,169	**24,057**	885

Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011.

Appendix 2.A.4
Annual number of HIV case reports in Europe: 2006 – 2010 and cumulative total by gender

Sub-region	Sub-group	Year, number of reports & proportion of total					Cumulative total & proportion of total
		2006	2007	2008	2009	2010	
West	Male	17,762	19,135	19,866	19,645	18,776	**264,105**
	Female	8,571	8,339	8,330	7,744	6,861	**110,560**
	% female	*33%*	*30%*	*30%*	*28%*	*27%*	**30%**
	All†	26,374	27,520	28,235	27,441	25,659	**379,353**
Centre	Male	1,338	1,470	1,662	1,878	1,885	**22,776**
	Female	484	471	486	493	454	**8,353**
	% female	*27%*	*24%*	*23%*	*21%*	*19%*	**27%**
	All†	1,870	2,039	2,247	2,464	2,478	**33,308**
East‡	Male	35,864	41,049	68,863	50,839	51,625	**559,342**
	Female	25,073	28,252	12,594	35,997	35,736	**305,862**
	% female	*41%*	*41%*	*15%*	*41%*	*41%*	**35%**
	All†	60,941	69,565	81,948	86,836	87,564	**867,457**
All	Male	54,964	61,654	90,391	72,362	72,286	**846,223**
	Female	34,128	37,062	21,410	44,234	43,051	**424,775**
	% female	*38%*	*38%*	*19%*	*38%*	*37%*	**33%**
	All†	89,185	99,124	112,430	116,741	115,701	**1.280,118**

Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011.
Notes: Data for most recent years may be revised due to delays in case reporting. † = includes those where gender not reported. ‡ = For Russian data yearly number by gender was not given, proportion cases female was reported in the text and a figure and this was used to divide total number of cases into males and females for individual years (proportion female 2006 43.5%; 2007 43%; 2008 42%; 2009 41.5%; 2010 41%).

Appendix 2.A.5
Annual number of HIV case reports in Europe: 2006 – 2010 and cumulative total by age

Sub-region	Sub-group	Year, number of reports and proportion of total					Cumulative total and proportion of total
		2006	2007	2008	2009	2010	
West	<15	277	265	246	217	210	**5,679**
		1%	*1%*	*1%*	*1%*	*1%*	**1%**
	15 – 19	406	468	475	457	468	**7,351**
		2%	*2%*	*2%*	*2%*	*2%*	**2%**
	20 – 29	6,052	6,240	6,271	5,887	5,805	**102,938**
		23%	*23%*	*22%*	*21%*	*23%*	**27%**

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Appendix 2.A.5 *(continued)*

Sub-region	Sub-group	Year, number of reports and proportion of total					Cumulative total and proportion of total
		2006	2007	2008	2009	2010	
West	30 – 39	9,124	9,264	9,125	8,446	8,544	**134,893**
		35%	*34%*	*32%*	*31%*	*33%*	**36%**
	40 – 49	5,657	6,052	6,500	6,263	6,451	**71,600**
		21%	*22%*	*23%*	*23%*	*25%*	**19%**
	50+	3,130	3,400	3,676	3,790	3,900	**40,630**
		12%	*12%*	*13%*	*14%*	*15%*	**11%**
	Un-known	1,728	1,831	1,942	2,381	281	**16,262**
		7%	*7%*	*7%*	*9%*	*1%*	**4%**
	All†	**26,374**	**27,520**	**28,235**	**27,441**	**25,659**	**379,353**
Centre	<15	49	38	34	26	28	**2,641**
		3%	*2%*	*2%*	*1%*	*1%*	**8%**
	15 – 19	66	82	70	74	50	**1,549**
		4%	*4%*	*3%*	*3%*	*2%*	**5%**
	20 – 29	651	701	727	792	834	**11,360**
		35%	*34%*	*32%*	*32%*	*34%*	**34%**
	30 – 39	602	590	723	856	824	**8,746**
		32%	*29%*	*32%*	*35%*	*33%*	**26%**
	40 – 49	268	267	339	384	385	**3,790**
		14%	*13%*	*15%*	*16%*	*16%*	**11%**
	50+	142	203	220	256	260	**2,223**
		8%	*10%*	*10%*	*10%*	*10%*	**7%**
	Un-known	92	158	134	76	97	**2,999**
		5%	*8%*	*6%*	*3%*	*4%*	**9%**
	All†	**1,870**	**2,039**	**2,247**	**2,464**	**2,478**	**33,308**
East‡	<15	763	980	1,585	1,916	2,145	**10,563**
		1%	*1%*	*2%*	*2%*	*2%*	**1%**
	15 – 19	3,098	2,754	2,588	2,259	1,776	**74,741**
		5%	*4%*	*3%*	*3%*	*2%*	**9%**
	20 – 29	23,551	27,209	36,828	36,784	33,906	**369,477**
		39%	*39%*	*45%*	*42%*	*39%*	**43%**
	30 – 39	18,629	23,097	28,799	32,554	34,787	**219,989**
		31%	*33%*	*35%*	*37%*	*40%*	**25%**
	40 – 49	5,881	7,218	8,691	9,864	11,071	**65,213**
		10%	*10%*	*11%*	*11%*	*13%*	**8%**

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Appendix 2.A.5 *(continued)*

Sub-region	Sub-group	Year, number of reports and proportion of total					Cumulative total and proportion of total
		2006	2007	2008	2009	2010	
East‡	50+	1,919	2,409	2,946	3,436	3,873	**20,935**
		3%	*3%*	*4%*	*4%*	*4%*	**2%**
	Un-known	7,100	5,899	512	22	6	**106,539**
		12%	*8%*	*1%*	*0%*	*0%*	**12%**
	All†	**60,941**	**69,565**	**81,948**	**86,836**	**87,564**	**867,457**
Total	<15	1,089	1,283	1,865	2,159	2,383	**18,883**
		1%	*1%*	*2%*	*2%*	*2%*	**1%**
	15 – 19	3,570	3,304	3,133	2,790	2,294	**83,641**
		4%	*3%*	*3%*	*2%*	*2%*	**7%**
	20 – 29	30,254	34,150	43,826	43,463	40,545	**483,775**
		34%	*34%*	*39%*	*37%*	*35%*	**38%**
	30 – 39	28,355	32,951	38,647	41,856	44,155	**363,628**
		32%	*33%*	*34%*	*36%*	*38%*	**28%**
	40 – 49	11,806	13,537	15,530	16,511	17,907	**140,603**
		13%	*14%*	*14%*	*14%*	*15%*	**11%**
	50+	5,191	6,012	6,842	7,482	8,033	**63,788**
		6%	*6%*	*6%*	*6%*	*7%*	**5%**
	Un-known	8,920	7,888	2,588	2,479	384	**125,800**
		10%	*8%*	*2%*	*2%*	*0%*	**10%**
	All†	**89,185**	**99,124**	**112,430**	**116,741**	**115,701**	**1.280,118**

Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011.
Notes: Data for most recent years may be revised due to delays in case reporting; † = includes those where age not reported; ‡ = For Russian data yearly number by age was not reported, annual proportion by age group was reported in a figure and this was used to divide total number of cases in to age groups for the individual years.

Appendix 2.A.6
Annual average HIV case reports Europe: 2006 – 2010 by country and exposure

Country	Cases associated with sex between men		Cases associated with injecting drug use		Cases associated with Heterosexual exposure		Cases associated with mother to child transmission		Exposure not known or other*			All cases	
	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Proportion of total	Total	Cases per million people
West													
Andorra	**2**	19	0	0	**1**	10	0	-	**0**	5	14%	**3**	33
Belgium	**343**	32	16	2	**415**	39	9	1	**320**	30	29%	**1,102**	104
Denmark	**119**	22	13	2	**125**	23	3	1	**9**	2	3%	**269**	49
Finland	**54**	10	10	2	**84**	16	1	0	**32**	6	18%	**180**	34
France	**1,328**	21	135	2	**2,130**	34	29	0	**1,659**	27	31%	**5,281**	85
Germany	**1,572**	19	128	2	**695**	8	19	0	**410**	5	15%	**2,824**	34
Greece	**249**	22	10	1	**112**	10	2	0	**173**	16	32%	**546**	49
Iceland	**2**	7	3	10	**6**	20	0	0	**3**	10	21%	**15**	46
Ireland	**108**	24	39	9	**162**	36	6	1	**60**	13	16%	**375**	84
Israel	**123**	17	42	6	**191**	27	11	2	**15**	2	4%	**382**	54
Italy	**650**	18	151	4	**1,096**	31	7	0	**351**	10	16%	**2,255**	63
Luxembourg	**20**	41	3	6	**23**	47	0	0	**2**	4	4%	**47**	98
Malta	**3**	8	1	2	**13**	32	0	0	**3**	8	16%	**20**	50
Netherlands	**714**	43	8	0	**327**	20	7	0	**61**	4	5%	**1,117**	68
Norway	**86**	18	11	2	**163**	34	5	1	**7**	2	3%	**273**	57

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Appendix 2.A.6 *(continued)*

Country	Cases associated with sex between men		Cases associated with injecting drug use		Cases associated with Heterosexual exposure		Cases associated with mother to child transmission		Exposure not known or other*			All cases	
	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Proportion of total	Total	Cases per million people
Portugal	**287**	27	282	26	**976**	91	9	1	**41**	4	3%	**1,595**	149
San Marino	**0**	0	0	0	**0**	6	0	0	**2**	77	92%	**3**	84
Spain	**1,079**	37	233	8	**974**	34	8	0	**274**	9	11%	**2,568**	89
Sweden	**110**	12	33	4	**207**	22	10	1	**60**	7	14%	**420**	46
Switzerland	**261**	35	36	5	**281**	37	4	1	**134**	18	19%	**715**	95
United Kingdom	**2,659**	43	169	3	**3,697**	60	106	2	**425**	7	6%	**7,057**	115
TOTAL	**9,768**	**27**	**1,323**	**4**	**11,676**	**32**	**237**	**0**	**4,043**	**11**		**27,046**	**74**
Centre													
Albania	**4**	1	0	0	**36**	12	2	1	**3**	1	7%	**47**	15
Bosnia and Herzegovina	**3**	1	0	0	**4**	1	0	0	**0**	0	0%	**7**	2
Bulgaria	**22**	3	52	7	**59**	8	1	0	**0**	0	0%	**135**	18
Croatia	**44**	10	1	0	**12**	3	0	0	**1**	0	2%	**59**	13
Cyprus	**13**	16	1	1	**23**	26	0	0	**3**	3	7%	**39**	46
Czech Republic	**92**	9	7	1	**36**	3	0	0	**5**	0	4%	**139**	13
Hungary	**81**	8	1	0	**18**	2	1	0	**33**	3	25%	**133**	13
Macedonia	**2**	1	0	0	**2**	1	0	0	**0**	0	8%	**5**	2

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Appendix 2.A.6 *(continued)*

Country	Cases associated with sex between men		Cases associated with injecting drug use		Cases associated with Heterosexual exposure		Cases associated with mother to child transmission		Exposure not known or other*			All cases	
	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Proportion of total	Total	Cases per million people
Montenegro	**7**	11	0	0	**3**	5	0	0	**1**	1	7%	**11**	18
Poland	**71**	2	70	2	**72**	2	3	0	**657**	17	75%	**874**	23
Romania	**15**	1	2	0	**101**	5	7	0	**57**	3	31%	**182**	9
Serbia	**63**	6	9	1	**27**	3	1	0	**15**	2	13%	**114**	12
Slovakia	**26**	5	2	0	**8**	2	0	0	**5**	1	12%	**40**	7
Slovenia	**29**	14	0	0	**4**	2	0	0	**7**	3	16%	**40**	20
Turkey	**18**	0	2	0	**226**	3	4	0	**144**	2	37%	**394**	5
TOTAL	**489**	**3**	**147**	**1**	**632**	**3**	**20**	**0**	**931**	**5**		**2,220**	**11**
East													
Armenia	**2**	1	37	12	**72**	24	3	1	**7**	2	6%	**121**	39
Azerbaijan	**3**	0	263	30	**90**	10	5	1	**44**	5	11%	**405**	46
Belarus	**7**	1	234	24	**678**	70	20	2	**11**	1	1%	**949**	98
Estonia	**0**	0	98	73	**18**	13	4	3	**406**	303	77%	**526**	392
Georgia	**11**	3	194	45	**142**	33	10	2	**3**	1	1%	**360**	84
Kazakhstan	**13**	1	1,202	77	**615**	40	27	2	**169**	11	8%	**2,026**	131
Kyrgyzstan	**0**	0	305	56	**139**	26	14	3	**34**	6	7%	**492**	91
Latvia	**17**	8	102	45	**128**	57	5	2	**59**	26	19%	**311**	138
Lithuania	**7**	2	77	23	**26**	8	0	0	**16**	5	13%	**127**	38

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Appendix 2.A.6 *(continued)*

Country	Cases associated with sex between men		Cases associated with injecting drug use		Cases associated with Heterosexual exposure		Cases associated with mother to child transmission		Exposure not known or other*			All cases	
	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Total	Cases per million people	Proportion of total	Total	Cases per million people
Moldova	**4**	1	143	39	**527**	145	11	3	**25**	7	3%	**710**	196
Russia	**260**	2	13,910	98	**8,128**	57	430	3	**29,844**	211	57%	**52,572**	372
Tajikistan	**0**	0	231	34	**128**	19	7	1	**87**	13	19%	**452**	66
Turkmenistan	**0**	0	0	0	**0**	0	0	0	**0**	0	-	**0**	0
Ukraine	**66**	1	7,056	153	**7,385**	161	189	4	**365**	8	2%	**15,061**	327
Uzbekistan	**0**	0	1,459	54	**744**	27	68	3	**986**	36	30%	**3,257**	120
TOTAL	**391**	**1**	**25,310**	**89**	**18,820**	**66**	**793**	**0**	**32,057**	**116**		**77,371**	**273**

Sources: ECDC / WHO European Office HIV Report 2011 and Russian AIDS Centre Report 2011.

Appendix 2.A.7
Characteristics of HIV prevalence studies among PWID across Europe

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
West	Austria	1	Y		National	41	Drug treatment & LT	417	2009	[14]	N		
	Belgium	1	Y		City	1	Drug treatment & LT	329	2009		Y	Y	
	Denmark	1	Y		National	5	Overdose death post mortem	188	2009	[14]	N		
	Finland	1	Y	Methods inconsistent	National	4	Needle exchanges	1560	2009	[14]	Y	Y	

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Appendix 2.A.7 *(continued)*

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
West	France	3	Y	Methods inconsistent	City	5	Community & LT	342	2009	[14]	Y	Y	
	Germany	2	Y	Last data 2007	National		Overdose death post mortem	1394	2009	[14]	N		
	Greece	3	Y		National	19	Drug treatment, HIV test centres & LT	741	2009	[14]	Y	Y	
	Iceland										N		
	Ireland	2	N		City	1	Drug treatment	64	2003	[14]	Y	Y	
	Israel	1	N		National	1	Note review of addiction treatment	743	2003/5	[15]	N		
	Italy	4	Y		National	522	Drug treatment centres	63989	2009	[14]	N		
	Luxembourg	1	N		National	13	Drug treatment, HIV test centres, prisons, ante-natal care & LT	202	2005	[14]	Y	Y	
	Malta	1	N		National	1	Drug treatment centres	175	2006	[14]	N		
	Netherlands		Y	Cohort study (n<50)							Y	Y	
	Norway	2	Y		National	14	Drug treatment centres	3905	2009	[14]	N		
	Portugal	3	Y		National		Drug treatment centres	2381	2009	[14]	N		
	Spain	8	Y	Last data 2007	National		Drug treatment centres	8643	2007	[14]	Y	Y	
	Sweden	5	Y	Prison sample	N/A	2	Prison, HIV testing	259	2009	[34]	N		
	Switzerland	2	Y	No Recent data found	City	5	HIV testing	1063	1996/2006	[123]	Y	Y	

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Appendix 2.A.7 *(continued)*

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
	United Kingdom	9	Y		National‡	4	Drug treatment, HIV testing, NSP & LT	5590	2009	[14]	Y	Y	
Centre	Albania	2	Y		City	1	Community	200	2008	[124]	Y	Y	2005 and 2008 only
	Bosnia & Herzegovina	2	Y		City‡	3	Community	780	2009	[26]	Y	Y	2007 and 2009 only
	Bulgaria	3	Y		National	8	Community & brothels	1421	2008	[125]	Y	Y	Since 2004 annual
	Croatia	7	Y	Methods inconsistent	City	3	Drug treatment, HIV test centres & LT	399	2007	[14]	Y	N	
	Cyprus	2	Y		National		Drug treatment	89	2009	[14]	N		
	Czech Republic	3	Y		National		Drug treatment, HIV test centres, prisons & LT	1363	2009	[14]	Y	Y	Detail not clear
	Hungary	6	Y		National	18	Drug treatment, needle exchanges	590	2009	[14]	Y	N	Multiple surveys at different time points
	Macedonia	1	Y		National	6	Community	597	2007	[18]	Y	Y	
	Montenegro	1	Y	First study in 2008 due to be repeated every 2 or 3 years	N/A	N/A	Community - RDS	317	2008	[40]	Y	Y	
	Poland	2	Y		National		Public health laboratories	1713	2009	[14]	Y	N?	Under consideration
	Romania	2	Y	Methods inconsistent	City	1	Community—RDS	449	2009	[126]	Y	Y	Repeated 2010

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Appendix 2.A.7 *(continued)*

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
	Serbia	2	Y	First study in 2008 due to be repeated 2010	City‡	3	Community	960	2010	[24]	Y	Y	Will be repeated every 2 / 3 years
East	Slovakia	1	Y		City	1	Drug treatment centres	97	2009	[14]	N		
	Slovenia	3	Y		National	18	Drug treatment centres	266	2009	[14]	Y	Y	
	Turkey	2	N		National	3	Community	68	2006/7	[16]	Y	N	
	Armenia	1	Y		N/A	N/A	N/A	N/A	2007	[127]	Y	Y	
	Azerbaijan	2	Y	Methods inconsistent	City	7	Community	1000	2007/8	[36]	Y	Y	Methods inconsistent
	Belarus	2	Y		National	16	N/A	1770	2008	[25]	Y	Y	Methods & frequency inconsistent
	Estonia	7	N		City‡	2	Community - RDS	350	2007		Y	Y	
	Georgia	9	Y		City	6	Community	1289	2008/9	[23]	Y	Y	
	Kazakhstan	1	Y		National	22	Community	4860	2009	[20]	Y	Y	
	Kyrgyzstan	1	Y		National	5	Community - RDS	900	2009	[20]	Y	Y	
	Latvia	3	Y		National		Drug treatment & HIV testing	987	2003	[14]	Y	Y	
	Lithuania	8	Y	Methods & sites inconsistent	National		Drug treatment, needle exchange & HIV testing	1112	2003	[14]	Y	Y	
	Moldova	2	Y		City‡	2	Community	663	2009	[45]	Y	Y	Method has varied over time
	Russian Federation	16	Y	Methods & sites inconsistent	City‡	5	N/A	1799	2008/9	[66]	Y	Y	Consistency over time not clear

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Appendix 2.A.7 *(continued)*

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
	Tajikistan	2	Y		N/A	8	Community—RDS	1657	2009	[20]	Y	Y	
	Turkmenistan												
	Ukraine	8	Y		National	28	Community	6459	2009	[22]	Y	Y	
	Uzbekistan	2	Y		National	14	Community	3743	2007	[19]	Y	Y	

Notes: N/A = Not available LT= Low Threshold NSP=Needle Syringe Programme; # = Number of studies identified during the period 2005 – 2011; ‡ = Estimates from single studies with the exception of the following countries where a weighted estimate was calculated from multiple studies; (n): United Kingdom (3); Moldova (2);Bosnia & Herzegovinia (2); Russia (2); Estonia (2) * = Behavioural studies not necessarily linked into biological data, this column documents only whether they have been undertaken among PWID.

Appendix 2.A.8
Characteristics of HIV prevalence studies among FSWs across Europe

Country name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# Sites	Recruitment strategy	n	Year	Reference	Undertaken		
West	Austria	4	N		National	N/A	STI Clinic	1184	2002	[128]	N		
	Belgium	1	N		City	1	N/A	1016	2008	[10]	Y	Y	
	Denmark										N		
	Finland										N		
	France	1			City	1	N/a	46	2008	[10]	N		
	Germany	2	N		National	N/A	STI Clinics	3880	2010 – 2011	[77]	N		
	Greece	1	N		City	1	STI Clinics	299	2005	[129]	N		
	Iceland										N		
	Ireland										N		

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Appendix 2.A.8 *(continued)*

Country name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# Sites	Recruitment strategy	n	Year	Reference	Undertaken		
West	Israel	2	N		City	1	Work	300	N/A	[130]	Y	N	
	Italy	4	Y	Methods inconsistent	City	1	HIV Clinic	229	1992 – 2007	[86]	Y	Y	
	Luxembourg										Y	Y	
	Malta										N		
	Netherlands	2	N		National‡	1	Clinic & Work	1417	2002 – 2005	[80, 128]	Y	Y	
	Norway	1	N		City	1	Clinic & Work	746	2008	[10]	N		
	Portugal	1	N		City	1	Work (street)	96	2000 – 2001	[10, 84]	N		
	Spain	4	N		City‡	4	STI Clinic	4485	2000 – 2001	[82, 83]	Y	Y	
	Sweden	1	N	n<50	Region	1	Prison	45	2006 – 2007	[10]	N		
	Switzerland										Y	Y	
	United Kingdom	5	N		City	1	STI clinic & Work	268	2008 – 2009	[82, 83, 85]	Y	Y	
Centre	Albania	1	N		City	1	RDS	90	2008	[44]	Y	N	
	Bosnia & Herzegovina	1	N		City	N/A	N/A	42	2007	[125]	Y	N	
	Bulgaria	3	Y		National	8	N/A	799	2008	[17]	Y	Y	
	Croatia	1	N		City	7	NGO	43	2003 – 2005	[131]	Y	N	
	Czech Republic	2	N		City	7	N/A	585	1999 – 2000	[132]	Y	N	
	Hungary	1	N		N/A	N/A	Screening	500	2006	[10]	N		
	Macedonia	3	Y	n<70	National‡	N/A	N/A	118	2006, 2007	[18]	Y	N	
	Montenegro		N								N		

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Appendix 2.A.8 *(continued)*

Country name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# Sites	Recruitment strategy	n	Year	Reference	Undertaken		
Centre	Poland	2	Y		City	13	Work/Clinic	650	2002 – 2005	[128]	Y	N	
	Romania	1			City	1	Work (street)	204	2006	[10]	Y	N	
	Serbia	1	Y	2 years	City	1	N/A	250	2010	[133]	Y	Y	2 years
	Slovakia										N		
	Slovenia										N		
	Turkey	1	N		City	3	Work	252	2006 – 2007	[16]	Y	N	
East	Armenia	3	Y	Infrequent	National	3	Work/ HIV & STI Clinic	250	2005	[128]	Y	N	
	Azerbaijan	2	Y	2 years	City	2	Work	300	2007 – 2008	[134]	Y	Y	2 years
	Belarus	3	Y	Methods unclear	City‡	7	N/A	937	2004 – 2009	[25, 135]	Y	N	
	Estonia	1	N		City	1	Work	257	2005/6	[136]	Y	Y	
	Georgia	4	Y	2 years so far	City	1	Work	160	2009	[137]	Y	Y	
	Kazakhstan	6	Y		National	2	Work/STI Clinic	1960	2005	[128]	Y	Y	
	Kyrgyzstan	4	Y		City	2	STI Clinic	352	2006	[91]	Y	Y	
	Latvia	2	Y	2 years so far	City	1	Work	93	2004	[128]	N		
	Lithuania	2	Y		City	1	Work	101	2005	[128]	Y	Y	
	Moldova	4	Y		City	1	RDS	300	2009	[45]	Y	Y	

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Appendix 2.A.8 *(continued)*

Country name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		#	Repeated		Area covered	# Sites	Recruitment strategy	n	Year	Reference	Undertaken		
	Russian Federation	17	Y	Methods & sites inconsistent	National‡	48	N/A	4209	2000 – 2009	[32, 66, 78, 79, 128, 138]	Y	Y	
East	Tajikistan	4	Y		Region	5	STI Clinic	1800	2008	[32, 66, 78, 79, 91, 128, 138]	Y	Y	
	Turkmenistan										N		
	Ukraine	3	Y	2 years so far	City‡	16	Work	2278	2008	[22, 139]	Y	Y	2 years
	Uzbekistan	3	Y		City‡	Multiple	N/A	2000	2005 – 2007	[140]	Y	Y	2 years

Notes: N/A = Not available; # = Number of studies identified during the period 2005 – 2011; ‡ = Estimates from single studies with the exception of where a weighted estimate was taken from multiple studies; (n): Netherlands (2); Spain (2); Montenegro (2); Belarus (2); Russia (7); Ukraine (2); Uzbekistan (unclear—possibly 3 between 2005 – 2007); * = Behavioural studies not necessarily linked into biological data, this column documents only whether they have been undertaken among SWs.

Appendix 2.A.9
Characteristics of HIV prevalence studies among male and transgender sex workers across Europe

Country name		No. (#)	Area covered	# Sites	Recruitment strategy	n	Year	Behavioural data	Reference
West	Belgium	1	City	1	Outreach	120	1999/2004	Yes	[141]
	Italy	2	City	1	Clinic	752	1992/2007	Yes	[86]
	Netherlands	1	City	2	Clinic/Work	70	2002 – 2005	Yes	[142]
	Spain	1	National	19	Clinic	1935	2000 – 2007	Yes	[143]
	United Kingdom	2	City	1	STI clinic	636	199 – 2003	Yes	[120]
East	Russian Federation	1	City	1	Work	50	2005 – 2006	Yes	[119]

Note: n = sample size.

Appendix 2.A.10
Characteristics of HIV prevalence studies among MSM across Europe

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		No. (#)	Repeated		Area covered	# Sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
West	Austria										N		
	Belgium	3	N		City	2	Community	649	2009/10	[98]	Y	Y	
	Denmark										Y	Y	
	Finland										Y	N	
	France	2	N		City	1	Community	886	2009	[105]	Y	Y	
	Germany										Y	Y	
	Greece										Y	Y	NGO Service provider data
	Iceland										N		
	Ireland										Y	Y	
	Israel										Y	N	
	Italy	2	N		City	1	Community—TLS	342	2008/9	[102]	Y	N	
	Luxembourg										N		
	Malta										N		
	Netherlands	4	N		National	N/A	STI clinics	3483	2004		Y	Y	
	Norway										Y	Y	
	Portugal	1	N		City	1	STI clinics	468	2002	[128]	N		
	Spain	5	Y	Regional	National	19	STI clinics	4165	2003	[128]	Y	Y	
	Sweden										Y	Y	

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Appendix 2.A.10 *(continued)*

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		No. (#)	Repeated		Area covered	# Sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
West	Switzerland	3	?	Unclear if still ongoing	National	N/A	HIV testing	1091	2004	[128]	Y	Y	
	United Kingdom	11	Y		City	5	Community—TLS	3501	2009	[96]	Y	Y	
Centre	Albania	2	Y	2 surveys, 3 years	City	1	Community —RDS	198	2008	[103]	Y	Y	
	Bosnia & Herzegovina	1	N		N/A	N/A	N/A	224	2007	[125]	Y	N	
	Bulgaria	1	Y		National	3	HIV testing	452	2008	[17]	Y	Y	
	Croatia	3	N	Unclear	City	1	Community—RDS	360	2006	[99]	Y	N	
	Cyprus										N		
	Czech Republic	2	Y		City	1	Community—TLS	390	2008/9	[102]	Y	N	
	Hungary	2	Y	2 surveys, 2 years	N/A	N/A	N/A	388	2009	[144]	Y	N	Unclear
	Macedonia	1	Y	Unclear	National	N/A	Community	37	2007	[18]	Y	Y	
	Montenegro										N		
	Poland	1	N		National	8	Community	404	2004	[101]	Y	N	
	Romania	1	N		City	1	Community—TLS	389	2008/9	[102]	Y	N	
	Serbia	2	Y	First in 2008	City	2	Community	N/A	2008	[24]	Y	Y	First in 2008
	Slovakia	1	N		City	1	Community—TLS	345	2008/9	[102]	Y	N	
	Slovenia	2	Y		City	1	Community—TLS	387	2008/9	[102]	Y	Y	
	Turkey	1	N		National	N/A	Community	166	2006/7	[16]	Y	N	
East	Armenia	1	N		N/A	N/A	N/A	N/A	2007	[127]	Y	Y	Last data in 2007, small sample sizes
	Azerbaijan	1	N		City	1	Community	100	2007/8	[36]	Y	N	
	Belarus	2	Y		National	7	N/A	480	2009	[25]	Y	Y	

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Appendix 2.A.10 *(continued)*

Country Name		Sero-prevalence studies			Best Estimates of sero-prevalence studies ‡						Behavioural studies*		
		No. (#)	Repeated		Area covered	# Sites	Recruitment strategy	n	Year	Reference	Undertaken/Repeated		
East	Estonia	1	N		City	1	Community & health services	79	2008	[35]	Y	Y	
	Georgia	1	Y	2 surveys, 2 years apart	City	1	Community—RDS	136	2007	[104]	Y	Y	Last data for 2007
	Kazakhstan	2	Y		N/A	N/A	Sentinel surveillance	880	2009	[97]	Y	Y	
	Kyrgyzstan	1	Y		N/A	N/A	Community—RDS	84	2008	[106]	Y	Y	
	Latvia										Y	N	
	Lithuania	1	Y	2 surveys (2008 & 2009)	N/A	N/A	N/A	N/A	2009	[145]	Y	Y	
	Moldova	1	Y		City	1	N/A	N/A	2009	[45]	Y	Y	
	Russian Federation	5	Y	Methods inconsistent	City	5	Community	1179	2006	[79] [66]	Y	Y	Methods & sites inconsistent
	Tajikistan										Y	N	
	Turkmenistan										N		
	Ukraine	1	Y	Methods inconsistent	National	13	Community	N/A	2009	[22]	Y	Y	
	Uzbekistan	1	Y		National	4	N/A	N/A	2009	[94]	Y	Y	

Notes: N/A = Not available; # = Number of studies identified during the period 2005 – 2011; ‡ = Estimates from single studies with the exception of the following countries where a weighted estimate was calculated from multiple studies; (n): Russia (2); * = Behavioural studies not necessarily linked into biological data, this column documents only whether they have been undertaken among MSM

Appendix 2.A.11
Countries with population size estimates of PWID, SWs and MSM

Country		PWID Estimate			MSM Estimate			SW Estimate		
		Year	n	Source	Year	n	Source	Year	n	Source
West	Austria	2000	17,500	[146]	No			2000	29,060	[147]
	Belgium	1997	25,800	[146]	No			2000	16,972	[147]
	Denmark	2006	12,754	[14]	No			2000	6,370	[147]
	Finland	2002	15,650	[146]	No			2000	5,625	[147]
	France	1999	122,000	[146]	No			2000	35,421	[147]
	Germany	2005	94,250	[14]	No			2000	387,719	[147]
	Greece	2009	10658	[14]	No			2000	12,446	[147]
	Iceland				No			No		
	Ireland	1996	6,289	[146]	No			No		
	Israel				No			No		
	Italy	1996	326,000	[146]	No			2000	64,468	[147]
	Luxembourg	2007	1,482	[14]	No			2000	2,828	[147]
	Malta				No			No		
	Netherlands	2008	2390	[14]	No			2000	23,979	[147]
	Norway	2008	10238	[14]	No			2000	3,974	[147]
	Portugal	2005	16,425	[14]	No			2007	9,695	[90]
	Spain	1998	83,972	[146]	No			2000	61,868	[147]
	Sweden	2007	29,513	[14]	No			2000	2,976	[147]
	Switzerland	1997	31,653	[146]	No			No		
	United Kingdom	2004/7	147900	[14]	No	5% men “not entirely heterosexual”	[148]	2000	83,043	[147]

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Appendix 2.A.11 *(continued)*

Country		PWID Estimate			MSM Estimate			SW Estimate		
		Year	n	Source	Year	n	Source	Year	n	Source
Centre	Albania	Yes, year not known	4,000	GF R5 Proposal mid-point [149]	No			2004	7,217	[147]
	Bosnia/ Herzegovina	2009	7500	[150]	No			2004	6,665	[147, 149]
	Bulgaria	2005	20,250	[146]	No			2004	12,962	[147]
	Croatia	2009	3145	[14]	No			2004	7,480	[147]
	Cyprus	2009	481	[14]	No			No		[147]
	Czech Republic	2009	35300	[14]	No			2004	13,842	[147]
	Hungary	2008/9	5699	[14]	No			2004	18,018	[147]
	Macedonia (FYR)	2007	17500	[151]	No			2004	6,120	[147]
	Montenegro	Yes, year not known	1,980		No			2004	1,284	[147]
	Poland				No			2004	45,968	[147]
	Romania	2009	17767	[14]	No			2004	32,065	[147]
	Serbia	Yes, year not known	18,000	[133]	2006	3,745 – 10,691 according to the multiplier method and between 4,476 and 5,996 using capture-recapture. 2.4% of men had AI with a man in past 12 months	[152]	2004	14,994	[147]
	Slovakia	2006	18,841	[14]	No			2004	7,642	[147]
	Slovenia	2001	7,320	[146]	1999 – 2001	3.3% some homosexual experience; 1% anal intercourse	?	2004	6,323	[147]
	Turkey				No			2004	29,000	[153]
	Armenia	2000	2,000	[146]	?	17000 – 65000	[154]	2004	11,770	[147]

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Appendix 2.A.11 *(continued)*

Country		PWID Estimate			MSM Estimate			SW Estimate		
		Year	n	Source	Year	n	Source	Year	n	Source
East	Azerbaijan	2006	300,000	[146]	No			2004	43,723	[147, 149]
	Belarus	2005	6,308	[146]	No			2004	20,605	[147, 149]
	Estonia	2004	13,886	[14]	No			2004	3,202	[147]
	Georgia	2004	127,833	[146]	No			2004	16,135	[147]
	Kazakhstan	2006	124,400	[92]	?	1.9% of men aged >15 have ever had sex with a man	[155]	2004	32,080	[147, 149]
	Kyrgyzstan	2006	25,000	[146]	?	2% of sexually active men	[156]	2004	5,466	[147, 149]
	Latvia	N/A	3,429	Imputed using [14]	No			2004	7,545	[147]
	Lithuania	2006	5,123	[146]	No			2004	4,951	[147]
	Moldova	2001	3,810	[146]	?	2% of men reporting anal intercourse	[157]	2005	5,000	[149]
	Russia	2007	1.825,000	[146]	No			2004	263,480	[147]
	Tajikistan	2006	25,000	[158]	No			2004	5,988	[147]
	Turkmenistan	N/A			No			2004	2,487	[147]
	Ukraine	2006	375,000	[146]	No			2004	79,180	[147]
	Uzbekistan	2006	80,000	[146]	No			2004	25,671	[147]

Notes: AI = anal intercourse; GF = Global Fund Project Monitoring Report; n = sample size.

Appendix 3.A.1
Suimmary of studies included in systematic review and range of HIV prevalence estimates among PWID in Western European countries

Country	City	Population sample	Survey Year	Survey design	No. of studies	HIV prevalence range	"Best" prevalence estimate	References
Austria	Nationwide	IDUs	2008	Diagnostic testing	1	1%	1%	[175]
Belgium	Antwerp	IDUs	2008	Diagnostic testing	1	6.4%	6.4%	[175]
Denmark	Nationwide	IDUs	2006	Prevalence study using unlinked, anonymous testing	1	2.1%	2.1%	[175]
Finland	Nationwide	IDUs	2009	Accessibility	1	0.7%	0.7%	[98]
France	Lille, Strasbourg, Paris, Bordeaux, Marseille	Ever or current injectors or snorters, IDUs	2002/6	Cross-sectional, prevalence study using unlinked anonymous testing	3	8% – 22%	8%	[17, 24, 175]
Germany	Nationwide	Drug users including ever IDUs	1998/2007	Cross-sectional, diagnostic testing	2	3.4% – 18%	3.4%	[99, 175]
Greece	Nationwide	IDUs	2004/9	Diagnostic testing, Inpatient detox facility	3	0% – 0.7%	0.7%	[100, 175]
Ireland	Dublin	Opiate users, IDUs	2001/3	Cross-sectional	2	11% – 12.5%	12.5%	[101, 175]
Israel	Nationwide	Ever IDUs	2003/5	Hospital data	1	1.9%	1.9%	[56]
Italy	Nationwide	Drug users (76% – 89% IDUs)	2002/8	Cross-sectional, diagnostic testing, outpatient records review	4	6.5% – 14.4%	11.7%	[22, 23, 61, 175]
Luxembourg	Nationwide	IDUs	2005	Prevalence study	1	2.5%	2.5%	[65]
Malta	Nationwide	IDUs	2006	Diagnostic testing	1	0%	0%	[175]
Norway	14 sites	IDUs	2008	Prevalence study	2	0.6% – 2.8%	2.8%	[175]

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Appendix 3.A. 1 *(continued)*

Country	City	Population sample	Survey Year	Survey design	No. of studies	HIV prevalence range	"Best" prevalence estimate	References
Portugal	Nationwide	IDUs	2008	Diagnostic testing	3	9.2% – 18.4%	9.2%	[175]
Spain	Nationwide	Ever injected, current heroin users, VCT users	1999/2006	Cross-sectional	8	6.5% – 58.1%	34.5%	[64, 102, 104 – 106, 175 – 178]
Sweden	Stockholm, Gothenburg, Stockholm county	IDUs	2007/9	Diagnostic testing, prevalence study	5	0% – 9.3%	9.3%	[175, 179]
Switzerland	Nationwide	Entering heroin assisted therapy for first time, Ever IDUs	2000/6	Cross-sectional	2	2.0% – 12.6%	2.0%	[108, 180]
United Kingdom	Nationwide	Ever & current IDUs	2001/10	Diagnostic testing, prevalence study, sentinel survey, prospective cohort	9	0.5% – 4.2%	1.1%	[57, 110, 113, 175, 181]

Note: IDU = injecting drug user; VCT = voluntary counseling and testing.

Appendix 3.A.2
Summary of studies included in systematic review and range of HIV prevalence estimates among PWID in Central European countries

Country	City	Population sample	Survey Year	Survey design	No. of studies	HIV prevalence range	"Best" prevalence estimate	References
Albania	Tirana	IDUs	2005/8	Cross-sectional	2	0%	0%	[141, 142]
Bosnia & Herzegovina	Zenica, Luka, Sarajevo	IDUs	2007/9	Descriptive	2	0.3% – 0.6%	0.4%	[143, 182]
Bulgaria	Sofia & nationwide	IDUs	2003/8	Cross-sectional, diagnostic testing	3	0.5% – 6.8%	6.8%	[49, 145, 175]
Croatia	Nationwide	IDUs	2001/8	Convenience, prevalence study, diagnostic testing	7	0% – 1.5%	0%	[54, 146 – 148, 175]
Cyprus	Nationwide	IDUs	2008	Diagnostic testing, prevalence study	2	0%	0%	[175]
Czech Republic	Cheb, Usti nad Labem, Ostrava and Prague	IDUs	1999/2008	Cross-sectional, diagnostic testing	3	0.07% – 0.2%	0.07%	[97, 175]
Hungary	Nationwide	IDUs	1999/2008	Cross-sectional, prevalence study	6	0% – 0.8%	0%	[55, 75, 79, 92, 175, 183]
Macedonia	Nationwide	IDUs	2007	Convenience	1	0%	0%	[151]
Montenegro	unclear	IDUs	2008	RDS	1	0.4%	0.4%	[152]
Poland	Nationwide	IDUs	2005/8	Diagnostic testing, prevalence survey	2	2.4% – 29.6%	9.2%	[175]
Romania	Bucharest	IDUs	2007/9	RDS, Diagnostic testing	2	1% – 1.6%	1%	[175, 184]
Serbia (& Montenegro)	Belgrade, Podgorica, Novi Sad, Nis	IDUs	2005 – 8	Cross-sectional	2	0% – 3.5%	2.0%	[42, 154, 185]
Slovakia	Bratislava	IDUs	2008	Diagnostic testing	1	1%	1%	[175]
Slovenia	Nationwide	IDUs	2005/9	UA survey of service users, prevalence study, diagnostic testing	3	0%	0%	[155, 175]
Turkey	Gaziantep, Ankara, Istanbul, Izmir	IDUs	2006/8	Diagnostic testing, convenience sampling	2	0% – 1.5%	1.5%	[156, 175]

Note: IDU = injecting drug user.

Appendix 3.A.3
Summary of studies included in systematic review and range of HIV prevalence estimates among PWID in Eastern European and Central Asian countries

Country	City	Population sample	Survey Year	Survey design	No. of studies	HIV prevalence range	"Best" prevalence estimate	References
Armenia	Unclear	IDUs	2007	unclear	1	6.8%	6.8%	[115]
Azerbaijan	Nationwide	IDUs	2003/8	Accessibility, street, snowball	2	1.3% – 33.0%	10.3%	[11, 116]
Belarus	Nationwide	IDUs	2004/9	Descriptive, UA sentinel testing survey	2	1.0% – 33.0%	10.7%	[117, 186]
Estonia	Tallinn, Kohtla-Jarve	IDUs	2002/9	Cross-sectional	7	26.7% (amphetamine only users) – 90%	53.5%	[47, 48, 70, 119 – 121, 187]
Georgia	Nationwide	Ever & current IDUs	1997/2009	Cross-sectional	9	0.5% – 11.7%	2.1%	[7 – 10, 13, 188, 189]
Kazakhstan	Nationwide	IDUs	2009	Snowball	1	2.90%	2.9%	[190]
Kyrgyzstan	Nationwide	IDUs	2009	RDS	1	14.3%	14.3%	[15]
Latvia	Riga	IDUs	2003/8	RDS, diagnostic testing, prevalence study	3	6.6% – 22.6%	6.6%	[48, 124, 175]
Lithuania	Vilnius, Alytus	IDUs, drug users including IDUs	2003/9	RDS, diagnostic testing, prevalence study	8	0.6% – 9.8%	2.4%	[48, 92, 175, 191]
Moldova	Chisinau, Balti	IDUs	2009	RDS	2	16% – 39%	28.6%	[125]
Russian Federation	Nationwide	Ever & current IDUs	1999/2009	Cross-sectional	16	8.6% – 61.1%	28.9	[18, 27, 44, 85, 90, 93, 126, 127, 130, 132, 164, 192 – 197]
Tajikistan	Nationwide	IDUs	2004/9	Cross-sectional, RDS	2	12.1% – 17.3%	17.3%	[15, 41, 163]
Ukraine	Nationwide	IDUs	1999/2009	Cross-sectional	8	3% – 80%	22.9%	[18, 25, 26, 69, 135 – 137, 198, 199]
Uzbekistan	Tashkent & nationwide	IDUs	2003/9	Cross-sectional	2	11.0% – 29.8%	13%	[15, 95, 138, 200]

Note: IDU = injecting drug user; RDS = ..

Appendix 3.A.4
Demographic and drug use characteristics of study respondents in Western Europe

Country	Male	Age (mid-pts)	Duration of injecting	Frequency injected	Main drug injected	% shared needle/ syringe	References
Finland						28 d: 32%	[98]
France	71 – 75%	mean 34 – 36	average age at first injection 20.4 – 21.2		(injected or snorted) 30% crack/ freebase, 27% cocaine, 20% heroin, 12% ecstasy	13%	[17, 24, 53]
Germany		median 31	72% > = 5 yrs	4m: median f 8 times, m 23 times	95% heroin		[99]
Ireland	60%	median 26					[101]
Israel	85%	mean 33.8	0.7 among IDUs		Among whole sample: heroin (with or without methadone)		
Italy	84 – 86%	mean 29 – 35 years	median 14.5 years		49% – 92% heroin		[22, 23, 61]
Luxembourg					Lifetime heroin100%, speedball 84.2%	6 m: 37% borrowed paraphernalia, 37% lent paraphernalia	[65]
Netherlands	61%	median age at entry: 30	median since first injection 7.2	6 m: 82% > weekly	6 m: 52% speedball		[63]
Spain	66% – 81%	mean 25.7 – 30.2 years	mean 7.6 – 11.6	6 m: 45% daily	67% heroin, 78 – 80% cocaine, 68% speedball	6m: 18%, 12 m: 19%, Ever 25% – 66%	[20, 64, 102, 103, 105, 106, 177, 178, 201 – 205]
Sweden	67%	median 42.5	median 19			61.9%	[62]
Switzerland	75% – 82	mean 33.7, median 36	mean 11.6 yrs, median 15	6 m: median # injections in past week: 7		6 m: 9%, 30 d: 5%	[108, 180]
United Kingdom	69% – 76%	mean 27.4 – 31	7 years	median: 2.5 times daily, 80% daily	71% opiates, 53% cocaine/ crack in past 12 m; 92% heroin	28 d: 21% – 31%	[57, 111, 113]

Notes: d = days; f = frequency; IDU = injecting drug user; m = months.

Appendix 3.A.5
Demographic and drug use characteristics of study respondents in Central Europe

Country	Male	Age (mid-pts)	Duration of injecting	Frequency injected	Main drug injected	% shared needle/ syringe	References
Albania	Majority (over 90%)	mean 25.4; 35% – 48% < 25	81% – 91% < = 5 years; 20% < 12 months	More than once per day 20%	90% heroin; 51% diazepam	last time injected: 18%; 30 days 54%	[141, 142]
Bosnia & Herzegovina	88% – 96%	mean 29 – 30	mean age at first injection 21	54% inject 2 – 3 times daily	97% heroin	30 d: 21% – 31%	[143, 144]
Bulgaria	79%	mean 25.9				last time injected: 14%	[49]
Croatia	83%	Median 26 – 30	Median 5 – 10 years			12 m: 30 – 48%	[54]
Czech Republic	70%	60% 18 – 22			heroin 48%; methamphetamine 42%		[97]
Hungary	69% – 77%	mean 22.6 – 27.9; 60% < = 30	mean 6.8; 39.2% <=5	daily heroin 32%; daily amphetamine 9%	heroin 52% – 79%; amphetamine 28% – 51%	30 d: 22 – 33%; (unclear period, includes syringe, cooker, filter, rinsewater) 62 – 68%	[55, 75, 76, 79, 92]
Macedonia	83%	mean 26.8	11% aged <15 years at first injection	15% – 37% daily	92% heroin, methadone 50%, benzodiazepines 49%	30 d: 34%	[151]
Montenegro	89%	23% < =25, 29% > = 31					[152]
Romania	78%	mean 28	mean age at first injection 20 yrs		30 d: 97% heroin	last injection: 15% did not use sterile equipment	[184]
Serbia (& Montenegro)	78% – 93%	20% – 41% <25 yrs	27% – 58% <5 yrs	39% – 53% daily	94% – 96% heroin	30 d: 15% – 30%	[42, 154]
Turkey		mean 30.3			51.5% heroin	30 d: 67%	[156]

Note: d = days

Appendix 3.A.6
Demographic and drug use characteristics of study respondents in Eastern Europe & Central Asia

Country	Male	Age (mid-pts)	Duration of injecting	Frequency injected	Main drug injected	% shared needle/ syringe	References
Armenia						At last injection: 5%	[115]
Azerbaijan	95%	mean 27 – 31.6	mean 9	21% – 46% daily	66% – 93% heroin, 36% homemade opiates	56% – 68%	[11, 116]
Belarus	75% – 77%	35% 25 – 29; 32% 30 – 39; mean 24	42% >7; mean 4 – 5	57% – 59% daily	79% – 86% heroin	6 m: 30% – 32%	[18, 117]
Estonia	53% – 88%	mean 23 – 26; 40 – 62% < = 20	mean 7.9	daily 61%	fentanyl 61% – 74%; 90% mak; 59% – 83% heroin, 31% – 45% amphetamines	28 d: 18% – 32%	[47, 48, 70, 71, 96, 119, 121, 187]
Georgia	92% – 100%	mean 27.5 – 40.5	mean 5 – 15.6; median 7		59% – 97% heroin, Buprenorphine 78%; 30d 34% only heroin, 18% only buprenorphine, 9% only ephedrine, 36% multiple drugs	Ever: 85%, at last injection 6% – 63%	[7 – 10, 13]
Kazakhstan	83%	median 31	mean 6.7		92% heroin		[15]
Kyrgyzstan	82%	median 37	mean 8.6		98% heroin		[15]
Latvia	70%	mean 29.9	mean 9.7	daily 27%	45% heroin, 44% amphetamine	28 d: 31%	[48]
Lithuania	76 – 82%	mean 30	mean 10.4	76 – 91%	Hanka 58%	28 d: 2 – 98%	[48, 92]
Moldova	78% – 87%	14% – 20% <25				last injection: 1% – 2%	[125]
Russian Federation	57% – 83%	mean 20.7 – 29; median 29	48% < = 5 y; mean 5.5 – 9.6; median 8	15% – 92% daily	66 – 100% heroin, 20% methamphetamine	30 d: 8% – 79%	[18, 27, 44, 52, 85, 93, 126, 127, 132, 164, 174, 192 – 194, 196, 197]
Tajikistan	85% – 90%	median 34	mean 4.6 – 11.6 yrs	39.1% daily	98% – 99% heroin	last injection: 37%, 6 m 65%	[15, 41]
Ukraine	74% – 83%	mean 24 – 32.7, median 31	mean 5 – 13	50% – 91% daily	30 d: 79% – 94% hanka; 73 – 78% opiates, 12 – 35% stimulants, 36 – 56% opiate/ sedative mix	30 d: 13% – 22%; 6 m 47% – 52%. Used prefilled syringe in 30 d 55%	[18, 25, 26, 86, 134, 136, 137, 206]
Uzbekistan	87% – 95%	mean 28.7 – 34	mean 5.3		91% heroin	59%	[95, 140]

Notes: d = days; m = months; y = years.

Appendix 3.A.7
Sexual and socio-structural characteristics of study respondents in Western Europe

Country	Inconsistent condom use	Sex work	HIV tested	HCV infection	Income/ employment	Prison/ arrest	References
Finland			12 m: 63% tested and know result				[98]
France			Ever 95%		17.5 – 33% employed; 65% on benefits	Ever 61%	[17, 24, 53]
Germany				82%			[99]
Ireland			Ever: 86%	66%			[101]
Israel				35.7%			[56]
Italy				71.2 – 72%	79% employed (Male: 81%, female 72%)	57% "ever committed a crime"	[22, 23, 61]
Luxembourg						70% at least once in past 10 years	[65]
Spain	13% – 60%	11.5% – 17.9%	Ever 82%	83.4 – 93.5%	Regular income 4.8 – 32.3%	Ever arrested: 11% – 64% In past 12 months 0.5 – 9.1%; Ever for >1 month 43.1%	[20, 64, 102, 103, 105, 106, 177, 178, 201 – 205]
Sweden	40%		12 m: 75%	HIV— PWID: 88%			[62]
Switzerland	28% – 72%	females: 20%	95.80%	78.3%			[108, 180]
United Kingdom			Ever 54%	44% (PWID aged <30, or injecting < = 6 years)		Ever: 66 – 75%	[57, 111, 113]

Notes: m = months; y = years.

Appendix 3.A.8
Sexual and socio-structural characteristics of study respondents in Central Europe

Country	Inconsistent condom use	Sex work	HIV tested	HCV infection	Income/ employment	% prison	References
Albania	last casual sex partner 64%; 12 m: 86%	4.30%	Ever 30%				[141, 142]
Bosnia & Herzegovina	last time had sex: 58% – 73%		Ever: 46 – 77%, of which 36% – 44% in past 12 m			Ever: 2% – 55%	[143, 144]
Bulgaria	last sexual intercourse: 62%	sold sex for money or drugs in past 6 m: 8.4%	12 m (tested and know result): 48%	73.9%	30.7% employed	Ever: 18%	[49]
Croatia			Ever: 83 – 93%				[54]
Czech Republic		0.20%					[97]
Hungary	30 d 89.3%		Ever: 56 – 59%	37%	20.4 – 46.2% work at least part time		[55, 75, 76, 79, 92]
Macedonia	30 d: 56%	30 d: 14%	12 m: 44%				[151]
Montenegro							[152]
Romania	30 d: 76%	Ever exchanged sex for money, drugs or other goods: 13% (male 12%, female 14%)	12 m: 19% tested and received result			Ever: 40%	[184]
Serbia (& Montenegro)	Last time they had sex: 71%	Ever: 5% – 10%	12 m: 22% tested and know result	63%		Ever: 43% – 50%	[42, 154]
Turkey	56%						[156]

Notes: d = days; f = frequency; m = months.

Appendix 3.A.9
Sexual and socio-structural characteristics of study respondents in Eastern Europe & Central Asia

Country	% inconsistent condom use	% sex work	% HIV tested	HCV infection	Income/ employment	% prison	References
Armenia	At last sexual intercourse: 44%		12 m: 23% tested and know result				[115]
Azerbaijan	87% – 98%		12 m: 4.9% tested and know result				[11, 116]
Belarus	6 m: 20%(casual) – 58% (regular)	Female 3%, male 1%					[18, 117]
Estonia	12 m: 60%,	2% – 17%	Ever: 49% – 87%; 12 m: 57%	96%	14 – 57.3% some regular income	Ever in prison: 58% – 66%; new (< = 3 years) injectors 32 – 40%; Ever arrested: 49 – 66%	[47, 48, 70, 71, 96, 119, 121, 187]
Georgia	33% – 74%; UAI at last sex regular partners 79%, casual partners 52%, paid partners 22%	28% paid for sex with median of 3 people	Ever: 11% – 33% tested and know result	58.2 – 70.4%	40% regular income	6% – 21%	[7 – 10, 13]
Kazakhstan	24%	men 14%, women 15%	56%				[15]
Kyrgyzstan	40%	men 4%, women 4%	40%				[15]
Latvia	52%	3%	Ever 72%, 12 m 44%			Ever 45%	[48]
Lithuania	89 – 93%	5%	Ever 95%, 12 m 73%			71%	[48, 92]
Moldova	50% – 67%		32% – 47%				[125]

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Appendix 3.A.9 *(continued)*

Country	% inconsistent condom use	% sex work	% HIV tested	HCV infection	Income/ employment	% prison	References
Russian Federation	12% – 87%; 6 m all partners 59%, casual partners 34%	6%; females: 24% – 32%, males <1% – 5%	Ever 56% – 81%	63.4 – 96%	13 – 49.4% regular income	Ever in prison: 6% – 46% (male 55%, female 19%); Ever arrested 26.5 – 76%; arrested in past 12 m 60.4 – 67.2%	[18, 27, 44, 52, 85, 93, 126, 127, 132, 164, 174, 192 – 194, 196, 197]
Tajikistan	55% – 100%	21% – male 13%, female 31%	15% – 36%	61.3%	20% employed	44.5% ever arrested	[15, 41]
Ukraine	30 d: 38% – 55%; 6m 27% (casual) – 83% (regular)	3.4% – 11%; female 3 – 7%, male <1%	12 m: 26% – 61%	73%	44 – 69% employed	Ever arrested: 58 – 72%	[18, 25, 26, 86, 134, 136, 137, 206]
Uzbekistan	44%	male 18%, female 36%	13%				[95, 140]

Notes: m = months; UAI = unprotected anal intercourse.

Appendix 3.A.10
Summary of multivariate studies for HIV risk factors among PWID in Western Europe derived from systematic review

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Stark et al, 2005 [99]	Germany, Berlin	166 prisoners (117 females, 57 males) reporting having ever injected	Injecting drugs during a previous incarceration*; HCV+*	Adjusted for: Syringe sharing, duration of injecting career, year started injecting
Camoni et al, 2009 [61]	Italy, Nationwide	1,330 people who use drugs, of whom 1,009 (75.9%) ever injected were randomly sampled at public drug treatment centres	Injecting*;	Age*; Area*; Unemployed*; Years of education

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Appendix 3.A.10 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Quaglio et al, 2006 [22]	Italy, Northern	Opiate dependent drug users on OST for at least 6 months of whom 89% reported injecting as their principal route of administration	Duration of injecting career*;	Recruitment centre; Age; Gender; Education; Employment*; Living status; Marital status
Van den Berg et al, 2006 [63] * Outcome is HIV seroconversion	Netherlands, Amsterdam	710 ever PWID who were HIV – at entry to cohort study	Duration of injecting career* HIV status of steady partner* Level of harm reduction accessed*	
Barrio et al, 2006 [102]	Spain, Madrid, Barcelona & Seville	621 heroin injecting users street recruited. Same sample as below	Ever injected with a used syringe*; First drug injected at least weekly*; Ever sniffed with tubes*; Ever been pierced*; Backloaded in past year	Gender*; Ever in prison*; City of residence
De La Fuente et al, 2006 [103]	Spain, Madrid, Barcelona & Seville	628 heroin injecting users street recruited. Same sample as above	*adjusted for; gender, employment, education, prison, and injecting and sexual behaviour risks	Stratified by duration of injecting career: ≤ 5 years: City of residence (AOR ref: Barcelona; Madrid AOR 1.3, 95% CI 0.5 – 3.5; Seville AOR 0.7, 95% CI 0.7, 0.1 – 4.3) > 5 years: City of residence* (AOR ref: Barcelona; Madrid AOR 3.1, 95* CI 1.5 – 6.2; Seville AOR 1.5, 95% CI 0.5 – 4.8)
Hurtado et al, 2008 [105]	Spain, Valencia	5,948 PWID attending VCT and self-identifying	model adjusted for age	Gender Tested in more recent calendar year* Interaction: gender x calendar year*

Notes: * = ; AOR = adjusted odds ratio; CI = confidence interval; OST = opioid substitution therapy; PWID = people who inject drugs; ref = reference; VCT = voluntary counseling and testing.

Appendix 3.A.11 Summary of multivariate studies for HIV risk factors among PWID in Eastern Europe & Central Asia derived from systematic review

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Platt et al, 2006 [161]	Estonia, Tallinn	350 PWID who injected in past 4 weeks recruited by respondent-driven sampling (RDS)	Primary injection of opioid or amphetamine in past 4 weeks*; Duration of injecting career; Shared needle in past 4 weeks; Shared equipment in past 4 weeks;Injected with a used needle of a sex partner in past 4 weeks*; Number of sexual partners in past year	Age; Gender; Main source of income in past 4 weeks; Ethnicity;Ever registered in drug treatment*; Ever been in prison; Ever attended needle exchange
Abel-Ollo et al, 2009 [70]	Estonia, Tallinn and Kohtla-Järve	450 PWID (350 from Tallinn and 100 from Kohtla-Järve) who injected in past 4 weeks recruited by respondent-driven sampling (RDS). For analysis the participants were categorised as HIV-, HIV+ aware of their status and HIV+ unaware of their status, according to self-reported status at the time of testing. The data from Tallinn is also analysed above.	Analysis of risk factors for HIV among participants aware of their status (ref HIV-participants): Sharing used needles/ syringes in past 4 weeks*; Unprotected sex in past 4 weeks; Sharing water*; PWID as sex partner in past year*; Sharing injection equipment with sexual partner in past year*; Having 2 or more sex partners in past year; Unprotected intercourse in past year; Ever sharing needles with HIV+ person*. Analysis of risk factors for HIV among participants unaware of their status (ref HIV-participants): Sharing used needles/ syringes in past 4 weeks; Unprotected sex in past 4 weeks; Sharing water; PWID as sex partner in past year; Sharing injection equipment with sexual partner in past year; Having 2 or more sex partners in past year*; Unprotected intercourse in past year*; Ever sharing needles with HIV+ person.	
Uusküla et al, 2010 [121]	Estonia, Tallinn	350 PWID, aged 18+, who injected in past 2 months recruited by RDS	Earlier age of initiation to injecting*; Primary injection of opioid or amphetamine*; Receptive sharing in past 6 months*	Ever attended syringe exchange*; Main source of income other than work*; Unemployment at habitat level*; Residential change at habitat level*
Platt et al, 2005 [90]	Russia, Togliatti	268 male PWID who injected in past 4 weeks recruited in 2001 by outreach workers	Duration of injection; Injected with used paraphernalia in past 4 weeks*; Injected with used needle in past 4 weeks; Ever injected homemade drugs; Injected with used needle from someone known to be HIV+; Injected with used needle from someone known to be HCV+*; Unprotected anal or vaginal sex with a regular partner in past 4 weeks; Unprotected anal or vaginal sex with a casual partner in past 4 weeks*; Ever had an STI	Ever been in prison; Ever been in drug treatment; Ever been arrested;

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Appendix 3.A.11 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
	Russia, Togliatti	89 female non-sex worker PWID who injected in past 4 weeks recruited in 2001 by outreach workers	Duration of injection; Injected with used paraphernalia in past 4 weeks; Injected with used needle in past 4 weeks*; Ever injected homemade drugs; Injected with used needle from someone known to be HIV+; Injected with used needle from someone known to be HCV+; Unprotected anal or vaginal sex with a regular partner in past 4 weeks; Ever had an STI	Ever been in prison; Ever been in drug treatment; Ever been arrested
	Russia, Togliatti	66 female sex worker PWID who injected in past 4 weeks recruited in 2001 by outreach workers	Duration of injection; Injected with used paraphernalia in past 4 weeks; Injected with used needle in past 4 weeks; Ever injected homemade drugs*; Injected with used needle from someone known to be HIV+; Injected with used needle from someone known to be HCV+; Unprotected anal or vaginal sex with a regular partner in past 4 weeks; Ever had an STI	Ever been in prison; Ever been in drug treatment; Ever been arrested;
Platt et al, 2008[162]	Russia, Togliatti	230 PWID (134 in 2001 from the study above, and 96 from 2004) who reported injecting for 3 years or less and injected in past 4 weeks were recruited by outreach workers in 2001 and through RDS in 2004	Duration of injecting career*; Frequency of injection; Ever injected homemade drugs; Injected with used needles i past 4 weeks; Used a previously used filter; Frontloading in past 4 weeks*; Injected with a prefilled syringe; Frequency of reusing the same needle; Ever exchanged sex for money, drugs or goods*; History of STIs	Year of study*; Gender; Age; District of residence; Education; Main source of income in past 4 weeks; History of prison; Police arrest in past year; Ever in drug treatment*; Main source of needles in past 4 weeks; Ever been tested for HIV
Kozlov et al, 2006 [85] *outcome is HIV incidence at 12 month follow up to enrolment	Russia, St Petersburg	520 sero-negative PWID enrolled in cohort study who injected at least 3 times / week in past month or reused another's injecting equipment at least 3 times in past 3 months	Frequency of injecting psychostimulants*; Number of sex partners in past 6 months; Selling sex for money or goods in past 6 months	
Niccolai et al, 2010 [164]	Russia, St Petersburg	387 ever injectors were enrolled through RDS	Unsafe injection in past 30 days*; Has STI*;	Unemployed*

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Appendix 3.A.11 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Rhodes et al, 2006 [93]	Russia, Moscow	455 PWID who injected in past 4 weeks recruited by outreach workers	Duration of injecting career; Last day injected, number of times injected*; Frequency of injection; Main drug injected in past 4 weeks; Injected with used needle in past 4 weeks; Shared paraphernalia in past 4 weeks; Ever injected with used needles*; Number of sex partners in past year; History of STI*	Gender; Age; Education; Main source of income in past 4 weeks; Ever been in prison*; Ever registered as a drug user*
	Russia, Volgograd	517 PWID who injected in past 4 weeks recruited by outreach workers	Duration of injecting career; Frequency of injection*; Ever injected homemade drugs; Injected with used needle in past 4 weeks; Shared paraphernalia in past 3 weeks; Ever injected with used needles; Injected with needle previously used by sex partner in past 12 months*; Number of sex partners in past year; History of STI	Gender; Age; Education; Main source of income in past 4 weeks*; Ever registered as a drug user
	Russia, Barnaul	501 PWID who injected in past 4 weeks recruited by outreach workers	Duration of injecting career; Last day injected, number of times injected*; Frequency of injection; Main drug injected in past 4 weeks; Ever injected homemade drugs; Injected with used needle in past 4 weeks; Shared paraphernalia in past 4 weeks*; Filled syringe from working syringe in past 4 weeks; Ever injected with used needles; Number of sex partners in past year; History of STI	Gender; Age; Education; Main source of income in past 4 weeks; Ever been in prison; Ever registered as a drug user
Beyrer et al, 2009 [41]	Tajikistan, Dushanbe	419 PWID who injected in past month aged 17 or over recruited through snowball technique	Daily injection in past 6 months*	Ethnicity* Model adjusted for gender
Stachowiak et al, 2006 [163]	Tajikistan, Dushanbe	207 ethnic Tajik PWID (subsample of above) aged 17 or over recruited through snowball technique	Injecting at least daily for past 6 months*; Less than 3 years since initiation of injection; Injects 'alone'*; Injected with used needle in past 6 months	Reports narcotics 'very easy' to obtain*; Ever experienced drug treatment*
Booth et al, 2006 [134]	Ukraine, Kiev, Odessa, Makeevka/ Donetsk	778 PWID aged 18+ who injected in past 30 days and were unaware of their HIV status recruited through outreach workers	Injected sedative/ opiate mix in past 30 days*; Daily injection in past 30 days*; Sex in past 30 days*; Sex with HIV+ or unknown status partner in past 30 days*	Age*; Gender*; City of origin*
Dumchev et al, 2009 [25]	Ukraine, Vinnitsya	268 PWID aged 18+ who report at least 3 injections in past 30 days and have lived in Vinnitsya for past year, recruited through snowball sampling	Shared needles with HIV+ person in past year*; Inject opiates daily*	HIV knowledge score*
Taran et al, 2011[26]	Ukraine, 16 cities	3,487 PWID aged 16+ who injected in past 30 days and were recruited through RDS	Type of drug injected in past month; Duration of injecting career*; Injecting frequency in past month; Used alcohol with drugs in past month*; Shared needle at last injection*; Frequency of sharing paraphernalia in past month*; Sexual contact in past year;	Gender*; Marital status; Occupation*; Education*

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Appendix 3.A.11 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Sanchez et al, 2006 [138]	Uzbekistan, Tashkent	701 self-identified PWID aged 18+available for 2 weeks after enrolment by outreach workers	Age at first drug use; First illicit drug of use*; Duration of injecting career; Current heroin use; Injecting frequency; Poppy-straw use; Group drug use; Sharing needles; Own syringe; Blood transfusion; STI history; Hepatitis history*; TB history; STI symptoms; Sell sex for drugs; Condom use*; Number of sexual partners in past month	Age; Gender; Nationality; Marital status; Employment status*; Education status; Needle exchange programme; AIDS knowledge; protection for AIDS; Donated blood for money*

Notes: PWID = people who inject drugs;

Appendix 3.A.12
Summary of HIV prevalence among samples of sex workers in West Europe

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Austria	Vienna	FSW recruited from STI clinics	N/A	N/A	2002	1%	Low	1,184	[107]
		Registered FSWs				0%		642	
		Illegal FSW				4%	Medium	246	
		Unregistered FSWs working in bars				0%		296	
Belgium	Antwerp	SWs	N/A	N/A	2008	0%	Low	1,016	[64]
France	Paris	Chinese sex workers	N/A	100%	2008	0%	Low	46	[64]
	London	Recruitment at specialist sex work clinic	11%	33% migrants	1986 – 1993 and 1997 – 2000	0.00%	Low	130	[108]
	London (East)	Female street workers	92% heroin/ crack		2004	4.10%	Medium	24	[83]

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Appendix 3.A.12 (*continued*)

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
United Kingdom	London (East)	Female street workers, drug users (crack, heroin) recruited via outreach work	96% (crack, heroin, cocaine)	28% (Somalian, European, West Indian)	2006 – 2007	24.00%	Very high	25	[6]
	London	FSWs and migrant SWs from Eastern Europe recruitment at specliast sex work clinic	4.4% IDU	60.8% EE/FSU migrants	2008 – 2009	1.10%	Low	268	[109]
	Scotland	FSW recruited from VCT sites, STI clinics, hospitals	N/A	N/A	2002	0.00%	Low	103	[107]
Germany	National (multi-site)	FSWs recruited throughs STI clinics VCT sites and private clinics	N/A	N/A	2002	0.30%	Low	290	[107]
	National (multi-site)	FSWs recruited throughs STI clinics VCT sites and private clinics	5% (n = 518)	63% (n = 1425)	2010 – 2011	0.20%	Low	3880	[69]
Greece	Athens	FSWs applying for official licence to work as sex workers recruited at STI clinic (migrants and non)	0 Drug use	19.7% Migrants (Ukraine, Georgia, Russia, Bulgaria, Romania, Albania)	2005	0%	Low	299	[20]
Italy	Bolgona	Street migrant FSWs attending STI clinic	N/A	76% Eastern Europe	1995 – 1999	1.60%	Low	558	[100]
	Rome	Female migrant SWs attending and HIV testing site	8.9% cocaine users	N/A	1992 – 2007	5%	High	229	[91]
	Sicily	Migrant street-based sex workers recruited via outreach workers	0 reported using illegal substances	64.4% Colombian 35.6% Dominican	2001 – 2002	0%	Low	118	[67]
Italy	Palermo	Migrant sex workers recruited from the street			2008	8%	High	123	[71]

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Appendix 3.A.12 (*continued*)

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
The Netherlands	Rotterdam, The Hague	FSWs recruited from work settings	0	75% Migrants	2002 – 2005	1.50%	Low	399	[19]
		Female drug users	52%	65% Migrants		13.6 %	High	88	
		All FSWs	16%	76% Migrants		5.7%	High	557	
	National (multi-site)	FSWs	N/A		2005	0.50%	Low	1018	[107]
Norway	Oslo	STI clinic for sex workers (includes MSWs)	N/A	N/A	2008	1.00%	Low	746	[64]
Portugal	Lisbon	FSWs recruited from street including migrants and IDUs	50 – 60% cocaine/ heroin	51% migrants	2000 – 2001	13.50%	High	96	[108]
Spain	Madrid	Immigrant FSWs, transexuals (60) and MSW (3) recruited from work settings	N/A	75% Sub Saharan Africa, 18% Central and South America, 6% E. Europe	1998 – 2003	5.2%	High	762	[65]
		Female African sex workers				4.5%	Medium	574	
		Ecuador (MSW=62)		100% Ecuador		11%	High	128	
	Madrid, Alicante, Bilbao, Pamplona, Oviedo, Gijon	Female sex workers (largely migrants)	0.6%	83.3% migrants (83% from LA, 8% EE, 5% SSA, 2% N/A	2000 – 2001	0.7%	Low	3149	[27]
		Injecting drug users				15.8	High	19	[92]
	Barcelona	Female street-based sex workers	N/A	95% migrants (31% LA, SSA 25% EE 24%)	2002 – 2003	1%	Low	301	[21]

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Appendix 3.A.12 (*continued*)

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Spain	Barcelona	Female Migrant Sex workers recruited at work	1	100% migrants (Eastern Europe, Africa, Latin America)	2003 – 2004	0.8%	Low	357	[28]
Sweden	Stockholm region	Recruited in prison	N/A	N/A	2006/2007	2.2%	Medium	45	[64]
Israel	2 locales in Israel	FSWs who had entered Israel illegally and were working without permit	N/A	100% EE/FSU		0%	Low	43	[9]
	Tel Aviv	Female brothel workers (except for 12 street workers)		89.6% migrants from FSU		0.3%	Low	300	[66]

Note: EE = Eastern Europe ; FSU = fomer Soviet Union; FSW = female sex worker; MSM = male sex worker; LA = ; SSA = ; N/A = not applicable.

Appendix 3.A.13
Summary of HIV prevalence among samples of sex workers in Central Europe

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Albania	Tirana	Female sex workers working on the street and in bars			2008	1.10%	Low	90	[110]
Bosnia & Herzegovina	No info	FSWS			2007	0	Low	42	[111]
Bulgaria	8 cities	MSW (16%) and FSWs recruited from street, brothels			2005	1.0	Low	874	[112]
					2008	0.63	Low	799	[113]
Croatia	ijeka, Split, Zagreb, Osijek, Slavonski Brod, Zadar and Dubrovnik	SWs recruited through NGO			2003 – 2005	2.3%	Medium	43	[114]

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Appendix 3.A.13 *(continued)*

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Czech Republic	Cheb, Usti nad Labem, Ostrava	FSWs	10%	40% (non-Czech)	1999 – 2000	0.7%	Low	585	[115]
	Prague and two regions	FSWs recruited from street				0.1%	Low	797	[107]
Macedonia (FYR)	National	Female sex workers	N/A	N/A	2005	0% (0)	Low	48	[116]
					2006	1.9%		51	
					2007	0% (0)		67	
Hungary	No info	Sex workers screened at bus pilot programmes	N/A	N/A	2006	0	Low	500	[64]
Montenegro	No info	Female and Male sex workers (MSWs=14)	N/A	N/A	2007	0.76%	Low	133	[117]
Poland	13 cities	SWs recruited from clinic and community	2%		2002 – 2005	0 – 2%	Low	650	[107]
	National (multi sites)	SWs recruited from VCT sites, STI clinics and hospitals			2005	0%	Low	250	[107]
Romania	Bucharest	Street sex workers	N/A	N/A	2006	1%	Low	204	[64]
Serbia	Belgrade	Female (62%) Male (22%) Transsexuals (16%)	27%		2010	0.8%	Low	250	[118]
Serbia (Kosova)	Ferizaj/ Urosevac/ Prizren	Street/Indoor mostly migrants (Bulgaria, Albania, Moldova, Ukraine)	1.3% IDU in last 12 months	34% Bulgaria, 28% Albania, 16% Moldova and 9% Ukraine	2006	0% (0)	Low	157	[119]
Turkey	Ankara, Istanbul, Izmir	Unregistered FSWs		26%	2006 – 2007	0.8%	Low	252	[120]

Source:
Notes: FSW = female sex worker; MSM = men who have sex with men; LA = ; SSA = ; N/A = not applicable.

Appendix 3.A.14
Summary of HIV prevalence among samples of sex workers in East Europe

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Armenia	National	Female sex workers recruited through VCT sites and STI clinics	1.20%		2000	1.2%	Low	168	[107]
		Female sex workers recruited from street and VCT sites	0.40%		2005	0.4%	Low	250	[107]
	Yerevan, Shirak, Lori, Gegharkunik, Syunik.	Female sex worker			2007	0.4%	Low	?	[121 – 122]
Azerbaijan	Baku, Gandja, Sumgait	Sex workers			2007 – 2008	2.5% (all cases in Baku)	Medium	300	[123]
		Street-based and indoor sex workers	<1% used drugs in last month	4% migrants from Russia	2003	8.50%	High	200	[124]
Belarus	Gomel, Mogilev, Brest, Grodno, Vitebsk, Minsk.	Female sex worker recruited from the street and STI clinics			2004	0%, 0.98±0.5	Low	208	[107]
	7 areas				2004, 2006, 2009	0%	Low	481	[125]
	Minsk	FSW	15.50%		2009	6.40%	High	453	[125]
Estonia	Talinn	FSWs recruited via chain referral	6.60%	0	2005/06	7.6%	High	227	[36]
Georgia	Tblisi	Sex workers recruited through TLS	1.3%	20%	2002	0.0%		153	[35]
			5.6%	22%	2004	1.3%		158	

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Appendix 3.A.14 *(continued)*

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Georgia	Batumi	Sex workers recruited through TLS	1.8%	13%	2006	0.6%		160	
					2009	1.9%	Low	160	[78]
			1.7%	18%	2004	0.0%		120	[35]
			5.8%	13%	2006	0.1%		114	
					2009	0.8%	Low	120	[78]
Latvia	Riga	FSWs			2002	16.00%	High	92	[107]
	Riga and regions		53% IDU		2004	18.00%	High	93	[107]
Lithuania	Vilnius	FSW recruited from street			2005	0.00%	Low	101	[107]
	No info	FSWs recruited at Lithuanian AIDS Centre			2007	0.00%	Low	67	[126]
Moldova	Chisinau		11.2% IDUs	1.3% from Moldova, rest from Russia	2001	4.60%	Medium	151	[124]
		SWs recruited through harm reduction programmes			2004	8.50%	High	151	[127]
					2007	2.90%	Medium	242	
		SWs recruited through RDS			2009	6.10%	High	300	
Russian Federation	Moscow	Street -based female sex worker	4.80%	75%	2002	14.1%	High	147	[124]
	St Petersburg	Street -based female sex worker IDUs	97.20%	11%	2003	48.1%	Very high	109	
	Ekaterinburg	Street/Flat based female sex workers	27.30%	43.50%	2003	14.8%	High	151	

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Appendix 3.A.14 *(continued)*

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Russian Federation	Moscow	IDU sex workers recruited from community settings	100%	82%	2003	13.3% (4/30)	High	34	[82]
	Volgograd		100%	20.60%	2003	2.9% (1/34)	Medium	36	
	Barnaul		100%	20.70%	2003	6.1%(2/33)	High	34	
	Togliatti	IDU sex workers recruited from community settings	100%	13%	2001	62.1%	Very high	66	[13]
	Togliatti		100%		2005	57.8%	Very high	38	
	Moscow	SWs recruited on the street			2000	15%	high	170	[107]
	Nizhny Novgorod	CSWs			2006	5.80%	High	200	[81]
	Krasnoyarsk	CSWs			2007	8%	High	200	
	Tomsk	CSWs			2007	2%	Medium	200	
	Chelyabinsk	CSWs			2007	6%	Medium	200	[128]
	Irkutsk	CSWs			2008	20%	Very high	201	
	Moscow	SWs recruited at STI clinic			2009	4.50%	Medium	750	
	15 Russian cities	CSWs	30%		2009	4.50%	Medium	1777	
Ukraine	Donetsk, Lutsk, Nikolaev, Odessa, Poltava, Simferopol, Kharkiv.	FSW recruited from street			2002	20%	Very high	646	[107]
	23 cities	FSW recruited from community			2008/2009	13.20%	High	3284	[129]

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Appendix 3.A.14 *(continued)*

Country	Area	Population sampled	Injecting drug use	Migrants	Survey Year	HIV Prevalence	Category	n	References
Ukraine	16 cities	FSW recruited from community	24% ever used drugs 15% IDU in last 30 days	39% internal migrants	2009	12.90%	High	2278	[130]
Kazakhstan	?	SWs recruited from community settings, sold sex in last 6 months	9.80%		2006	2.50%	Medium		[88]
			18.20%		2007	2.20%	Medium		
			12.30%		2008	1.40%	Low		
			11.10%		2008	1.30%	Low	2249	
	National	FSWs recruited from STI clinics				0.10%	Low	3,903	[107]
	19 cities	FSWs recruited from the street/STI clinics	12%		2005	2.10%	Medium	1,960	[107]
Kyrgyzstan	Bishkek, Osh	Female sex workers in last 6 months	4.8%		2006	1.4%	Low	352	[88]
			2.3%		2007	1.3%	Low		
			0.5%		2008	1.9%	Low		
			0.4%		2008	1.6%	Low		
Tajikistan	5 regions	Female sex workers	0.3%		2006	3.7%	Medium	1200	
			1.50%		2007	1.6%	Low		
			1.70%		2008	2.8%	Medium		
			1.50%		2008	2.7%	Medium		
Uzbekistan	Samarkand	FSWs and MSWs	5%		2004 – 2005	6.20%	High	372	[85]
	Tashkent	FSWs	9%		2003 – 2004	10% (45/448)	High	448	[84]
		FSWs IDU	100%			58.50%	Very high	41	
		FSWs nonIDU	0%			5.20%	High	407	
	Multi-sites	FSWs			2005 – 2007	4.70%	Medium	2000	[89]

Notes: FSW = female sex worker; IDU = injecting drug user; LA = ; MSM = men who have sex with men; n = sample size; N/A = not applicable; SSA = Sub-saharan Africa; SW = sex worker; TLS = time located sampling.

Appendix 3.A.15
Summary of HIV prevalence among samples of Male and transgender sex workers

Country	City	Population sample	Migrant	IDU	Survey Year	HIV Prevalence	Category	n	References
Belgium	Antwerp	MSWs recruited through outreach	72% (West and East Europe, South Africa, Middle East/North America)	5%	1999/2004	10.80%	High	120	[95]
Czech Republic	Cheb, Usti nad Labem, Ostrava, Prague	MSW	7% (Ukraine, Russia, Bulgaria)	38%	1999 – 2003	0.9%	Low	1480	[115]
			N/A	N/A					[107]
Italy	Rome	MSW/Transgender	80 – 96% (mostly South America)	8.9% cocaine	1992 – 2007	23.00%	Very high	752	[91]
	Brescia	Transgender	100% (South American)	N/A	2002 – 2004	27.00%	Very high	85	[90]
The Netherlands	Rotterdam, The Hague	Transgender	96% (mostly South American)		2002 – 2005	18.80%	High	70	[19]
Russian Federation	Moscow	MSW	84% internal migrants	8%	2005 – 2006	16%	High	50	[55]
Spain	19 cities	MSW and Transgender	67% migrants (mostly south american)	3.30%	2000 – 2002	12%	High	418	[92]
Spain	19 cities	MSW and Transgender	70%	2%	2000 – 2007	9.9%	High	1935	[131]
United Kingdom	London	MSWs recruited at STI clinics	62.8% (SA, SSA, WE, EE, Australia)	26.70%	1994 – 2003	8.90%	High	636	[86]
					2003	9.3%	High	257	[107]

Notes: Eastern Europe; FSW = female sex worker; IDU = injecting drug user; LA = Latin America; MSM = men who have sex with men; n = sample size; N/A = not applicable; SA = South Asia; SSA = Sub-saharan Africa; WE = Western Europe.

Appendix 3.A.16
Prevalence of HIV and Syphilis among samples of male and transgender sex workers

Country	City	Population	HIV (%)	Syphilis (%)	n	Year	Reference
Italy	Brescia	Trans	27	14	86	2002 – 2004	[90]
United Kingdom	London	MSW	9	21	746	1994 – 2003	[86]
Belgium	Antwerp	MSW	10.8	12.5	120	1999/2004	[95]
Spain	Madrid	Trans	22.6	30.6	62	1998 – 2003	[65]

Notes: FSW = female sex worker; IDU = injecting drug user; MSW = male sex worker; Trans = transgender.

Appendix 3.A.17
Prevalence of HIV and Syphilis among samples of female sex workers

Country	City	Population	HIV (%)	Syphilis (%)	n	Year	Reference
Albania	Tirana	FSW	1.1	6	90	2011	[110]
Bulgaria	8 cities	FSW	1	10	799	2005	[113]
Serbia	Belgrade	FSW, MSW, Trans	1	4	250	2010	[118]
Kyrgyzstan	Bishkek, Osh	FSW	1.4	34.9	352	2006	[132]
Azerbaijan	Baku, Gandja, Sumgait	FSW	3	9	200	2001	[124]
Moldova	Kishinev	FSW inc IDUs	5	12	148	2001	
Russia	Moscow	FSW inc IDUs	14	26	147	2001	
	Ekaterinburg	FSW inc IDUs	15	22	151	2001	
	Moscow, Volgograd, Barnaul	FSW inc IDUs	7	16	98	2003	[14]
Italy	Bologna	FSW inc migrants	2	12	558	1995 – 1999	[100]

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Appendix 3.A.17 *(continued)*

Country	City	Population	HIV (%)	Syphilis (%)	n	Year	Reference
Greece	Athens	FSW inc migrants	0	18	299	2005	[20]
United Kingdom	London	FSW inc migrants	1	2	268	2007 – 2008	[109]
Spain	Madrid	FSW inc migrants	0	3	66	1998 – 2003	[65]
Ukraine	15 cities	FSW inc IDUs	12.9	4.4	2278	2009	[130]
Georgia	Tblisi, Batumi	FSWs inc IDUs	0.4	34.1	985	2002 – 2006	[133]
Turkey	Ankara, Istanbul, Izmir	FSWs (unregistered)	0.8	7.5	252	2006 – 1007	[120]

Notes: FSW = female sex worker; IDU = injecting drug user; MSW = male sex worker.

Appendix 3.A.18
Prevalence of Chlamydia and Gonorrhoea among samples of female sex workers

Country	City	Population	Chlamydia (%)	Gonorrhoea (%)	n	Year	Reference
Israel	Tel Aviv	FSWs (indoor)	6	5	300		[66]
Turkey	Gazaniantep	FSWs (registered)	5		92	1997 – 1998	[134]
Turkey	Ankara, Istanbul, Izmir	FSWs (unregistered)	1.2	2.8	252	2006 – 2007	[120]
United Kingdom	London	FSWs inc migrants	4	2	233	2008 – 2009	[109]
Belgium	Ghent	FSWs inc migrants	7		950	1998 – 2003	[93]
Italy	Bologna	Migrant FSws	6	1	558	1995 – 1999	[100]
	Brescia	Migrant FSws	14		101	1998 – 2000	[29]
Spain	Barcelona	FSWs (street)	5	4	301	2002 – 2003	[21]
Serbia (Kosova)	Ferizaj/Urosevac/Prizren	Migrant FSWs (street/indoor)	45		153	2006	[119]
Georgia	Tblisi	FSWs (street)	23	18	160	2002 – 2006	[133]
	Batumi	FSWs (indoor)	22	12	160	2004 – 2006	[133]

Notes: FSW = female sex worker; IDU = injecting drug user; MSW = male sex worker.

Appendix 3.A.19
Demographic characteristics, harms associated with sex work and HIV testing among samples of male and transgender sex workers

Country	City	n	Year	Recruitment location	Population	Age	Condom use with clients	Condom use with non-paying partners	Testing for HIV	Violence	Ref.
The Netherlands	Rotterdam, The Hague	70w	2002 – 2005	Drug relief centre and community settings	Transgender	median = 30 (26 – 37)	inconsistent = 26%	inconsistent = 81% (steady partners) 50% (casual partners)	82% ever tested	N/A	[19]
Spain	National	418	2002	22 HIV/STI counselling and testing clincis	MSW, Transgender (18%)	Mean = 29.2 SD = 7.3			100%		[92]
		1935	2000 – 2007	19 HIV/STI counselling and testing clincis	MSW, Transgender	Mean = 29.7 SD = 7.8					[131]
United Kingdom	London	636	1994 – 2003	Targeted sexual health clinic		mean = 25.4 years (15 – 59)	96% reproted consistent condom use for anal sex with last 4 clients;	19% (10/52) unprotected vaginal sex; 37% of MSW (128/319) did used condoms for anal sex with regularmale partner			[86]
Belgium	Antwerp	120	1999 – 2004	Street, red light district	MSW (all transvestite or transexual)	Median=26.5 Range=12 – 58		79.1% always used condoms for anal intercourse			[95]
Czech Republic	Cheb, Usti nad Labem, Ostrava, Prague	1480		Community and via specialist project	MSW	Mean = 22.9 Range = 18 – 54					[115]
Russian Federation	Moscow	50	2005 – 2006	Community settings via RDS, outreach workers	MSW	36% aged between 17 and 20 years				28% ever experienced violence from clients	[55]

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Appendix 3.A.19 *(continued)*

Country	City	n	Year	Recruitment location	Population	Age	Condom use with clients	Condom use with non-paying partners	Testing for HIV	Violence	Ref.
Italy	Brescia	85	2002 – 2004	STI clinic	Transgender	mean = 27.8 years	79% regular condom use				[90]
	Rome	65	1992 – 2007	HIV clinic	MSW		69% regular condom use with clients				[91]
		602			Transgender		76% regular condom use with clients				

Notes: SD = ; MSW = male sex worker.

Appendix 3.A.20
Demographic characteristics, harms associated with sex work and HIV testing among samples of Female Sex workers in Europe

Country	City	Year	Recruitment location	Location of sex work	Age	% Drug use	% Migrants	Condom use with clients	Condom use with non paying partners	Violence	HIV testing	Ref.	No. studies
Greece	Athens	2005	STI HIV Clinic	Brothels	39.7	0 Drug use	19.7% Migrants (Ukraine, Georgia, Russia, Bulgaria, Romania, Albania)	N/A		N/A	Mandatory ever 15 days in order to obtain permit	[20]	1
Israel	Tel Aviv, 2 sites		Community settings	Brothels	22 – 27		Mostly migrants from FSU	<5% reporting inconsistent condom use with clients				[66]	2

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Appendix 3.A.20 *(continued)*

Country	City	Year	Recruitment location	Location of sex work	Age	% Drug use	% Migrants	Condom use with clients	Condom use with non paying partners	Violence	HIV testing	Ref.	No. studies
Italy	Milan, Catania, Brescia	1999 – 2003	Work settings and STI clinics	89%-100% street	23 – 38	No IDU reported	91%-100% migrants	12 – 16% reported not using a condom with clients	84% reported not using condoms with stable partner	N/A	N/A	[7, 29, 67]	3
Spain	National	2000 – 2005	STI clinics, SW services, work	31.4%-100% street	28 – 38	<1% IDUs	83%-100% migrants	<5% reporting not using a condom with clients; 90% reporting non-condom use with non-paying partners		N/A	N/A	[21, 27 – 28]	3
The Netherlands	Rotterdam, The Hague	2002 – 2005	Drug relief centre and community settings	24% Street	30	No IDU reported	75% migrants (Africa, SE, LA)	inconsistent = 11%	inconsistent = 89% (steady partners) 65% casual partners	N/A	82% ever tested	[19]	1
United Kingdom	London	2000 – 2009	Clinic and work settings	70% indoors	26 – 27	4%-11% ever IDU	33%-60% migrants	<1% did not use condom last time had vaginal sex with client; partner	69.3% did not use condoms last time had vaginal sex with a non-paying	30.2% experience violence from clients in the last 12 months	37% tested for HIV in last 12 months	[108 – 109]	2
Bosnia & Herzegovinia	No info	2007	Cross-sectional bio-behavioural survey	HIV							28.8% ever HIV tested 13.6% tested in the last 12 months	[111]	1

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Appendix 3.A.20 *(continued)*

Country	City	Year	Recruitment location	Location of sex work	Age	% Drug use	% Migrants	Condom use with clients	Condom use with non paying partners	Violence	HIV testing	Ref.	No. studies
Bulgaria	8 cities	2008	Cross-sectional bio-behavioural survey								58.3% report having a test and knowing the result	[113]	1
Croatia	Zagreb and Split	2006 – 2008	Community recruitment	46 – 49% street		9.2 – 55% IDU		<5% reporting no condom at last commercial sex		30 – 52% report physical abuse from client in last year	78.5%-91% ever tested for HIV	[54]	1
Czech Republic	Cheb, Usti nad Labem, Ostrava	1999 – 2000	Community settings		24.8	10% ever IDU	40% migrants					[115]	1
Kosova	Ferizaj/ Urosevac/ Prizren	2006	Clinic recruitment	Street and indoor sex workers	28	1.3% IDU in last 12 months	34% Bulgaria, 28% Albania, 16% Moldova and 9% Ukraine	38% never used condoms with clients in last 30 days	45% reported never using condoms with non-paying partners in last 12 months.	16% forced to have sex against their will in last 12 months	40% ever tested	[119]	3
Romania	Bucharest, Constanta, Timisoar	2008	Community settings via key informants	Street	Range 15 – 24	22.2% ever injected		35% reported inconsistent condom use with clients in last 12 months	52 – 60% report not using conodm with regular partner	46% forced to have sex in the last 12 months	52% ever had an HIV test	[135]	1
Serbia	Belgrade	2006 – 2010	Community recruitment	Street and indoor		12.8% – 27% IDU	42.5% – 55.1% Roma	<11% reporting not using condom at last commercial sex				[118, 136]	2
Turkey													

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Appendix 3.A.20 *(continued)*

Country	City	Year	Recruitment location	Location of sex work	Age	% Drug use	% Migrants	Condom use with clients	Condom use with non paying partners	Violence	HIV testing	Ref.	No. studies
	Gaziantep, Manisa and Izimir	1997 – 2006	Clinic recruitment		Range 21 – 74	2% ever used illegal drugs		38% did not always use a condom with clients				[16, 134]	3
	Istanbul, Ankara, Izmir	2006 – 2007	Peer recruitment					29% did not use a condom with last client				[120]	1
Armenia	Yerevan	2007 – 2008	Community settings	100% Street	33.7	no illegal drugs, 96.7% reported alcohol		32.5% inconsistent condom use in last 7 days for vaginal sex		30% ever forced to have sex		[137]	1
Azerbaijan	Baku	2003	Community settings	50%	64.5% aged 20 – 30 years	<1% used drugs in last month	4% migrants from Russia	78% did not use condoms with clients	86% did not use condoms with regular partners		13% test for HIV last 12 months	[124]	1
Estonia	Tallinn	2005 – 2006	Community settings via RDS, TLS		29.5	6.6% IDUs		25% did not always use condoms for vaginal and anal sex with clients			65.5% had ever been tested for HIV	[36]	1

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Appendix 3.A.20 *(continued)*

Country	City	Year	Recruitment location	Location of sex work	Age	% Drug use	% Migrants	Condom use with clients	Condom use with non paying partners	Violence	HIV testing	Ref.	No. studies
Georgia	Tblisis, Batum	2002 – 2009	Community setting	100%	21 – 32	6% IDU	10 – 20%	10% inconsistent condom use with clients,	90% inconsistent with non-paying partners; 19% did not use condom for last sex	17.7%, 29%, 26.9% experience physical/ sex violence during last year (Tblisi) 13% physical violence (Batumi)	52% ever tested for HIV (Tblisi)	[78]	6
Lithuania	Vilnius	2008	Women's Health site at Lithuanian AIDS Centre	No info.	27.5			8% did not use a condom with last client			53.4% had been tested for HIV in last 12 months and knew result	[126]	1
Moldova	Kishinev	2003 – 2010	Community recruitment, RDS	100%	23 – 25	11.2% IDUS	99% migrants from Russia	17% did not use condom with last client		53.4% experience violence or been threatened by client	13.9% tested for HIV over last 12 months	[124, 127]	2

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Appendix 3.A.20 *(continued)*

Country	City	Year	Recruitment location	Location of sex work	Age	% Drug use	% Migrants	Condom use with clients	Condom use with non paying partners	Violence	HIV testing	Ref.	No. studies
Russian Federation	Moscow, Saratov, Samara, Ekaterinburg, Chelyabinsk, Irkutsk	2001 – 2003	Community recruitment, RDS	Mostly street	20 – 25	4.8%-14% ever injecting	7%-100% internal migrants	0 – 32.4% did not use a condom with last client		19.7%-76% reporting some kind of sexual or physical violence from a client in the last year	37.8%-57% ever tested for hIV	[52, 124, 138]	5
Ukraine	National	2003 – 2009	Community via NGO	Mostly street	23.1	71% ever IDU 59% regular		12 – -44% did not use a condom for last sexual contact			59% tested for HIV in last 12 months and know results	[129, 139]	2
		2009	TLS	43.4% street	26	24% ever used drugs 15% IDU in last 30 days	39% internal migrants	10% did no use condom for last sexual act with client	42% did not use condom for last sexual act with permanent partner		56% tested for HIV in last 12 months and know results	[130]	
Uzbekistan	Tashkent & Samarkand	2003 – 2005	Community settings via NGO	2.3%-47.5% street	25 – 27	5.30%					83.9% ever tesed for HIV	[85, 140]	2
Kyrgyzstan	Bishkek & Osh	2006 – 2009	Community settings		25 – 26	0.4%-5.0% IDU		<20% reporting non-condom use with clients for last sex act 20% – 50% reporting non-condom use with regular partner			42.5%-55.7% tested in last 12 months voluntarily	[88]	4

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Appendix 3.A.20 *(continued)*

Country	City	Year	Recruitment location	Location of sex work	Age	% Drug use	% Migrants	Condom use with clients	Condom use with non paying partners	Violence	HIV testing	Ref.	No. studies
Kazakhstan	Mult-sites	2006 – 2009	Community settnigs		25 – 27	7.1%-9.8% IDU		<20% reporting non-condom use with clients for last sex act 20% – 50% reporting non-condom use with regular partner			61.2%-76.4% tested in last 12 months voluntarily	[88]	4
Tajikistan	Multi-sites	2006 – 2009	Community settings		26 – 31	4.0%-6.3% IDU		<30% reporting non-condom use with clients for last sex act			26.7%-55.0% tested in last 12 months	[88]	4

Notes: FSU = former Soviet Union; IDU = injecting drug user; info. = information; LA = Latin America; MSW = male sex worker; NGO = non government organisation; Ref. = reference; SE = standard error; TLS = time location sampling; RDS = respondent driven sampling.

Appendix 3.A.21
Summary of HIV Incidence and Prevalence Estimates among MSM in Western Europe

Country	City	# studies	Study year	Recruitment location	Population sample	HIV Prevalence range	"Best" HIV prevalence	HIV Incidence	Reference
Belgium	National	3	2002/10	Anonymous testing sites; gay venues	MSM	1.90 – 6.06%	6.06%		[57, 86, 87]
France	National	2	2004/9	VCT sites; gay venues	MSM	2.0 – 17.70%	17.70%		[57, 60]
Italy	Rome, Verona	2	2000/9	HIV testing centre; community	MSM	11.80%	11.80%	IR 4.97/ 100 PY	[21, 31]
Netherlands	National	4	1999/2004	HIV testing centre; community	MSM, Dutch speaker	2.80 – 4.20%	4.20%	1.2 – 3.8/ 100 PY	[10 – 12, 88]

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Appendix 3.A.21 *(continued)*

Country	City	# studies	Study year	Recruitment location	Population sample	HIV Prevalence range	"Best" HIV prevalence	HIV Incidence	Reference
Portugal	Lisbon	1	2002	STI clinics	MSM	6.40%	6.40%		[57]
Spain	National	5	2003/9	Gay venues; mail to members of a LGBT association; VCT clinics	MSM	1.60 – 19.80%	5.50%		[5, 7, 21, 57, 61]
Switzerland	National	3	1996/2006	Anonymous VCT	MSM	1.60 – 3.40%	1.60%		[8, 9, 57]
United Kingdom	National	11	1999/2007	Gay venues; online; Sexual health clinics	MSM, Central and Eastern European MSM	3.10 – 13.70%	9.10%		[14, 16, 57, 65, 66, 83, 89 – 93]

Note: CI = confidence interval; IR = incidence rate; LGBT = lesbian, gay, bisexual and transgender; MSM = men who have sex with men; PY = person-year; VCT = voluntary counseling and testing.

Appendix 3.A.22
Summary of HIV Incidence and Prevalence Estimates among MSM in Central Europe

Country	City	# studies	Study year	Recruitment location	Population sample	HIV Prevalence	"Best" HIV prevalence	HIV Incidence	Reference
Albania	Tirana	2	2005/8	Community	MSM	0.80 – 1.80%	1.80%		[23, 94]
Bosnia and Herzegovina	Unclear	1	2007	Unclear	MSM	0.70%	0.70%		[33]
Bulgaria	National	1	2008	Gay venues	MSM	3.32%	3.32%		[34]
Croatia	National	3	2006	Community; gay venues	MSM, HIV-men	3.30 – 4.60%	4.5%		[35 – 37]
Czech Republic	Prague	2	2004/9	Community; gay venues	MSM	0.5 – 2.60%	2.60%		[21, 57]
Hungary	Budapest	2	2007/9	Community	MSM	2.60 – 10.40%	10.40%		[22, 38]
Macedonia (FYR)	National	1	2007	Community	MSM	0.00%	0.00%		[39]
Poland	National	1	2004	Community	MSM	4.70%	4.70%		[40]
Romania	Bucharest	1	2008/9	Gay venues	MSM	4.60%	4.60%		[21]
Serbia	Belgrade, Novi Sad, Pristina	2	2006/10	Community	MSM	0.0 – 4.25%	4.25%		[41, 42]

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Appendix 3.A.22 *(continued)*

Country	City	# studies	Study year	Recruitment location	Population sample	HIV Prevalence	"Best" HIV prevalence	HIV Incidence	Reference
Slovakia	Bratislava	1	2008/9	Gay venues	MSM	6.10%	6.10%		[21]
Slovenia	Ljubljana	2	2008/9	Gay venues	MSM	0.90 – 5.10%	5.10%		[21, 43]
Turkey	Ankara, Istanbul, Izmir	1	2006/7	Community	MSM	1.8%	1.80%		[18]

Notes: MSM - men who have sex with men.

Appendix 3.A.23
Summary of HIV Incidence and Prevalence Estimates among MSM in Eastern Europe

Country	City	# studies	Study year	Recruitment location	Population sample	HIV Prevalence	"Best" HIV prevalence	HIV Incidence	Reference
Armenia	Unclear	1	2007	Unclear	MSM	2.00%	2.00%		[44]
Azerbaijan	Baku	1	2007/8	Community	MSM	1.00%	1.00%		[45]
Belarus	National	2	2006/9	Sentinel surveillance	MSM	0.17 – 2.10%	0.17%		[95, 96]
Estonia	Tallinn	1	2008	Health and community services	MSM	2.50%	2.50%		[48]
Georgia	Tbilisi	1	2007	RDS	MSM	3.70%	3.70%		[49]
Kazakhstan	Unclear	2	2007/9	Community, sentinel surveillance	MSM	0.20 – 0.30%	0.20%		[59, 97]
Kyrgyzstan	Unclear	1	2007/8	Community	MSM	1.2%	1.20%		[59]
Lithuania	Unclear	1	2009	Unclear	MSM	2.7%	2.70%		[51]
Moldova	Chisinau	1	2007	Unclear	MSM	4.80%	4.80%		[52]
Russia	7 cities	5	2003/9	Community	MSM	0.00 – 18.00%	6.39%		[20, 22, 54, 58, 98, 99]
Ukraine	National	1	2009	Community	MSM	1.50 – 21.70%	8.60%		[55]
Uzbekistan	National	1	2009	Unclear	MSM	6.80%	6.80%		[56]

Notes: MSM - men who have sex with men; RDS = respondent driven sampling.

Appendix 3.A.24
Demographic characteristics of study respondents in Western Europe

Country	Age	Country of origin	Education	Income/ employment	HIV test previous	STI incidence/ prevalence	Violence	References
Belgium	Mean 31.3				Ever 88%; 12 m 52.2%			[87]
France	Median 38	Metropolitan France 83%, elsewhere 17%; 7.6% visible minority	Higher/ University: 64 – 65%		Ever 86.2%	Self-report 12 m 8.8 – 20.4%		[60, 84]
Israel	Mean 26 – 27	90.7% Israeli born	Higher education 53 – 65%	Above average income 54%	Ever: 64%			[17, 85]
Italy	Median 35				12 m testing and received result 53%			[21, 31]
Netherlands	Median 28 – 39, mean 36	Netherlands 87.2 – 93.2%	Low-level 9 – 21%, medium 33 – 40%, high 38 – 58%		Ever: 63.4%	Gonorrhoea 5.7 – 6/100 PY; Syphilis 1.4 – 5.4 /100 PY		[10 – 12, 88]
Norway					Ever: 74.7%; 12m and know result 56%			[100]
Spain	Median 31 – 38, mean 41	Spanish 9 – 79.7%, Latin American 11.5 – 77%, Eastern European 4 – 5%, Western European 2%, North African 2%	High school or less 47 – 52%, university 48 – 54%	Employed 61 – 69%, self-employed 12 – 14%, student 10 – 20%	Ever 63 – 86.8%, 12 m & know result 46 – 56%	12m: Syphilis 2 – 5%, Gonorrhoea 5%, chlamydia 3%, Herpes 2%, Public lice 8%, genital warts 2%	12m: 10.7 – 11% victim of aggression or verbal assaults;	[5 – 7, 21, 61, 81]
Switzerland	Mean 33	73.6 – 77% Swiss, 15.7 – 16.7 other European,						[8, 9, 82]
United Kingdom	Median 27 – 39, mean 35	White 85 – 96.7%	No qualification 12 – 19%, secondary 17 – 23%, further/ vocational 36%, university 47 – 54%	Employed 77 – 84%, student 5 – 8%, unemployed 8 – 18%	Ever: 59 – 90.1%, 12 m: 34%-50.8%	Any 12 m 36 – 45.7%, gonorrhoea 9 – 27%, chlamydia 10 – 19%, warts 8 – 9%, syphilis 1 – 7%, pubic lice 6 – 11%, herpes 3 – 4%		[14 – 16, 65, 66, 83, 91, 101 – 103]

Notes: m = months; PY = person-year.

Appendix 3.A.25
Demographic characteristics of study respondents in Central Europe

Country	Age	Country of origin	Education	Income/ employment	HIV test previous	STI incidence/ prevalence	References
Albania	44% aged <25		26.1% did not attend school			Syphilis 2.6%, HCV 3.5%	[23]
Bulgaria					12 m & know results 42%		[34]
Croatia	Median 27		57 – 61% secondary, 36 – 39% university		Ever 48 – 57%	syphilis 13.2%, gonorrhoea 13.1%, chlamydia 9%	[26, 35]
Czech Republic	Mean 28		University 27%		12 m testing and received result 42%		[21]
Hungary		Non-Hungarians excluded	Mean 28 – 2944% secondary, 40% beyond secondary; mean 15.3 years in education	72 – 88% employed: 61% “white collar”, 16% “blue collar”		All 4.3%	[22]
Macedonia (FYR)					12 m & know results 56%		[39]
Romania	Median 25				12 m testing & know result 43.2%		[21]
Serbia					12 m & know results 31%		[41]
Slovakia	Median 28				12 m & know results 32%		[21]
Slovenia	Median 30				12 m & know results 38%		[21]
Turkey	Median 26	93% Turkish	Just literate 5%, primary 11%, secondary 11%, higher 58%, still studying 14%			Prevalence HBV 3.6%, syphilis 10.8%, gonorrhoea 3%, chlamydia 1.8%	[18]

Notes: m = months;

Appendix 3.A.26
Demographic characteristics of study respondents in Eastern Europe & Central Asia

Country	Age	Country of origin	Education	Income/ employment	HIV test previous	STI incidence/ prevalence	Violence	References
Azerbaijan						HCV 14%, syphilis 8%		[45]
Estonia	Median 30	Estonian 71%, Russian 21%	<secondary 13%, secondary 18%, vocational 18%, post-secondary 51%	<=7500 EEK pa 34%, 7500 EEK+ 66%	Ever 67%			[19]
Georgia	Median 27	Georgian 83.4%, Armenian 3.6%, Russian 3.6%	57% secondary, 56% post-secondary		Ever & knows results 41%	Syphilis 31.4%; HCV 15.7%	Ever experienced violence because of sexual orientation 21%: physical 14%, verbal 12%, sexual 7%	[25]
Kazakhstan	Median 27	Kazakh 26.4%, Russian 63.6%	Elementary 7%, secondary 54%, higher 39%	Median income US$324, no income 8%, no certain occupation 4%	12 m & know the results 40%	Syphilis 4.1%, HCV 4.2%; 12m suspected: 8.3%		[59, 76]
Kyrgyzstan	Median 24	Kyrgyz 43.8%, Russian 63.6%	Elementary 5%, secondary 40%, higher 56%	Median income US$114, no income 13%, no certain occupation 18%	12 m & know the results 24 – 52%	Prevalence syphilis 10.7%, HCV 1.2%; 12m suspected: 13.7%		[59, 76]
Lithuania					12 m & know result 41%			[51]
Russia	Mean 28	Russian 62%	Middle school 34%, high school 24%; mean 15.3 years in education	72% permanently employed; 18 – 40% currently studying		10.5%; syphilis 12%, HPV 8%, HSV-2 4%, HCV 8%	Male SW sample: Ever violence from clients 28%	[20, 22]
Tajikistan		Tajik 65.9%, Uzbek 26.8%, Russian 7%			12 m & know the results 12.8%	12m suspected: 4.2%		[76]
Ukraine	Median 27		Completed secondary school or higher 92%		12 m & know the result 43%, 6 m: 35%			[24, 55]

Notes: EEK = Estonian Kroon; m = months; SW = sex worker

Appendix 3.A.27
Sexual and drug use characteristics of MSM in Western Europe

Country	UAI (c – casual partner, r – regular partner)	Condom use at last AI	Other risk (reduction) practice	Partner types & numbers	Alcohol/ drugs	Sex work	References
Belgium		c 72.1%, r 38.1%			12m alcohol 46.4%. poppers 36.3%, ecstasy 14.7%, cocaine 13.1%, Viagra 12.2%, GHB/ GBL 9.7%, cannabis 8.5%, speed 6.4%, methamphetamine 1.4%		[87]
France	c (HIV discordant or unknown) 23.5%		12 m Barebacked 30.5%, esoteric sexual practice 41.8%	12 m mean 18.1, median 6; 9.5% one, 77.9% 2 – 50, 12.6% 50+		12 m, sold sex 8.1%	[60, 84]
Israel	6m 23%		12% sex with males & females		6m: 53% none, of those who use, 47% use alcohol, marijuana 28%, poppers 27%, sildenafil-citrate 11%, MDMA 9%; 33% used 2 or more	Paid for sex 11%	[17, 85]
Italy	6 m anal sex c 45.9%, r 59.8%; oral sex c 91.9%,r 94.2%	45.6%		6 m c median 6, r 1	6m: before/ during sex: alcohol 54.2%, poppers 21.6%, ecstasy 3%, Viagra 8.6%, cannabis 13.4%, cocaine 8.3%, amphetamine 1.9%		[21, 31]
Netherlands	6 months: r 26.1%, c 15.1%, c and r 11.6%			6 m 8			[10 – 12, 88]
Norway	6m: c 24%						[100]

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Appendix 3.A. 27 *(continued)*

Country	UAI (c – casual partner, r – regular partner)	Condom use at last AI	Other risk (reduction) practice	Partner types & numbers	Alcohol/ drugs	Sex work	References
Spain	12 m: c 23 – 31%, r 55%; c <30 41%, 30+ 34%; r aged <30 69%, 30+ 60%.	33 - 57%;		6 m median 6; 12 m 10+ 64%; 12 m 9.8% female partner	12 m before/ during sex: none 36%, Alcohol 64%, Cannabis 26%, Cocaine 19%, Amphetamine 5%, Poppers 41%, Viagra 13%, Ketamine 5%, Methamphetamine 3%. # drugs used: none 44%, 1 – 3 46%, 4 – 6 8%, 7+ 2%;	12 m 4.1% charged for sex; Valencia study recruited prostitution apartments	[5 – 7, 21, 61, 81]
Switzerland	Ever 98%; c 45.7%; 12m 32.6% (HIV+ 52.4%, HIV- 31%)		24%. 73.8% used such practice intentionally. 50% practiced sorting, 33% strategic positioning, 62% withdrawal before ejaculation. 53% 1 of the 3 practices, 38%: 2, and 9% all 3.	12 m anal sex none 32.8%, 1 20.4%, 2 – 3 23.4%, 4 – 10 15.4%, 10+ 8%; 24 m 0 – 1 7.9%, 2 – 5 42.4%, 6+ 46.4%			[8, 9, 82]
United Kingdom	24 m: Any receptive: 55 – 83%, >1 partner 26 – 60%, >5 partners 6 – 27%, r 38 – 59%, c 25 – 55%; Any insertive: 61 – 76%; >1 partner 30 – 65%, >5 partners 13 – 27%; 12 m: 0 – 1 partner 86%, 2+ 14%; c 10%. UAI with partners of unknown or discordant status: 26%			12m female partner 12.2%; 12 m 10+ partners 10.7 – 11.3%, 13+ 24.8%, 30+ 16.7%	12m any 59.9% (poppers 44%, cannabis 32%, ecstasy 34%, cocaine 22%, ketamine 13%, amphetamine 9.4%, GHB 5.4%, methamphetamine 4.7%, LSD 3.5%, crack 2.1%, heroin 1%)	Paid for sex with a man 15% (London based) 9.8% (elsewhere)	[14 – 16, 65, 66, 83, 91, 101 – 103]

Notes: AI = anal intercourse; GBL = ; GHB = ; M = months; MDMA = ; UIA = unprotected anal intercourse.

Appendix 3.A.28
Sexual and drug use characteristics of MSM in Central Europe

Country	UAI (c-casual partner, r – regular partner)	Condom use at last AI	Partner types & numbers	Alcohol/drugs	Sex work	References
Albania	6 m commercial 42%; non-commercial 56%	6 m: commercial: 77%; non-commercial 60%	Female partners: ever 50%, of whom 84% in 6 m, and 71% having had 1 – 3 female partners. Male partners: 6m >50% insertive MSM have 4+ partners, 34.2% have 5+ non-commercial partners	42% daily alcohol; 65% have ever tried drugs, 59% inject, heroin most popular	6 m: 74% AI with commercial partner.	[23]
Bulgaria		c 70.4%				[34]
Croatia	12 m: 1+ c 46 – 60%	r 37 – 44%, c 58% (29% never had a c)	Female partner: ever 52 – 53%, current 7%. Male partners: 6 m med 3, 12m 0 23.4%, 1 20.5%, 2 – 3 17.5%, 4 – 7 5%, 8+ 5.6%	12m: drugs before sex 33%, alcohol before sex 51%	Ever sold sex 5%	[26, 35]
Czech Republic	6 m: c 64%, r 74%.	30%	6 m median 4	6 m: before/ during sex: Alcohol 85%, Poppers 38%, Ecstasy 11%, Viagra 13%, Cannabis 24%, Cocaine 5%, Amphetamine 9%		[21]
Hungary	3 m: 72%, r 57.6%, c 28%, with multiple 24.6%	All 49.6%, r 35.3%, c 74%	Female: ever 96.8%, 12m 96.2%. male median 4.9		12 m 5.1% paid for sex	[22]
Macedonia (FYR)		Last AI: 57%				[39]
Romania	6 m: c 48%, r 57%.	42.7%	6 m med 3	6m: before/ during sex: alcohol 62%, poppers 21%, ecstasy 8%, Viagra 5%, cannabis 12%, cocaine 6%, amphetamine 3%		[21]
Serbia		67%				[41]

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Appendix 3.A.28 *(continued)*

Country	UAI (c-casual partner, r – regular partner)	Condom use at last AI	Partner types & numbers	Alcohol/drugs	Sex work	References
Slovakia	6 m: AI casual partners 58%, regular partners 80%	31%	6 m med 3	6 m: before/ during sex: alcohol 84%, poppers 34%, ecstasy 8%, Viagra 9%, cannabis 13%, cocaine 5%, amphetamine 4%		[21]
Slovenia	6 m: AI casual partners 41%, regular partner 63%.	At last AI 43%	6 m med 3	6m: before/ during sex: Alcohol 70%, poppers 50%, ecstasy 11%, Viagra 10%, cannabis 19%, cocaine 10%, amphetamine 10%		[21]
Turkey		Ever: always 30%, almost always 7%, sometimes 12%,never 4%, do not know/ no answer 46%	Female partner: ever 36%; male partner: 0 8%, all sex in past 6m: ins, 1 8.4%, ins >1 7.2%, rec 1 6%, rec >1 10.2%, rec & ins 8.4%, rec &ins >1 28.9%		44 % sold sex, both ins and rec with >1 partner 37%, rec only 16%, ins only 16%	[18]

Notes: AI = anal intercourse; ins = insertive; MSM = men who have sex with men; m = months; rec = receptive; UAI = unprotected anal intercourse.

Appendix 3.A.29
Sexual and drug use characteristics of MSM in Eastern Europe & Central Asia

Country	UAI (c-casual partner, r – regular partner)	Condom use at last AI	Partner types & numbers	Alcohol/ drugs	Sex work	Ref.
Estonia	12 m 49%	56%		30 d: none 6%, 1 or less/ week 49%, more than 1/ week 42%, every day 4%; Illicit drug use no 57%, not regular 37%, frequent/ regular 7%		[19]
Georgia	12m all 65%, commercial partners (male & female) 72%	All 62%, male commercial partner 38%	Female partners: 12m: c 47%, Commercial: 18%. Male partners 1 – 5 69.3%, 6 – 10 15%, 11+ 15.7%	Daily alcohol 5%, any drugs 39%, Marijuana 89%, Subutex 22%; injected 24%, none with a used needle;	12 m: sold to a man 21%	[25]
Kazakhstan		All 57.1%; r 52%, c 79%, commercial partner 78%	3 m 0 1%, 1 18%, 2+ 81%; 12 m mean all 10.3, male 9.4, female 0.9	Ever injected 2.1%, mean age at first injection, 15.9, of injectors, inject daily in past 6 m 25%		[59, 76]

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Appendix 3.A. 29 *(continued)*

Country	UAI (c-casual partner, r – regular partner)	Condom use at last AI	Partner types & numbers	Alcohol/ drugs	Sex work	Ref.
Kyrgyzstan		All 47.8%; r 58%, c 54%, commercial partner 100%	3 m 0 1%, 1 17%, 2+ 82%; 12 m mean all 10.2, male 7.9, female 2.5	Ever injected 1.0%, mean age at first injection, 23.0, of injectors, inject daily in past 6m 0%		[59, 76]
Lithuania		47%				[51]
Russia	3m: any UAI 53%, r 45%, c 16%, multiple partners 16%	44.2%	12 m: 24% male and female partners	30d: 92 – 96% alcohol, (men drank alcohol on a mean 6.6 (med 5) days, and 41% had been drunk.) Poppers 21%, Marijuana/hash 15%, amphetamines 4%, injecting <1 – 8%	12 m: 16% paid for sex	[20, 22]
Tajikistan	12 m r: 97.2%, c 70.3%, commercial 96.4%	24.9%	12 m mean (median) all 74.7(26), male 69 (23), female 6.6 (1)	Ever injected 4.5%, mean age at first injection, 17.2, of injectors, inject daily in past 6m 23.1%		[76]
Ukraine		r 55%, c 82%, commercial partners 80%.	Female partners 6 m: 29% . 6 m med 4	30 d: alcohol 86%, daily alcohol 8%,1 – 2 times weekly 43%, current drug use 5%, IDU 1%	6 m: 21% paid for sex	[24, 55]

Notes: d = days; IDU = injecting drug user; m = months; MSM = men who have sex with men; Ref. = reference; UAI = unprotected Anal intercourse.

Appendix 3.A.30
Summary of multivariate studies for HIV incidence risk factors among MSM in Europe

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Van der Bij et al, 2005 [11]	The Netherlands, Amsterdam	603 HIV—men in cohort aged ≤30 until age 35 (ACS, see below)	UAI with casual partner*	Education*
Dukers et al, 2007 [12]	The Netherlands, Amsterdam	3,733 HIV—men in cohort recruited from STI clinics	STI coinfection* History of HIV testing*	Age* Nationality
	The Netherlands, Amsterdam	1,498 HIV—men in cohort recruited from community (ACS, see above)	STI coinfection*	Age* Nationality*
	The Netherlands, Rotterdam	265 HIV—men in cohort recruited from community	STI coinfection*	Age Nationality

Notes: * = ; ACS = Amsterdam Cohort Studies; UAI = unprotected anal intercourse

Appendix 3.A.31
Summary of multivariate studies for HIV prevalence risk factors among MSM in Europe

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Prasad et al, 2009 [9]	Switzerland, 5 cities	10,103 men attending anonymous HIV testing Knowledge of HIV infected partner* Condom use with occasional partner* History of STIs*	# partners in past two years*	Age* Nationality* Year of testing
Dodds et al, 2007 [66]	United Kingdom, London	1,436 men recruited at gay venues	Attended GUM in past year* STI in past year* UAI with >1 partner in past year* UAI with casual partners in past year* UAI with partners of unknown or discordant status in past year*	Employment* Education*
Dodds et al, 2007 [66]	United Kingdom, Brighton	373 men recruited at gay venues	Attended GUM in past year* STI in past year* UAI with >1 partner in past year* UAI with casual partners in past year* UAI with partners of unknown or discordant status in past year	Employment* Education *adjusted for age, education, ethnicity and employment status
Dodds et al, 2007 [66]	United Kingdom, Manchester	348 men recruited at gay venues	Attended GUM in past year* STI in past year UAI with >1 partner in past year UAI with casual partners in past year UAI with partners of unknown or discordant status in past year	Employment Education
Macdonald et al, 2008 [15]	United Kingdom, London, Brighton, Manchester	232, 75 cases, 157 controls recruited from sexual health clinics	Ancillary sexual behaviours* STIs* Substance use*	Venues used to meet men*

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Appendix 3.A.31 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Williamson et al , 2007 [65]	United Kingdom, Glasgow, Edinburgh	1,350 men recruited in gay venues	# sex partners in past year # anal sex partners in past year* UAI with >1 sex partner in past year STI in past year*	Age* Recruitment location Survey venue Area of residence

Notes: * = adjusted for age, education, ethnicity and employment status; GUM = Genito Urinary Medicine Clinic; UAI = unprotected anal intercourse.

Appendix 3.A.32
Summary of multivariate studies for STI incidence risk factors among MSM in Europe

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Van der Bij et al, 2005 [11]	The Netherlands, Amsterdam	603 HIV- men in cohort aged ≤30 until age 35 (ACS)	Sells sex*	Calendar time*

Note: ACS = Amsterdam Cohort Studies.

Appendix 3.A.33
Summary of multivariate studies for unprotected anal intercourse (UAI) risk factors among MSM in Europe

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Folch et al, 2006 [81]	Spain, Barcelona	354 men reporting steady male partners, recruited at gay venues	UAI with steady male partners: • HIV status of couple • Attitudes about HIV prevention given availability of ART	Living arrangements
		543 men reporting casual male partners, recruited at gay venues	UAI with casual male partners: • HIV status (self-report) • Drug use before/ during sex • Index reflecting acceptance of gay men's orientation • Attitudes about HIV prevention given availability of ART	Victim of aggression or verbal assaults Recruitment site Circle of friends

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Appendix 3.A.33 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Folch et al, 2009 [6]	Spain, Catalonia	850 men recruited at gay venues	UAI with casual male partners: • # male sex partners • # drugs used • HIV status (self-report)	Country of origin Internalised homophobia Met casual partners online
Balthasar et al, 2010 [82]	Switzerland, National	1,689 men recruited online and through gay media	No or inconsistent condom use in past year: • # partners in past year • Stable relationship in past year • HIV status (self-report) • Visited risk reduction HIV prevention site • HIV status x # partners (interaction)	Age Internet partner seeking
Štulhofer et al, 2008 [26]	Croatia, Zagreb	216 men recruited through snowball techniques	Condom use at last AI with casual partner: • HIV knowledge • HIV risk self-assessment • # partners in past 5 years • Ever tested for HIV • Sex with a woman • Sold sex • In a stable relationship • Used drugs before sex • Used alcohol before sex	Age Frequency of cruising Education Internet partner seeking
Amirkhanian et al, 2009 [22]	Russia, St Petersburg and Budapest, Hungary	38 men in St Petersburg and 118 men in Hungary recruited through RDS	Any UAI • Safer sex intentions • Condom and safer sex attitudes	
			UAI with casual partner • Safer sex intentions • Safer sex self efficacy	Education
			UAI with multiple partners • Safer sex intentions • Safer sex self efficacy	

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Appendix 3.A.33 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Mor et al, 2008 [17]	Israel, national	2,873 men recruited through gay orientated websites	UAI and substance use: • Casual contacts in past 6 months • Sells sex • Steady and casual partners • Dislikes condoms • Negotiation skills • HIV knowledge • Age at first sexual intercourse • Number of sexual encounters	Lives in Tel Aviv Education Living situation model adjusted for age
Mor et al, 2011 [85]	Israel, national Outcome "sex risk behaviour" defined as performing insertive or receptive UAI during the past 6 months with at least one of the following cases: (1) not knowing his own HIV status; (2) not knowing his steady partner's HIV-status; (3) UAI with an HIV-positive steady partner; (4) UAI with a casual partner; (5) participant who performed UAI with their HIV-negative steady partner, while concurrently having UAI with the casual partner.	896 men recruited through gay-orientated websites reporting sex with casual partners	Sex risk behaviour among MSM with casual partners: • # partners • Receptive oral with ejaculation • Substance use before/ during sex • Insufficient negotiation skills • Negative attitude to condoms • Risk-taker personality	Education Meeting sexual partners in venues that encourage sexual activity
		907 men recruited through gay-orientated websites reporting sex with steady partners	Sex risk behaviour among MSM with steady partners: • # partners • Insufficient negotiation skills • Negative attitude to condoms • Risk-taker personality • Length of relationships	Being at high risk of HIV model adjusted for age
Kasianczuk et al, 2009 [24]	Ukraine, 10 cities	1,764 men recruited through snowball methods	Condom use at last AI: • Insertive/ receptive role in past 6 months • Partners type in past 6 months • Alcohol/ drugs • Knows where to test for HIV • Ever had an HIV test • Perceived risk of HIV	Age

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Appendix 3.A.33 *(continued)*

Study, year	Location	Sample	Individual-level risk factors	Environmental-level risk factors
Léobon et al, 2011 [84]	France, national	11,768 HIV—men recruited through gay-orientated general interest and specialised websites	12 m regular unprotected sex with casual partners: • Sensation seeking • # casual partners • Barebacked with a couple • Oral contact with sperm • Esoteric activity • Traded sex • Used drugs • Used alcohol • Had an STI	Recruitment website Education Live in Paris Venues used to find sexual partners
		2,130 HIV- men recruited through gay-orientated general interest and specialised websites	12 m regular unprotected sex with casual partners: • Sensation seeking • # casual partners • Sex with a casual while couples • Barebacked with a couple • Oral contact with sperm • Esoteric activity • Traded sex • Used drugs • Used alcohol • Had an STI	Recruitment website Age Education Live in Paris Venues used to find sexual partners
Evans et al, 2011[83]	United Kingdom, national	691 Central and Eastern European migrant men recruited through gay-orientated websites	UAI with casual partners in past year: • Self-report HIV status • Ever injected drugs • Recreational drug use in past year • Been paid for sex in United Kingdom	Age Employment Education Country of origin Completed questionnaire in native language Time in United Kingdom Lives in London Recruitment website

Note: Notes: AI = anal intercourse; ACS = Amsterdam Cohort Studies; m = months; UAI = unprotected anal intercourse.