



OPEN ACCESS

Analysis of duration of risk behaviour for key populations: a literature review

Erika Fazito,¹ Paloma Cuchi,² Mary Mahy,² Tim Brown³

► Additional supplementary tables are published online only. To view these files please visit the journal online (<http://dx.doi.org/10.1136/sextrans-2012-050647>).

¹University of Brasília, Brasília, Brazil

²Department of Epidemic Analysis and Monitoring, UNAIDS, Geneva, Switzerland

³Research Program, East-West Center, Honolulu, Hawaii, USA

Correspondence to

Erika Fazito, University of Brasília, 26 Chemin Colladon, 1209 Genève, Suisse, Brasília, Brazil; erikafazito@gmail.com

UNAIDS Report 2012

Guest Editors

Karen Stanecki
Peter D Ghys
Geoff P Garnett
Catherine Mercer

Accepted 27 August 2012

ABSTRACT

Background The objective of this paper is to review literature in order to calculate regional estimates of the average duration of time individuals maintain a specific high-risk behaviour.

Methods The review targeted the key populations of female sex workers (FSW), male clients of female sex workers (MCFSW), people who inject drugs (injecting drug users (IDU)) and high-risk men who have sex with men (MSM). To be included in the review the study had to provide information on (1) the time a person spent at risk until death or cessation of the risk behaviour, (2) the percentage of the sample who initiated the risk behaviour in less than a year or (3) the mean or median duration of the behaviour from a representative sample.

Results 49 papers were found for the FSW population describing the period of time FSW stay in sex work to be between 2.9 years (Asia) and 12 years (Latin America). Eight papers were found for MCFSW showing the duration of the risk behaviour in this category varying from 4.6 years in Africa to 32 years in Asia. 86 papers were reviewed for the population of IDU showing that the average time a person injects illegal drugs varies from 5.6 years (Africa) to 21 years (South America). No information was found for duration of high-risk behaviour among MSM; instead, the definitions found in the literature for high- and low-risk behaviour among MSM were described.

Conclusions There is high variability of estimates of duration of high-risk behaviours at regional level. More research is needed to inform models and prevention programmes on the average duration of time individuals maintain a specific high-risk behaviour.

INTRODUCTION

Public health policies must be based on estimates that can support informed decision making and guide HIV prevention resource allocation. The extremely dynamic nature of the HIV epidemic and the various forms it takes in different countries challenge public health managers to find ways to accurately monitor and evaluate its trends. Mathematical modelling plays a central role in this process. It contributes to the understanding of the dynamics of HIV spread, provides the information needed to guide responses, helps to identify gaps in existing knowledge and suggests directions for future research.¹

The Joint United Nations Programme on HIV/AIDS (UNAIDS) develops models (Spectrum² and Estimation and Projection Package (EPP)³) to analyse HIV epidemics and their impacts for incountry application. These models allow countries to estimate HIV incidence, HIV prevalence, numbers of people living with HIV, numbers of AIDS related

deaths, numbers of people in need of antiretroviral therapy (ART), numbers of HIV-positive pregnant women in need of ART prophylaxis and numbers of children orphaned by HIV, along with other programmatically relevant outputs.

In concentrated epidemics, HIV tends to be focused in a small number of groups with elevated behavioural risk of HIV and their immediate sexual partners. Thus, models of such epidemics must be largely based on information about those key populations: injecting drug users (IDU), high-risk men who have sex with men (MSM), female sex workers (FSW) and their clients (male clients of female sex workers (MCFSW)). However, these populations are often not static. Each year some individuals initiate the behaviours that place them in a behavioural risk group, while others terminate these behaviours, leaving the group; that is, the groups have turnover. Such turnover has significant impacts on the prevalence and incidence in the at-risk population and also in the typically lower-risk populations to which they return.

Because those entering an elevated risk population are typically coming from a lower-risk, lower prevalence group, they tend to dilute the current prevalence in the at-risk population. Similarly, those leaving the group are often a higher prevalence than the group as a whole because many of them have longer histories of exposure to risk. Both of these effects mean that in order to maintain a fixed prevalence level in an at-risk population, the incidence in the at-risk population must be higher than it would be otherwise. If models are to correctly estimate the incidence in the group for a given pattern of prevalence, then they need to account for these effects. When turnover effects are included, the prevalence curve over time is generally found to flatten out relative to what it would be with no turnover (see figure 1). This is because most HIV mortality that would normally bring down the prevalence in a closed population occurs outside of the at-risk population if the turnover is high, leading to a flatter curve.

In addition, if the prevalence in the group is high, substantial numbers of those leaving the group and returning to a lower-risk population are HIV-positive. This drives prevalence up in the receiving population without incurring additional incidence. In some cases, 10%–20% of the overall prevalence in the receiving population may result from risk behaviours which occurred outside of that population.

It is essential in concentrated epidemics that models take this into account. Recognising the importance of turnover, the UNAIDS EPP allows users to specify turnover in specific populations.

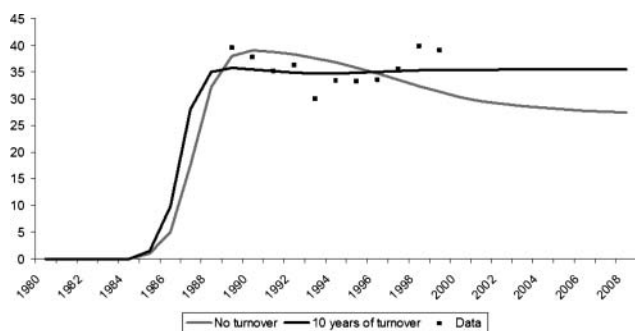


Figure 1 HIV prevalence (%) in the injecting drug users (IDU) population by year and turnover input, Thailand.

This is done by specifying three things: (1) that turnover does occur in this population; (2) the average time, that is, duration that individuals remain in the at-risk population; and (3) the lower-risk population to which they will return.

This creates additional data needs for concentrated epidemics where turnover is high and is affecting epidemic dynamics. In addition to data on the size of key populations, data are also required on the average time that people remain in the group. That is, one needs to know how many years a person injects drugs, how many years women stay employed in sex work, how many years MSM engage in unprotected, high-risk anal sex and how many years an MCFSW remains a client. The expectation is that, on average, at the end of that time period a person returns to a lower-risk population group, stopping the behaviours that put the person at a higher risk of contracting HIV.

In 2009 and 2010, the estimated average duration was based on experts' opinion because currently countries have very little data on such movements of people in and out of the populations. But given the great impact that this can have on incidence and prevalence, it is critical that the durations used in such models be based on scientific evidence. The objective of this paper is to conduct a review of the literature to generate regional estimates of the average duration that individuals maintain a specific high-risk behaviour before returning to a lower-risk population.

METHODS

The study is a literature review that aimed to compile the limited available data on duration of high-risk behaviour among key populations.

The review was performed using PubMed in October 2010. To identify additional pertinent publications, the references listed in the papers found in the search were hand-searched and researchers were contacted to obtain non-published information. Grey literature was also reviewed.

The studies had to meet the following criteria to be included in the review: (1) to be an original work instead of a literature review; (2) to be studies of one of the key populations important in concentrated epidemics (high-risk MSM, IDU, FSW and MCFSW); and (3) to include information on the duration of risk behaviour or information that could be converted into estimates of duration. Papers in English, Spanish, French and Portuguese were searched with no limits on date. The following search criteria were used:

- ▶ FSW: (((((((sex workers[Title]) OR sex worker[Title]) OR commercial sex worker[Title]) OR commercial sex workers[Title]) OR sex-trafficked women[Title]) OR

prostitutes[Title]) OR prostitution[Title]) OR duration sex work[Title]) OR sex work[Title]

- ▶ IDU: idu[All Fields] OR (inject[All Fields] AND "drugs"[All Fields]) AND users[All Fields] OR (inject[All Fields] AND "drugs"[All Fields] AND user[All Fields])
- ▶ MSM: high [title] AND risk [title] AND "men who have sex with men" [title]
- ▶ CFSW: ("clients"[Title/Abstract] AND prostitutes[Title/Abstract]) OR ("clients"[Title/Abstract] AND ("female"[Title/Abstract] AND "sex"[Title/Abstract] AND workers"[Title/Abstract])

Information on the study design, year of data collection, location, turnover, sample definition, age and gender was collected and summarised in tables that can be accessed online as supplementary tables for this paper (see online supplementary tables S1, S2 and S3).

The ideal studies to assess duration of high-risk behaviour would be surveys of former members of these key populations. The question asked would be how long they had engaged in the high-risk behaviour. In the literature review, for all groups except for IDU, no papers on former members of these key populations were found. Hence, instead of searching for data from which to actually estimate average duration of behaviour, it was necessary to search for data from surveys of current key populations that included information indicating how long the respondent had been at risk. This information was given in three different ways, depending on the study. Some authors calculated the mean or median time the respondents had been at risk, some demonstrated the percentage of the sample who started the risk behaviour in the last year and a few described the duration of the behaviour as the amount of time a person spent in the risk behaviour group until death or cessation.

Because of the diverse presentation of results, it was necessary to create an algorithm to decide how to use the results and choose the best estimate for each region. The first method of choice was direct estimation of duration (the time a person spent at risk until death or cessation of risk behaviour). This required that the person had already discontinued the behaviour that put them in that group.

If the first method was not available, the second method of choice would be used. This consisted of estimating the duration of risk behaviour by the percentage of the sample who initiated the risk behaviour in less than a year. If the population is not changing size, that is, is in a steady state, this percentage will equal the percentage who stopped the behaviour in the last year. In a steady state the entries must equal exits and thus the duration will be $1/(\text{the proportion})$, so if 10% entered, then the average duration will be $1/0.1 = 10$ years.

If data to apply the first two methods were not available, a third method was used to estimate turnover. The third method consisted of doubling the median or mean time the people remained in the risk behaviour group in the moment of the study interview. This assumes that the duration of time in the key population is randomly distributed and has a normal distribution. It is recognised that this assumption may often be violated as the distribution of time in a group is often heavily skewed toward lower durations, with many people entering the groups for a short period and then ceasing the corresponding risk behaviours. Because of that assumption we used primarily the median and in its absence the mean to calculate duration. The results for the third method are presented in a range formed by the mean and the median of the duration of the datasets.

If data were available, all three methods were applied for all the regions and key populations. The duration of high-risk

behaviour has been derived for the following geographic regions: America, Europe, Asia, Australia/Oceania and Africa. When possible, the basic regions were unfolded to depict more specific information.

RESULTS

Female sex workers

In all, 31 papers were found for Africa and they generated information about 47 different datasets.

- ▶ Four papers described the percentage of FSW who started selling sex in the last year.^{4–7} Based on these studies the mean duration for FSW is estimated to be 5.5 years.
- ▶ Using the third method proposed, 43 datasets provided the average duration of sex work.^{8–29} This period ranged from 0.3 to 6.0 years, with a mean and a median of 2.9 years which resulted in an average duration of 5.5 years.

A total of 40 papers were found on Asia which generated information from 48 different datasets.

- ▶ Twelve papers described the percentage of FSW who started selling sex in the last year. Based on that information, the mean duration for FSW was 2.94 years and ranged from 1.35 to 12.05 years according to the dataset.^{30–40}
- ▶ Thirty-one datasets showed the average duration spent in sex work. This period ranged from zero to 6.5 years, with a mean of 2 years and a median of 1.4 years which would lead to a duration between 2.8 and 4.0 years.^{37 41–63}

Nine papers were found on Europe and they generated information on 10 different datasets, showing the average duration of sex work. This period ranged from 1.5 to 12 years, with a mean of 5 years and a median of 4.2 years, which would lead to a duration between 8.4 and 10 years.^{64–72}

Six papers were found for Latin America, describing the average time FSW spend in business. This period varied from 3.5 to 8.8 years according to the dataset, with a mean of 6 years and a median of 5.6 years, which would lead to a duration of risk behaviour between 11.2 and 12 years.^{73–79}

Three papers were found in North America, showing the duration of sex work up to the interview in median years. The median ranged from 5 to 6.4 years with a mean of 5.5 years and a median of 5.1 years. If we consider this distribution to be normal and double the values to reach turnover, the estimated duration of risk behaviour is between 10.2 and 11 years.^{80–82}

No papers were found for Oceania/Australia.

In summary, it was possible to generate estimates for duration of risk behaviour for five regions. The results are presented in table 1.

Male clients of female sex workers

Eight papers were found describing the median or mean duration during which men routinely bought sex: three in America^{83–85} (two in Mexico and one in Haiti), three for Asia/Oceania^{86–88} (China, India and Australia) and two for Africa^{89 90} (Benin and Kenya).

In America this period ranged from 6.3 to 10.8 years, with a mean of 8 years which leads to an estimated duration of risk behaviour of 16 years. For Asia/Oceania, the estimated duration ranged from 9.0 to 30 years, with a mean of 16.2 years which leads to a duration of 32.4 years.

One paper from Africa described the percentage of men who started paying for sex in the year prior to the survey (21.9%) suggesting a duration of 4.6 years.

Estimates on duration of risk behaviour are presented in table 2. However, given the low number of studies and wide variability, these findings must be interpreted with caution.

Table 1 Regional estimates of duration of risk behaviour for FSW by the method of calculation

Region	Duration of risk behaviour for female sex workers		
	First method of calculation: based on time from beginning of sex work until death or cessation	Second method of calculation: based on percentage of FSW who started selling sex in the last year	Third method of calculation: based on the median/mean time spent in sex work up to the moment of the study*
Africa	NA	5.5 (4)†	5.5 (43)
Asia	NA	2.9 (12)†	2.8–4.0 (31)
Australia/Oceania	NA	NA	NA
North America (studies conducted in the USA)	NA	NA	10.2–11.0 (3)†
Europe	NA	NA	8.4–10.0 (10)†
Latin America (studies conducted in Mexico, Brazil and Peru)	NA	NA	11.2–12.0 (6)†

(1) In parenthesis, number of datasets used for calculation.

*Considering the median equals mean (primarily the median and, in its absence, the mean).

†Best estimate for the population.

NA, not available.

More country-specific data are urgently needed for this population.

Injecting drugs users

In most of the world, more duration information was available for IDU compared with other key populations; however, there was substantial geographic variation in the number of studies conducted. Only two papers were found on IDU in Africa^{91 92} and one provided the percentage of IDU who started injecting drugs in the year prior to the survey: 18%.⁹³ Based on that information, the turnover for IDU was estimated to be 5.6 years.

Table 2 Regional estimates of duration of risk behaviour for MCFSW by the method of calculation

Region	Duration of risk behaviour for MCFSW		
	First method of calculation: based on time from beginning of risk behaviour until death or cessation	Second method of calculation: based on percentage of MCFSW who started paying for sex in the last year	Third method of calculation: based on the median/mean time clients spent paying for sex up to the moment of the study*
Africa	NA	4.6 (1)†	5.5 (2)
Asia/Oceania	NA	NA	32.4 (3)†
Europe	NA	NA	NA
America	NA	NA	16.2 (3)†

(1) In parenthesis, number of datasets used for calculation.

*Considering the median equals mean (primarily the median and, in its absence, the mean).

†Best estimate for the population.

NA, not available.

Overall, 16 papers were found on IDU in Asia and they generated information on 23 different datasets.

- ▶ Six datasets described the percentage of IDU who started injecting drugs in the year prior to the survey.^{92–94} Based on that information, the mean turnover for IDU was estimated to be 8.7 years with a range from 3.7 to 22.2 years.
- ▶ In all, 17 datasets showed the average time a person spent injecting drugs.^{95–107} This period ranged from 1.9 to 17.0 years, with a mean of 6.8 years and a median of 4.4 years suggesting turnover between 8.8 and 13.6 years.

A total of 12 papers were found in Oceania, all conducted in Australia, generating 15 different datasets.

- ▶ A study conducted in Australia¹⁰⁸ aimed to examine mortality within the 626 IDU from the Victorian Injecting Drug Users Cohort Study (VICS). They retrospectively examined mortality comparing data from the VICS, recruited from 1990 to 1995, to data from the National Death Index containing records of all deaths in Australia from 1990 to 2006. A total of 26 IDU died before the end of 2006 and the average length of injecting career at death was 17.0 years (SD=7.05, min 3.86, max 29.79); 18 of the 26 deaths were drug-related.
- ▶ One paper¹⁰⁹ described the percentage of IDU who started injecting drugs in the last year. Based on that information, the turnover for IDU was estimated to be 5.2.
- ▶ Thirteen datasets showed the average time a person spent injecting drugs.^{110–119} This period ranged from 2.4 to 15 years, with a mean of 9.1 years and a median of 8 years suggesting a turnover between 16 and 18.2 years.

A total of 24 papers were found in Europe generating 37 different databases.

- ▶ A study conducted in Scotland aimed to identify the mortality risk and explore the causes of death in all IDU who attended a family medical practice in northwest Edinburgh.¹²⁰ They were followed for 21 years, and the mean time from first injection until death was 13.9 years.
- ▶ Four datasets described the percentage of IDU who started injecting drugs in the year prior to the survey.^{121–123} Based on that information, the mean turnover for IDU was estimated to be 8.9 years.
- ▶ Thirty-two datasets^{124–142} described the mean duration of injecting career up to the moment of the interview. It varied from 1.3 to 14.3 years, leading to a mean and a median of 8.6 years. If we consider this distribution to be normal and double the value to reach turnover, the estimated turnover would be 17.2 years.

Six papers were found on South America generating nine different datasets and they all described the duration of injecting career up to the moment of the interview by medians and means. This period ranged from 2.2 to 21 years, with a mean of 10.5 years and a median of 9.8 years suggesting turnover between 21 and 19.6 years.^{143–148}

A total of 26 papers were found in North America generating 34 different datasets.

- ▶ A prospective study conducted in the USA aimed to examine both the incidence of injection cessation and the change in injection frequency among those who did not quit injection.¹⁴⁹ The study included 901 IDUs who were recruited from a Needle Exchange Program (NEP) or an area with no NEP in Chicago between 1997 and 2002. Cessation of injection, the main outcome variable, was defined as no injection drug use since the last interview (1 year prior). In all, 116 IDUs ceased injection during the

Table 3 Regional estimates of duration of risk behaviour for IDU by the method of calculation

Region	Duration of risk behaviour		
	First method of calculation: based on time from beginning of drug injection until cessation	Second method of calculation: based on percentage of IDU who started drug injection in the last year	Third method of calculation: based on the median/mean time spent in drug injection up to the moment of the study*
Africa	NA	5.6 (1)	5.6 (1)
Asia	NA	8.7 (6)	8.8–13.6 (17)
Oceania	17.0 (1)†	5.2 (1)	16.0–18.2 (13)
North America	9.5 (1)†	4.7 (5)	8.8–14.0 (33)
Europe	13.9 (1)†	8.9 (4)	17.2 (32)
South America	NA	NA	19.6–21.0 (9)

The number of datasets used for each calculation are given in parenthesis.

*Considering the median equals mean (primarily the median and in its absence the mean).

†Best estimate for the population.

NA, not available.

study, and the median number of years from first injection until cessation was 9.5 years.

- ▶ Five datasets described the percentage of IDU who started injecting drugs in the last year.^{150–153} Based on that information, the mean duration for IDU was 4.7 years.
- ▶ 33 datasets showed the average time a person spent injecting drugs.^{133 152–173} This period ranged from 1.3 to 23.9 years, with a median of 4.4 years and mean of 7 years, suggesting a duration between 8.8 and 14 years.

Duration estimates were generated for six regions. The results are presented in table 3.

High-risk MSM

MSM are also a key population because of the increased risk of HIV transmission through anal intercourse. However, anal intercourse can be safe when between faithful, uninfected partners or when consistent condom use is practiced. A literature review was completed of surveys of MSM looking for the turnover between high-risk MSM and low-risk MSM. However, no studies assessing turnover for this population were found. At this point it is not possible to estimate average duration in the high-risk MSM population. We decided then to compile the different definitions used in surveys for high- and low-risk MSM to contribute to the characterisation of these two different patterns of sexual behaviour among the MSM population. The MSM sexual practices are described below according to the risk of exposure to HIV.^{174–181}

High-risk sexual behaviours

- ▶ Barebacking
- ▶ Unprotected anal intercourse (UAI) with an HIV-seropositive partner
- ▶ Rimming (anal/oral sex play)
- ▶ Fisting (insertion of the hand into the anus)
- ▶ Use of sex toys and shared drug implements
- ▶ UAI with casual partners
- ▶ UAI with partners of an unknown or discordant HIV status
- ▶ Having multiple sex partners

- ▶ Trading sex
- ▶ Having unprotected anal sex and anal sex while drunk or high in the past 6 months

Low-risk sexual behaviours

- ▶ Men who had been involved in a mutually monogamous relationship for 2 or more years with a male partner known to be negative for HIV antibodies.
- ▶ Men who had been involved in a mutually monogamous relationship for 2 or more years with a male partner under ART treatment.

Very few studies cover duration of risk behaviours for male sex workers and transvestites and therefore were not included in the study.

DISCUSSION

This literature review provides estimates of the average duration people spend in high-risk behaviours categories by mode of exposure and geographical region. As described earlier, mathematical models of the HIV epidemic can use this information to estimate changes in the epidemic due to new susceptibles entering (ie, the population newly joining the high-risk populations) and older, higher prevalence members leaving. Spectrum/EPP, a model used by over 150 countries, requires this as an input for countries with concentrated HIV epidemics if the user wishes to apply turnover in their fits. This paper provides a more scientific basis for making turnover estimates using published and unpublished data that can be used by countries as inputs for the Spectrum/EPP model.

The results of the review showed that average duration of female sex work varies dramatically by region with the shortest durations (and highest turnover) found in Asia and the longest average duration of sex work found in the Americas.

Similarly, the average duration of injecting drug use varies by region. In Africa, average duration of injecting drug use was approximately 6 years while in South America and Oceania the duration was closer to 20 years. Large differences in turnover have important implications for prevention activities and services for key populations. In areas with very high turnover more frequent outreach activities and surveillance activities are required. Where turnover is slower, activities can focus more on reaching divergent subgroups of the key populations to ensure the entire population is reached with services.

The variability of these estimates at regional level suggests that there are substantial differences at national levels as well. Differences in duration might be due to different public health interventions by region, country or subnational level or due to different reasons for the high-risk behaviour such as financial need for sex work or poor future prospects for injecting drug use. Also, duration of injecting drug use is highly dependent on mortality, thus the differences in average injecting drug duration could be associated with differences in healthcare for the injecting drug population.

This study has several limitations. First, the definitions of key populations present minor variations among the different surveys analysed. Also, it is important to highlight that for the calculation of duration of risk behaviour for FSW, some studies that included FSW who practice injecting drug use were included. Similarly, studies on IDU who practice commercial sex work were included in the calculations of the average duration of time of injecting drugs. It was decided not to separate such information because the estimates of duration of risk behaviour calculated in this study are intended to serve

as input for mathematical HIV/AIDS models. In such models, the stratification of an epidemic structure, in terms of populations, can be made as far as strategic information is available for each population. And rarely do countries have detailed information about HIV prevalence and population size for, for example, the sex workers who use injected drugs and the ones who do not.

Another point to be addressed is the differences found between the estimates generated by methods 2 and 3. These methods generated most of the time similar estimates of duration of risk behaviour, except for the population of IDU in Asia, Oceania and North America. In these regions, the estimates of duration calculated by method 2 are lower than the ones calculated by methods 1 and 3. One possible explanation is that the assumption of stability is being violated. In this case, method 2 may be underestimating duration. Given the limited number of studies allowing method 2 to be used, another likely explanation is that the specific populations of IDU being examined in the different papers have widely varying durations. In those few cases where data were available to apply both methods 2 and 3 the variation was not as extreme as the table averages would imply. And as (1) populations of IDU and FSW are likely to fluctuate due to economic changes, legal changes, changes in demand and changes in supply for the behaviour and (2) many samples are censored, the estimates of duration calculated by methods 2 and 3 among FSW and IDU should be compared which determine whether violations of the assumption of a steady state have a significant impact on the estimates.

Another limitation is that the estimates for MCFSW must be interpreted cautiously due to two reasons. First, to the low number of studies found. And second, because in many countries, young men may go through a period during which they frequent sex workers often, but then this behaviour ceases or slows once they marry. In countries where this is the most common male behavioural pattern, a better estimator of duration of high-risk behaviour for this population may be the difference between average age at first intercourse and average age at marriage.

Last, it is important to highlight that very few surveys collect data on duration of high-risk behaviour and thus the analysis was limited to the countries that have been collecting these data. Therefore, the geographical coverage in this review is limited to a few countries that have collected information on duration or time since initiation of risk behaviour.

Despite the many limitations to the calculations presented in this paper, these are, to the authors' knowledge, the best available estimates of durations of risk behaviours. One important implication of this review is the need to include questions from which to estimate duration of risk behaviour in surveys among members of key populations in concentrated epidemics. These questions should be, for example: How long have you been exchanging sex for money? How long have you been injecting illegal drugs? How long have you been buying sex from FSW? From these questions, it is possible to demonstrate the proportion of members who have had the behaviour for less than 12 months and easily calculate duration of risk behaviour.

More research on turnover among key populations is needed to inform both models and prevention programmes. Future reviews on this subject should attempt to identify surveys in other databases such as Embase and Medline, rather than PubMed, and should also search for additional grey literature.

Key messages

- This paper provides a more scientific basis for making turnover estimates using data that can be used by countries as inputs for the Spectrum/Estimation and Projection Package model.
- There is high variability of estimates of duration of high-risk behaviours at regional level.
- More research is needed to inform models and prevention programmes on the average duration of time individuals maintain a specific high-risk behaviour.

Contributions EF: Conception and design of the study, acquisition of data, analysis and interpretation of data, article draft, paper review for important intellectual content, final approval of the version to be published. PC and MM: Conception and design of the study, analysis and interpretation of data, paper review for important intellectual content, final approval of the version to be published. TB: Interpretation of data, paper review for important intellectual content, final approval of the version to be published.

Competing interests None.

Provenance and peer review Commissioned; externally peer reviewed.

REFERENCES

1. Clark SJ, Morris M. Mathematical models for HIV transmission dynamics: tools for social and behavioral science research. *J Acquir Immune Defic Syndr* 2008;**47** (Suppl 1):S34–9.
2. Stover J, Johnson P, Hallett T, et al. The Spectrum projection package: improvements in estimating incidence by age and sex, mother-to-child transmission, HIV progression in children and double orphans. *Sex Transm Infect* 2010;**86**(Suppl 2):ii16–21.
3. Brown T, Bao L, Raftery AE, et al. Modeling HIV epidemics in the antiretroviral era: the UNAIDS estimation and projection package 2009. *Sex Transm Infect* 2010;**86**(Suppl 2):ii3–10.
4. Delaporte E, Buvé A, Nzila N, et al. HTLV-I infection among prostitutes and pregnant women in Kinshasa, Zaire: how important is high-risk sexual behavior? *J Acquir Immune Defic Syndr Hum Retroviral* 1995;**8**:511–15. PubMed PMID: 7697449.
5. Nagot N, Ouangré A, Ouedraogo A, et al. Spectrum of commercial sex activity in burkina faso: classification model and risk of exposure to HIV. *J Acquir Immune Defic Syndr* 2002;**29**:517–21.
6. Kayembe PK, Mapatano MA, Busangu AF, et al. Determinants of consistent condom use among female commercial sex workers in the Democratic Republic of Congo: implications for interventions. *Sex Transm Infect* 2008;**84**:202–6. Epub 2007 Nov 30.
7. Pepin J, Dunn D, Gaye I, et al. HIV-2 infection among prostitutes working in The Gambia: association with serological evidence of genital ulcer diseases and with generalized lymphadenopathy. *AIDS* 1991;**5**:69–75.
8. Dada AJ, Ajayi AO, Diamondstone L, et al. A Serosurvey of Haemophilus ducreyi, Syphilis, and Herpes Simplex Virus Type 2 and their association with human immunodeficiency virus among female sex workers in Lagos, Nigeria. *Sex Transm Dis* 1998;**25**:237–42.
9. Fowke KR, Nagelkerke NJ, Kimani J, et al. Resistance to HIV-1 infection among persistently seronegative prostitutes in Nairobi, Kenya. *Lancet* 1996;**348**:1347–51. PubMed PMID: 8918278.
10. Jennes W, Sawadogo S, Koblavi-Dème S, et al. Cellular human immunodeficiency virus (HIV)-protective factors: a comparison of HIV-exposed seronegative female sex workers and female blood donors in Abidjan, Côte d'Ivoire. *J Infect Dis* 2003;**187**:206–14. Epub 2002 Dec 30. PubMed PMID: 12552445.
11. Lavreys L, Chohan V, Overbaugh J, et al. Hormonal contraception and risk of cervical infections among HIV-1-seropositive Kenyan women. *AIDS* 2004;**18**:2179–84. PubMed PMID: 15577651373.
12. Kaul R, Kimani J, Nagelkerke NJ, et al. Risk factors for genital ulcerations in Kenyan sex workers. The role of human immunodeficiency virus type 1 infection. *Sex Transm Dis* 1997;**24**:387–92. PubMed PMID: 9263358.
13. Jennes W, Vuylsteke B, Borget MY, et al. HIV-specific T helper responses and frequency of exposure among HIV-exposed seronegative female sex workers in Abidjan, Cote d'Ivoire. *J Infect Dis* 2004;**189**:602–10. Epub 2004 Jan 29. PubMed PMID: 14767812.
14. Ghys PD, Diallo MO, Ettiègne-Traoré V, et al. Increase in condom use and decline in HIV and sexually transmitted diseases among female sex workers in Abidjan, Côte d'Ivoire, 1991–1998. *AIDS* 2002;**16**:251–8. PubMed PMID: 11807310.
15. Asamoah-Adu C, Khonde N, Avorkiah M, et al. HIV infection among sex workers in Accra: need to target new recruits entering the trade. *J Acquir Immune Defic Syndr* 2001;**28**:358–66. PubMed PMID: 11707673.
16. Mulanga-Kabeya C, Morel E, Patrel D, et al. Prevalence and risk assessment for sexually transmitted infections in pregnant women and female sex workers in Mali: is syndromic approach suitable for screening? *Sex Transm Inf* 1999;**75**:358–60.
17. Cameron DW, Ngugi EN, Ronald AR, et al. Condom use prevents genital ulcers in women working as prostitutes: influence of human immunodeficiency virus infection. *Sex Transm Dis* 1991;**18**:188–91.
18. Ramjee G, Williams B, Gouws E, et al. The impact of incident and prevalent herpes simplex virus-2 infection on the incidence of HIV-1 infection among commercial sex workers in South Africa. *J Acquir Immune Defic Syndr* 2005;**39**:333–9. PubMed PMID: 15980695.
19. Phillipon M, Saada M, Ali Kamil M, et al. Fréquentation de un centre de santé par les prostituées clandestines à Djibouti. *Cahiers Santé* 1997;**7**: 5:10.
20. Nzila N, Laga M, Thiam MA, et al. HIV and other sexually transmitted diseases among female prostitutes in Kinshasa. *AIDS* 1991;**5**:715–21.
21. Kanki P, M'Boup S, Marlink R, et al. Prevalence and risk determinants of human immunodeficiency virus type 2 (HIV-2) and human immunodeficiency virus type 1 (HIV-1) in west African female prostitutes. *Am J Epidemiol* 1992;**136**:895–907. PubMed PMID: 1442755.
22. Willerford D, Bwayo JJ, Hensel M, et al. Human immunodeficiency virus infection among high-risk seronegative prostitutes in Nairobi. *JID* 1993;**167**:1414–7.
23. Simonsen JN, Plummer FA, Ngugi EN, et al. HIV infection among lower socioeconomic strata prostitutes in Nairobi. *AIDS* 1990;**4**:139–44. PubMed PMID: 2328096.
24. Baeten JM, Richardson BA, Martin HL, et al. Trends in HIV-1 incidence in a cohort of prostitutes in Kenya: implications for HIV-1 vaccine efficacy trials. *J Acquir Immune Defic Syndr* 2000;**24**:458–64.
25. Anzala OA, Nagelkerke NJ, Bwayo JJ, et al. Rapid progression to disease in African sex workers with human immunodeficiency virus type 1 infection. *J Infect Dis* 1995;**171**:686–9. Erratum in: *J Infect Dis* 1996;**173**:1529. PubMed PMID: 7876618.
26. Ngugi EN, Plummer FA, Simonsen JN, et al. Prevention of transmission of human immunodeficiency virus in Africa: effectiveness of condom promotion and health education among prostitutes. *Lancet* 1988;**2**:887–90.
27. Mann JM, Nzilambi N, Piot P, et al. HIV infection and associated risk factors in female prostitutes in Kinshasa, Zaire. *AIDS* 1988;**2**:249–54.
28. Langley CL, Benga-De E, Critchlow CW, et al. HIV-1, HIV-2, human papillomavirus infection and cervical neoplasia in high-risk African women. *AIDS* 1996;**10**:413–17.
29. Alary M, Mukenge-Tshibaka L, Bernier F, et al. Decline in the prevalence of HIV and sexually transmitted diseases among female sex workers in Cotonou, Benin, 1993–1999. *AIDS* 2002;**16**:463–70.
30. Ohshige K, Morio S, Mizushima S, et al. Cross-sectional study on risk factors of HIV among female commercial sex workers in Cambodia. *Epidemiol Infect* 2000;**124**:143–52. PubMed PMID: 10722142; PubMed Central PMCID: PMC2810895.
31. Ohshige K, Morio S, Mizushima S, et al. Behavioural and serological human immunodeficiency virus risk factors among female commercial sex workers in Cambodia. *Int J Epidemiol* 2000;**29**:344–54. PubMed PMID: 10817135.
32. Sarkar K, Bal B, Mukherjee R, et al. Young age is a risk factor for HIV among female sex workers—an experience from India. *J Infect* 2006;**53**:255–9. Epub 2005 Dec 27. PubMed PMID: 16386307.
33. Lau JT, Zhang J, Zhang L, et al. Comparing prevalence of condom use among 15,379 female sex workers injecting or not injecting drugs in China. *Sex Transm Dis* 2007;**34**:908–16. PubMed PMID: 18049424.
34. Sarkar K, Bhattacharya S, Bhattacharyya S, et al. Oncogenic human papilloma virus and cervical pre-cancerous lesions in brothel-based sex workers in India. *J Infect Public Health* 2008;**1**:121–8. Epub 2008 Nov 12. PubMed PMID: 20701853.
35. Silverman JG, Decker MR, Gupta J, et al. HIV prevalence and predictors among rescued sex-trafficked women and girls in Mumbai, India. *J Acquir Immune Defic Syndr* 2006;**43**:588–93. PubMed PMID: 17019369.
36. Celentano DD, Akarasepi P, Sussman L, et al. HIV-1 infection among lower class commercial sex workers in Chiang Mai, Thailand. *AIDS* 1994;**8**:533–7. PubMed PMID: 8011259.
37. Nakashima K, Kashiwagi S, Hayashi J, et al. Sexual transmission of hepatitis C virus among female prostitutes and patients with sexually transmitted diseases in Fukuoka, Kyushu, Japan. *Am J Epidemiol* 1992;**136**:1132–7.
38. Wang H, Chen RY, Ding G, et al. Prevalence and predictors of HIV infection among female sex workers in Kaiyuan City, Yunnan Province, China. *Int J Infect Dis* 2009;**13**:162–9. Epub 2008 Aug 20. PubMed PMID: 18718801; PubMed Central PMCID: PMC2650737.
39. Taneepanichskul S, Phuapradit W, Chaturachinda K. Association of contraceptives and HIV-1 infection in Thai female commercial sex workers. *Aust N Z J Obstet Gynaecol* 1997;**37**:86–8. PubMed PMID: 9075554.

40. **Simoes EA**, Babu PG, Jeyakumari HM, *et al.* The initial detection of human immunodeficiency virus 1 and its subsequent spread in prostitutes in Tamil Nadu, India. *J Acquir Immune Defic Syndr* 1993;**6**:1030–4.
41. **Cambodia Ministry of Health** 1998.
42. **Cambodia Ministry of Health** 1997.
43. **Cambodia Ministry of Health** 1999.
44. **Cambodia Ministry of Health** 2001.
45. **Cambodia Ministry of Health** 2003.
46. **Cambodia Ministry of Health** 2007.
47. **Kao JH**, Chen W, Chen PJ, *et al.* GB virus-C/hepatitis G virus infection in prostitutes: possible role of sexual transmission. *J Med Virol* 1997;**52**:381–4. PubMed PMID: 9260684.
48. **Majid N**, Bollen L, Morineau G, *et al.* Syphilis among female sex workers in Indonesia: need and opportunity for intervention. *Sex Transm Infect* 2010;**86**:377–83.
49. **Mishra S**, Moses S, Hanumaiah PK, *et al.* Sex work, Syphilis, and seeking treatment: an opportunity for intervention in HIV prevention programming in Karnataka, South India. *Sex Transm Dis* 2009;**36**:157–64.
50. **Nhurod P**, Bollen LJ, Smuttrapapoot P, *et al.* Access to HIV testing for sex workers in Bangkok, Thailand: a high prevalence of HIV among street-based sex workers. *Southeast Asian J Trop Med Public Health* 2010;**41**:153–62. PubMed PMID: 20578494.
51. **Reza-Paul S**, Beattie T, Syed HU, *et al.* Declines in risk behaviour and sexually transmitted infection prevalence following a community-led HIV preventive intervention among female sex workers in Mysore, India. *AIDS* 2008;**22**(Suppl 5): S91–100.
52. **Ruan Y**, Cao X, Qian HZ, *et al.* Syphilis among female sex workers in southwestern China: potential for HIV transmission. *Sex Transm Dis* 2006;**33**:719–23. PubMed PMID: 16708055.
53. **Rugpao S**, Pruthithada N, Yutaboot Y, *et al.* Condom breakage during commercial sex in Chiang Mai, Thailand. *Contraception* 1993;**48**:537–47. PubMed PMID: 8131395.
54. **Sawayama Y**, Hayashi J, Etoh Y, *et al.* Heterosexual transmission of GB virus C/hepatitis G virus infection to non-intravenous drug-using female prostitutes in Fukuoka, Japan. *Dig Dis Sci* 1999;**44**:1937–43.
55. **Silverman JG**, Decker MR, Gupta J, *et al.* HIV prevalence and predictors of infection in sex-trafficked Nepalese girls and women. *JAMA* 2007;**298**:536–42. PubMed PMID: 17666674.
56. **Sopheah H**, Gorbach PM, Gloyd S, *et al.* Rural sex work in Cambodia: work characteristics, risk behaviours, HIV, and syphilis. *Sex Transm Infect* 2003;**79**:e2. PubMed PMID: 12902610; PubMed Central PMCID: PMC1744694.
57. **Thuy NT**, Nhung VT, Thuc NV, *et al.* HIV infection and risk factors among female sex workers in southern Vietnam. *AIDS* 1998;**12**:425–32.
58. **Todd CS**, Nasir A, Stanekzai MR, *et al.* HIV, hepatitis B, and hepatitis C prevalence and associated risk behaviors among female sex workers in three Afghan cities. *AIDS* 2010;**24**(Suppl 2):S69–75. PubMed PMID: 20610952.
59. **Tran TN**, Detels R, Long HT, *et al.* HIV infection and risk characteristics among female sex workers in Hanoi, Vietnam. *J Acquir Immune Defic Syndr* 2005;**39**:581–6. PubMed PMID: 16044011; PubMed Central PMCID: PMC2908502.
60. **van den Hoek A**, Yuliang F, Dukers NH, *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**:753–9. PubMed PMID: 11371690.
61. **Wang BO**, Xiaoming LI, Stanton B, *et al.* Vaginal douching, condom use, and sexually transmitted infections among chinese female sex workers. *Sex Transm Dis* 2005;**32**:696–702.
62. **Wong ML**, Chan RK, Koh D, *et al.* A prospective study on condom slippage and breakage among female brothel-based sex workers in Singapore. *Sex Transm Dis* 2000;**27**:208–14. PubMed PMID: 10782742.
63. **Tran TT**, Le CL, Nguyen TL. Factors associated with inconsistent condom use among female sex workers in Nha Trang, Vietnam. *Asia Pac J Public Health* 2008;**20**:370–8.
64. **Baars JE**, Boon BJ, Garretsen HF, *et al.* Vaccination uptake and awareness of a free hepatitis B vaccination program among female commercial sex workers. *Women's Health Issues* 2009;**19**:61–9. Epub 2008 Oct 25. PubMed PMID: 18951815.
65. **Vioque J**, Hernández-Aguado I, Fernández García E, *et al.* Prospective cohort study of female sex workers and the risk of HIV infection in Alicante, Spain (1986–96). *Sex Transm Infect* 1998;**74**:284–8.
66. **Ward H**, Day S, Mezzone J, *et al.* Prostitution and risk of HIV: female prostitutes in London. *BMJ* 1993;**307**:356–8. PubMed PMID: 8374417; PubMed Central PMCID: PMC1678221.
67. **Ward H**, Day S. What happens to women who sell sex? Report of a unique occupational cohort. *Sex Transm Infect* 2006;**82**:413–17. Epub 2006 Jun 21. PubMed PMID: 16790559; PubMed Central PMCID: PMC2563855.
68. **Pineda JA**, Rivero A, Rey C, *et al.* Association between hepatitis C virus seroreactivity and HIV infection in non-intravenous drug abusing prostitutes. *Eu J Clin Microbiol Infect Dis* 1995;**14**:460–4. doi: 10.1007/BF02114907
69. **Uusküla A**, Fischer K, Raudne R, *et al.* A study on HIV and hepatitis C virus among commercial sex workers in Tallinn. *Sex Transm Infect* 2008;**84**:189–91. Epub 2008 Feb 6. PubMed PMID: 18256109.
70. **McKeganey N**, Barnard M. Selling sex: female street prostitution and HIV risk behaviour in Glasgow. *AIDS Care* 1992;**4**:395–407. PubMed PMID: 1493147.
71. **Papaevangelou G**, Roumeliotou A, Kallinikos G, *et al.* Education in preventing HIV infection in greek registered prostitutes. *J Acquir Immune Defic Syndr* 1988;**1**:386–9.
72. **Pineda JA**, Aguado I, Rivero A, *et al.* HIV-1 infection among non-intravenous drug user female prostitutes in Spain. No evidence of evolution to Pattern II. *AIDS* 1992;**6**:1365–9.
73. **Loza O**, Patterson TL, Rusch M, *et al.* Proyecto Mujer Segura. Drug-related behaviors independently associated with syphilis infection among female sex workers in two Mexico-US border cities. *Addiction* 2010;**105**:1448–56. Epub 2010 Apr 27. PubMed PMID: 20456292.
74. **Bucardo J**, Semple SJ, Fraga-Vallejo M, *et al.* A qualitative exploration of female sex work. Tijuana, Mexico. *Arch Sex Behav* 2004;**33**:343–51.
75. **Szwarcwald CL**. Taxas de prevalência de HIV e sífilis e conhecimento, atitudes e práticas de risco relacionadas às infecções sexualmente transmissíveis no grupo das mulheres profissionais do sexo, no Brasil. Study funded by the STD, Aids and Viral Hepatitis Department.
76. **Hyams KC**, Phillips IA, Tejada A, *et al.* Three-year incidence study of retroviral and viral hepatitis transmission in a peruvian prostitute population. *J Acquir Immune Defic Syndr* 1993;**6**:1353–7.
77. **Sánchez J**, Gotuzzo E, Escamilla J, *et al.* Sexually transmitted infections in female sex workers: reduced by condom use but not by a limited periodic examination program. *Sex Transm Dis* 1998;**25**:82–9.
78. **Wignall FS**, Hyams KC, Phillips IA, *et al.* Sexual transmission of human T-lymphotropic virus type I in Peruvian prostitutes. *J Med Virol* 1992;**38**:44–8.
79. **Lowndes CM**, Alary M, Platt L. Injection drug use, commercial sex work, and the HIV/STI epidemic in the Russian Federation. *Sex Transm Dis* 2003;**30**:46–8.
80. **Seidlin M**, Krasinski K, Bebenroth D, *et al.* Prevalence of HIV infection in New York call girls. *J Acquir Immune Defic Syndr* 1988;**1**:150–4. PubMed PMID: 3216302.
81. **Potterat JJ**, Woodhouse DE, Muth JB, *et al.* Estimating the prevalence and career longevity of prostitute women. *J Sex Res* 1990;**27**:233–43.
82. **Casabona J**, Sánchez E, Salinas R, *et al.* Seroprevalence and risk factors for HIV transmission among female prostitutes: a community survey. *Eur J Epidemiol* 1990;**6**:248–52.
83. **Goldenberg SM**, Gallardo Cruz M, Strathee SA, *et al.* Correlates of unprotected sex with female sex workers among male clients in Tijuana, Mexico. *Sex Transm Dis* 2010;**37**:319–24. PubMed PMID: 20081558; PubMed Central PMCID: PMC2861913.
84. **Patterson TL**, Goldenberg S, Gallardo M, *et al.* Correlates of HIV, sexually transmitted infections, and associated high-risk behaviors among male clients of female sex workers in Tijuana, Mexico. *AIDS* 2009;**23**:1765–71. PubMed PMID: 19584699; PubMed Central PMCID: PMC2804438.
85. **Couture MC**, Soto JC, Akom E, *et al.* Clients of female sex workers in Gonaives and St-Marc, Haiti characteristics, sexually transmitted infection prevalence and risk factors. *Sex Transm Dis* 2008;**35**:849–55. PubMed PMID: 18580821.
86. **Jin X**, Smith K, Chen RY, *et al.* HIV prevalence and risk behaviors among male clients of female sex workers in Yunnan, China. *J Acquir Immune Defic Syndr* 2010;**53**:131–5. PubMed PMID: 19730110; PubMed Central PMCID: PMC2799544.
87. **Subramanian T**, Gupte MD, Paranjape RS, *et al.* HIV, sexually transmitted infections and sexual behaviour of male clients of female sex workers in Andhra Pradesh, Tamil Nadu and Maharashtra, India: results of a cross-sectional survey. *AIDS* 2008;**22**(Suppl 5):S69–79. PubMed PMID: 19098481.
88. **Xantidis L**, McCabe MP. Personality characteristics of male clients of female commercial sex workers in Australia. *Arch Sex Behav* 2000;**29**:165–76. PubMed PMID: 10842724.
89. **Lowndes CM**, Alary M, Gnintoungbé CA, *et al.* Management of sexually transmitted diseases and HIV prevention in men at high risk: targeting clients and non-paying sexual partners of female sex workers in Benin. *AIDS* 2000;**14**:2523–34. PubMed PMID: 11101064.
90. **Voeten HA**, Egesah OB, Ondiege MY, *et al.* Clients of female sex workers in Nyanza province, Kenya: a core group in STD/HIV transmission. *Sex Transm Dis* 2002;**29**:444–52. PubMed PMID: 12172528.
91. **McCurdy SA**, Ross MW, Williams ML, *et al.* Flashblood: blood sharing among female injecting drug users in Tanzania. *Addiction* 2010;**105**:1062–70. Epub 2010 Mar 12.
92. **Mahanta J**, Medhi GK, Paranjape RS, *et al.* Injecting and sexual risk behaviours, sexually transmitted infections and HIV prevalence in injecting drug users in three states in India. *AIDS* 2008;**22**(Suppl 5):S59–68.
93. **Ross M**, McCurdy S, Kilongo G, *et al.* Drug use careers and blood-borne pathogen risk behavior in male and female Tanzanian heroin injectors. *Am J Trop Med Hyg* 2008;**79**:338–43.
94. **Wright NH**, Vanichseni S, Akarasevi P, *et al.* Was the 1988 HIV epidemic among Bangkok's injecting drug users a common source outbreak? *AIDS* 1994;**8**:529–32.

95. **Buavirat A**, Page-Shafer K, van Griensven GJ, *et al.* Risk of prevalent HIV infection associated with incarceration among injecting drug users in Bangkok, Thailand: case-control study. *BMJ* 2003;**326**:308.
96. **Go VF**, Frangakis C, Nam LV, *et al.* Characteristics of high-risk HIV-positive IDUs in Vietnam: implications for future interventions. *Subst Use Misuse* 2011;**46**:381–9.
97. **Kermode M**, Singh LB, Raju RK, *et al.* Injections for health-related reasons amongst injecting drug users in New Delhi and Imphal, India. *Public Health* 2006;**120**:634–40. Epub 2006 Jun 5.
98. **Lee KC**, Lim WW, Lee SS. High prevalence of HCV in a cohort of injectors on methadone substitution treatment. *J Clin Virol* 2008;**41**:297–300. Epub 2008 Jan 10.
99. **Azim T**, Chowdhury EI, Reza M, *et al.* Prevalence of infections, HIV risk behaviors and factors associated with HIV infection among male injecting drug users attending a needle/syringe exchange program in Dhaka, Bangladesh. *Subst Use Misuse* 2008;**43**:2124–44.
100. **Bautista CT**, Todd CS, Abed AM, *et al.* Effects of duration of injection drug use and age at first injection on HCV among IDU in Kabul, Afghanistan. *J Public Health (Oxf)* 2010;**32**:336–41. Epub 2010 Apr 26.
101. **Beyrer C**, Patel Z, Stachowiak JA, *et al.* Characterization of the emerging HIV type 1 and HCV epidemics among injecting drug users in Dushanbe, Tajikistan. *AIDS Res Hum Retroviruses* 2009;**25**:853–60.
102. **Niccolai LM**, Verevchkin SV, Tousseva OV, *et al.* Estimates of HIV incidence among drug users in St. Petersburg, Russia: continued growth of a rapidly expanding epidemic. *Eur J Public Health* 2011;**21**:613–9.
103. **Quan VM**, Go VF, Nam le V, *et al.* Risks for HIV, HBV, and HCV infections among male injection drug users in northern Vietnam: a case-control study. *AIDS Care* 2009;**21**:7–16.
104. **Todd CS**, Abed AM, Scott PT, *et al.* Correlates of receptive and distributive needle sharing among injection drug users in Kabul, Afghanistan. *Am J Drug Alcohol Abuse* 2008;**34**:91–100.
105. **Altat A**, Shah SA, Zaidi NA, *et al.* High risk behaviors of injection drug users registered with harm reduction programme in Karachi, Pakistan. *Harm Reduct J* 2007;**4**:7.
106. **Azim T**, Chowdhury EI, Reza M, *et al.* Vulnerability to HIV infection among sex worker and non-sex worker female injecting drug users in Dhaka, Bangladesh: evidence from the baseline survey of a cohort study. *Harm Reduct J* 2006;**3**:33.
107. **Zhao M**, Du J, Lu GH, *et al.* HIV sexual risk behaviors among injection drug users in Shanghai. *Drug Alcohol Depend* 2006;**82**(Suppl 1):S43–7.
108. **Stoové MA**, Dietze PM, Aitken CK, *et al.* Mortality among injecting drug users in Melbourne: a 16-year follow-up of the Victorian Injecting Cohort Study (VICS). *Drug Alcohol Depend* 2008;**96**:281–5. Epub 2008 Apr 22.
109. **Maher L**, Li J, Jalaludin B, *et al.* High hepatitis C incidence in new injecting drug users: a policy failure? *Aust N Z J Public Health* 2007;**31**:30–5.
110. **Darke S**, Kelly E, Ross J. Drug driving among injecting drug users in Sydney, Australia: prevalence, risk factors and risk perceptions. *Addiction* 2004;**99**:175–85.
111. **Day C**, Conroy E, Lowe J, *et al.* Patterns of drug use and associated harms among rural injecting drug users: comparisons with metropolitan injecting drug users. *Aust J Rural Health* 2006;**14**:120–5.
112. **Iversen J**, Wand H, Gonnermann A, *et al.* Gender differences in hepatitis C antibody prevalence and risk behaviours amongst people who inject drugs in Australia 1998–2008. *Int J Drug Policy* 2010;**21**:471–6.
113. **Lenton S**, Kerry K, Loxley W, *et al.* Citizens who inject drugs: the 'Fitpack' study. *Int J Drug Policy* 2000;**11**:285–97.
114. **White JM**, Dyer KR, Ali RL, *et al.* Injecting behaviour and risky needle use amongst methadone maintenance clients. *Drug Alcohol Depend* 1994;**34**:113–19.
115. **Miller ER**, Hellard ME, Bowden S, *et al.* Markers and risk factors for HCV, HBV and HIV in a network of injecting drug users in Melbourne, Australia. *J Infect* 2009;**58**:375–82. Epub 2009 Mar 27.
116. **Bryant J**, Treloar C. Initiators: an examination of young injecting drug users who initiate others to injecting. *AIDS Behav* 2008;**12**:885–90. Epub 2007 Dec 21.
117. **Hellard ME**, Nguyen OK, Guy RJ, *et al.* The prevalence and risk behaviours associated with the transmission of blood-borne viruses among ethnic-Vietnamese injecting drug users. *Aust N Z J Public Health* 2006;**30**:519–25.
118. **Cao W**, Treloar C. Comparison of needle and syringe programme attendees and non-attendees from a high drug-using area in Sydney, New South Wales. *Drug Alcohol Rev* 2006;**25**:439–44.
119. **Roxburgh A**, Degenhardt L, Breen C. Drug use and risk behaviours among injecting drug users: a comparison between sex workers and non-sex workers in Sydney, Australia. *Harm Reduct J* 2005;**2**:7.
120. **Copeland L**, Budd J, Robertson JR, *et al.* Changing patterns in causes of death in a cohort of injecting drug users, 1980–2001. *Arch Intern Med* 2004;**164**:1214–20.
121. **Smyth BP**, Keenan E, O'Connor JJ. Evaluation of the impact of Dublin's expanded harm reduction programme on prevalence of hepatitis C among short-term injecting drug users. *J Epidemiol Community Health* 1999;**53**:434–5.
122. **Karapetyan AF**, Sokolovsky YV, Araviyskaya ER, *et al.* Syphilis among intravenous drug-using population: epidemiological situation in St. Petersburg, Russia. *Int J STD AIDS* 2002;**13**:618–23.
123. **Stormer A**, Tun W, Guli L, *et al.* An analysis of respondent driven sampling with Injection Drug Users (IDU) in Albania and the Russian Federation. *J Urban Health* 2006;**83**(6 Suppl):i73–82.
124. **De los Cobos Calleja T**, Casanueva Gutiérrez M, Jove González C. Perfil de los usuarios de drogas ingresados en un hospital. *An Med Interna (Madrid)* 2003;**20**:504–9.
125. **Cassin S**, Geoghegan T, Cox G. Young injectors: a comparative analysis of risk behaviour. *Ir J Med Sci* 1998;**167**:234–7.
126. **Dolan KA**, Donoghoe MC, Stimson GV. Reductions in HIV risk behaviour and stable HIV prevalence in syringe-exchange clients and other injectors in England. *Drug Alcohol Rev* 1993;**12**:133–42.
127. **Lidman C**, Norden L, Käberg M, *et al.* Hepatitis C infection among injection drug users in Stockholm Sweden: prevalence and gender. *Scand J Infect Dis* 2009;**41**:679–84.
128. **Muga R**, Roca J, Egea JM, *et al.* Mortality of HIV-positive and HIV-negative heroin abusers as a function of duration of injecting drug use. *J Acquir Immune Defic Syndr* 2000;**23**:332–8.
129. **Rhodes T**, Donoghoe M, Hunter G, *et al.* Sexual behaviour of drug injectors in London: implications for HIV transmission and HIV prevention. *Addiction* 1994;**89**:1085–96.
130. **Steffen T**, Blättler R, Gutzwiller F, *et al.* HIV and hepatitis virus infections among injecting drug users in a medically controlled heroin prescription programme. *Eur J Public Health* 2001;**11**:425–30.
131. **Gyarmathy VA**, Neaigus A, Li N, *et al.* Infection disclosure in the injecting dyads of Hungarian and Lithuanian injecting drug users who self-reported being infected with hepatitis C virus or human immunodeficiency virus. *Scand J Infect Dis* 2011;**43**:32–42.
132. **Kolaric B**, Stajduhar D, Gajnik D, *et al.* Seroprevalence of blood-borne infections and population sizes estimates in a population of injecting drug users in Croatia. *Cent Eur J Public Health* 2010;**18**:104–9.
133. **Vlahov D**, Safaie M, Lai S, *et al.* Sexual and drug risk-related behaviours after initiating highly active antiretroviral therapy among injection drug users. *AIDS* 2007;**15**:2311–16.
134. **Hickman M**, Hope V, Brady T, *et al.* Hepatitis C virus (HCV) prevalence, and injecting risk behaviour in multiple sites in England in 2004. *J Viral Hepat* 2007;**14**:645–52.
135. **Folch C**, Meroño M, Casabona J. Factors associated with sharing syringes among street-recruited injecting drug users. *Med Clin (Barc)* 2006;**127**:526–32.
136. **Booth RE**, Kwiatkowski CF, Brewster JT, *et al.* Predictors of HIV sero-status among drug injectors at three Ukraine sites. *AIDS* 2006;**20**:2217–23.
137. **Muga R**, Sanvisens A, Bolao F, *et al.* Significant reductions of HIV prevalence but not of hepatitis C virus infections in injection drug users from metropolitan Barcelona: 1987–2001. *Drug Alcohol Depend* 2006;**82**(Suppl 1):S29–33.
138. **Backmund M**, Meyer K, Schuetz C, *et al.* Factors associated with exposure to hepatitis B virus in injection drug users. *Drug Alcohol Depend* 2006;**84**:154–9. Epub 2006 Feb 14.
139. **Platt L**, Rhodes T, Lowndes CM, *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. *Sex Transm Dis* 2005;**32**:605–12.
140. **Gyarmathy VA**, Neaigus A. Marginalized and socially integrated groups of IDUs in Hungary: potential bridges of HIV infection. *J Urban Health* 2005;**82**(3 Suppl 4):iv101–12.
141. **Maliphant J**, Scott J. Use of the femoral vein ('groin injecting') by a sample of needle exchange clients in Bristol, UK. *Harm Reduct J* 2005;**2**:6.
142. **Kivelä P**, Krol A, Simola S, *et al.* HIV outbreak among injecting drug users in the Helsinki region: social and geographical pockets. *Eur J Public Health* 2007;**17**:381–6. Epub 2006 Nov 27.
143. **de Azevedo RC**, Botega NJ, Guimarães LA. Crack users, sexual behavior and risk of HIV infection. *Rev Bras Psiquiatr* 2007;**29**:26–30.
144. **Marchesini AM**, Prá-Baldi ZP, Mesquita F, *et al.* Hepatitis B and C among injecting drug users living with HIV in São Paulo, Brazil. *Rev Saude Publica* 2007;**41**(Suppl 2):57–63.
145. **Dourado I**, Andrade T, Carpenter C, *et al.* Risk factors for human T cell lymphotropic virus Type I among injecting drug users in northeast Brazil: possibly greater efficiency of male to female transmission. *Mem Inst Oswaldo Cruz, Rio de Janeiro* 1999;**94**:13–8.
146. **Lima ES**, Friedman SR, Bastos FI, *et al.* Risk factors for HIV-1 seroprevalence among drug injectors in the cocaine-using environment of Rio de Janeiro. *Addiction* 1994;**89**:689–98.
147. **Oliveira Mde L**, Bastos FI, Telles PR, *et al.* Epidemiological and genetic analyses of Hepatitis C virus transmission among young/short- and long-term injecting drug users from Rio de Janeiro, Brazil. *J Clin Virol* 2009;**44**:200–6. Epub 2009 Feb 4.
148. **Caiaffa WT**, Bastos FI, Freitas LL, *et al.* Projeto AJUDE-Brasil I; Projeto AJUDE-Brasil II. The contribution of two Brazilian multi-center studies to the assessment of HIV and HCV infection and prevention strategies among injecting drug users: the AJUDE-Brasil I and II Projects. *Cad Saude Publica* 2006;**22**:771–82. Epub 2006 Apr 5.

149. **Huo D**, Bailey SL, Ouellet LJ. Cessation of injection drug use and change in injection frequency: the Chicago needle exchange evaluation study. *Addiction* 2006;**101**:1606–13.
150. **Hahn JA**, Page-Shafer K, Lum PJ, *et al.* Hepatitis C virus infection and needle exchange use among young injection drug users in San Francisco. *Hepatology* 2001;**34**:180–7.
151. **Miller CL**, Johnston C, Spittal PM, *et al.* Opportunities for prevention: hepatitis C prevalence and incidence in a cohort of young injection drug users. *Hepatology* 2002;**36**:737–42.
152. **Neaigus A**, Friedman SR, Jose B, *et al.* High-risk personal networks and syringe sharing as risk factors for HIV infection among new drug injectors. *J Acquir Immune Defic Syndr Hum Retrovirol* 1996;**11**:499–509.
153. **Roy E**, Boudreau JF, Boivin JF. Hepatitis C virus incidence among young street-involved IDUs in relation to injection experience. *Drug Alcohol Depend* 2009;**102**:158–61. Epub 2009 Feb 28.
154. **Chitwood DD**, Comerford M, Kitner KR, *et al.* A comparison of HIV risk behaviors between new and long-term injection drug users. *Subst Use Misuse* 2001;**36**:91–111.
155. **Corsi KF**, Lehman WK, Booth RE. The effect of methadone maintenance on positive outcomes for opiate injection drug users. *J Subst Abuse Treat* 2009;**37**:120–6. Epub 2009 Jan 15.
156. **Debeck K**, Kerr T, Bird L, *et al.* Injection drug use cessation and use of North America's first medically supervised safer injecting facility. *Drug Alcohol Depend* 2011;**113**:172–6.
157. **Doherty MC**, Garfein RS, Monterroso E, *et al.* Correlates of HIV infection among young adult short-term injection drug users. *AIDS* 2000;**14**:717–26.
158. **Garfein RS**, Doherty MC, Monterroso ER, *et al.* Prevalence and incidence of hepatitis C virus infection among young adult injection drug users. *J Acquir Immune Defic Syndr Hum Retrovirol* 1998;**18**(Suppl 1):S11–19.
159. **Mehta SH**, Galai N, Astemborski J, *et al.* HIV incidence among injection drug users in Baltimore, Maryland (1988–2004). *J Acquir Immune Defic Syndr* 2006;**43**:368–72.
160. **Pouget ER**, Deren S, Fuller CM, *et al.* Receptive syringe sharing among injection drug users in Harlem and the Bronx during the New York State Expanded Syringe Access Demonstration Program. *J Acquir Immune Defic Syndr* 2005;**39**:471–7.
161. **Schütz CG**, Rapioti E, Vlahov D, *et al.* Suspected determinants of enrollment into detoxification and methadone maintenance treatment among injecting drug users.
162. **Steensma C**, Boivin JF, Blais L, *et al.* Cessation of injecting drug use among street-based youth. *J Urban Health* 2005;**82**:622–37. Epub 2005 Sep 29.
163. **Wood E**, Stoltz JA, Zhang R, *et al.* Circumstances of first crystal methamphetamine use and initiation of injection drug use among high-risk youth. *Drug Alcohol Rev* 2008;**27**:270–6.
164. **Evans JL**, Hahn JA, Lum PJ, *et al.* Predictors of injection drug use cessation and relapse in a prospective cohort of young injection drug users in San Francisco, CA (UFO Study). *Drug Alcohol Depend* 2009;**101**:152–7. Epub 2009 Jan 31. *Drug Alcohol Depend* 2009;**101**:152–7. Epub 2009 Jan 31.
165. **Lum PJ**, Hahn JA, Shafer KP, *et al.* Hepatitis B virus infection and immunization status in a new generation of injection drug users in San Francisco. *J Viral Hepat* 2008;**15**:229–36.
166. **Shaw SY**, Shah L, Jolly AM, *et al.* Determinants of injection drug user (IDU) syringe sharing: the relationship between availability of syringes and risk network member characteristics in Winnipeg, Canada. *Addiction* 2007;**102**:1626–35.
167. **Neaigus A**, Gyarmathy VA, Miller M, *et al.* Injecting and sexual risk correlates of HBV and HCV seroprevalence among new drug injectors. *Drug Alcohol Depend* 2007;**89**:234–43. Epub 2007 Feb 7.
168. **Hagan H**, Campbell J, Thiede H, *et al.* Self-reported hepatitis C virus antibody status and risk behavior in young injectors. *Public Health Rep* 2006;**121**:710–19.
169. **Miller CL**, Kerr T, Strathdee SA, *et al.* Factors associated with premature mortality among young injection drug users in Vancouver. *Harm Reduct J* 2007;**4**:1.
170. **Wylie JL**, Shah L, Jolly AM. Demographic, risk behaviour and personal network variables associated with prevalent hepatitis C, hepatitis B, and HIV infection in injection drug users in Winnipeg, Canada. *BMC Public Health* 2006;**6**:229.
171. **Miller CL**, Strathdee SA, Spittal PM, *et al.* Elevated rates of HIV infection among young Aboriginal injection drug users in a Canadian setting. *Harm Reduct J* 2006;**3**:9.
172. **Lum PJ**, Sears C, Guydish J. Injection risk behavior among women syringe exchangers in San Francisco. *Subst Use Misuse* 2005;**40**:1681–96.
173. **Pugatch D**, Anderson BJ, O'Connell JV, *et al.* HIV and HCV testing for young drug users in Rhode Island. *J Adolesc Health* 2006;**38**:302–4.
174. **Hart TA**, James CA, Hagan CM, *et al.* HIV optimism and high-risk sexual behavior in two cohorts of men who have sex with men. *J Assoc Nurses AIDS Care* 2010;**21**:439–43. Epub 2010 Jul 24. PubMed PMID: 20656521.
175. **Golub SA**, Kowalczyk W, Weinberger CL, *et al.* Preexposure prophylaxis and predicted condom use among high-risk men who have sex with men. *J Acquir Immune Defic Syndr* 2010;**54**:548–55. PubMed PMID: 20512046; PubMed Central PMCID: PMC2908204.
176. **Carey JW**, Mejia R, Bingham T, *et al.* Drug use, high-risk sex behaviors, and increased risk for recent HIV infection among men who have sex with men in Chicago and Los Angeles. *AIDS Behav* 2009;**13**:1084–96. Epub 2008 May 23. PubMed PMID: 18498049.
177. **Dodds JP**, Johnson AM, Parry JV, *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. *Sex Transm Infect* 2007;**83**:392–6. Epub 2007 May 1. Erratum in: *Sex Transm Infect* 2007;**83**:500. PubMed PMID: 17472978; PubMed Central PMCID: PMC2659037.
178. **Danta M**, Brown D, Bhagani S, *et al.* HIV and Acute HCV (HAAC) group. Recent epidemic of acute hepatitis C virus in HIV-positive men who have sex with men linked to high-risk sexual behaviours. *AIDS* 2007;**21**:983–91. PubMed PMID: 17457092.
179. **Koblin BA**, Chesney MA, Husnik MJ, *et al.* EXPLORE Study Team. High-risk behaviors among men who have sex with men in 6 US cities: baseline data from the EXPLORE Study. *Am J Public Health* 2003;**93**:926–32. Erratum in: *Am J Public Health* 2003;**93**:1203. PubMed PMID: 12773357; PubMed Central PMCID: PMC1447872.
180. **Thomas SM**, Tse DB, Ketner DS, *et al.* CCR5 expression and duration of high risk sexual activity among HIV-seronegative men who have sex with men. *AIDS* 2006;**20**:1879–83. PubMed PMID: 16954729; PubMed Central PMCID: PMC1630600.
181. **Mansergh G**, Flores S, Koblin B, *et al.* Project MIX Study Group. Alcohol and drug use in the context of anal sex and other factors associated with sexually transmitted infections: results from a multi-city study of high-risk men who have sex with men in the USA. *Sex Transm Infect* 2008;**84**:509–11. PubMed PMID: 19028957.

Table S1. Data extracted from studies conducted in the Male Clients of Female Sex Workers population

Region	Reference	Methodology	Sample size	Sample definition	Age	Year of data collection	Location	Duration of period paying for sex
Latin America	Goldenberg SM, Gallardo Cruz M, Strathdee SA, Nguyen L, Semple SJ, Patterson TL. Correlates of unprotected sex with female sex workers among male clients in Tijuana, Mexico. Sex Transm Dis. 2010 May;37(5):319-24. PubMed PMID: 20081558; PubMed Central PMCID: PMC2861913.	Cross-sectional	394	Male aged 18 or older who had paid or traded for sex with a FSW in Tijuana during the past 4 months were recruited in Tijuana's Zona Roja.	Median: 36 (IQR: 28–44)	2008	Tijuana, Mexico	Median (IQR): 7 (2, 17)
Latin America	Patterson TL, Goldenberg S, Gallardo M, Lozada R, Semple SJ, Orozovich P, Abramovitz D, Strathdee SA. Correlates of HIV, sexually transmitted infections, and associated high-risk behaviors among male clients of female sex workers in Tijuana, Mexico. AIDS. 2009 Aug 24;23(13):1765-71. PubMed PMID: 19584699; PubMed Central PMCID: PMC2804438.	Cross-sectional	343	To be eligible, men had to be residents of Tijuana or San Diego County, of 18 years or older, and to have paid or traded for sex with a FSW in Tijuana during the past 4 months.	Mean: 36.6 (range: 19–68 years),	2008	Tijuana, Mexico	They had been having sex with FSWs for 10.8 years
Central America	Couture MC, Soto JC, Akom E, Labbé AC, Joseph G, Zunzunegui MV. Clients of female sex workers in Gonaives and St-Marc, Haiti characteristics, sexually transmitted infection prevalence and risk factors. Sex Transm Dis. 2008 Oct;35(10):849-55. PubMed PMID: 18580821.	Cross-sectional	378	A client was defined as a man who was present at the commercial sex site during fieldwork and who had had a sexual encounter in the last 3 months with an FSW for which he had paid in money or goods.	Mean: 24	December and January 2006–2007	St-Marc and Gonaives, Haiti	The majority had been frequenting FSWs for 4 years or more (64.0%; mean 6.3 years).

Region	Reference	Methodology	Sample size	Sample definition	Age	Year of data collection	Location	Duration of period paying for sex
Asia	Jin X, Smith K, Chen RY, Ding G, Yao Y, Wang H, Qian HZ, Chang D, Wang G, Wang N. HIV prevalence and risk behaviors among male clients of female sex workers in Yunnan, China. J Acquir Immune Defic Syndr. 2010 Jan 1;53(1):131-5. PubMed PMID: 19730110; PubMed Central PMCID: PMC2799544.	Cross-sectional	315		Median: 36 (IQR, 23–45)	2008	Yunnan, China	Median of 30 years, calculated by subtracting from the median age, the median age at first paid sex.
Asia	Subramanian T, Gupte MD, Paranjape RS, Brahman GN, Ramakrishnan L, Adhikary R, Kangusamy B, Thomas BE, Kallam S, Girish CP; IBBA Study Team. HIV, sexually transmitted infections and sexual behaviour of male clients of female sex workers in Andhra Pradesh, Tamil Nadu and Maharashtra, India: results of a cross-sectional survey. AIDS. 2008 Dec;22 Suppl 5:S69-79. PubMed PMID: 19098481.	Cross-sectional	4821	Clients of FSW, operationally defined as men between 18 and 60 years of age who had sex with FSW in exchange for money within the past month were eligible for participation.	Median: 30	Between October 2006 and June 2007	12 districts in three states in India: Andhra Pradesh, Maharashtra and Tamil Nadu	9 years, calculated by subtracting from the median age, the median age at first paid sex.
Oceania	Xantidis L, McCabe MP. Personality characteristics of male clients of female commercial sex workers in Australia. Arch Sex Behav. 2000 Apr;29(2):165-76. PubMed PMID: 10842724.	Cross-sectional	60		Mean: 32.83 (SD: 8.47)		Melbourne, Australia	Mean of 9.74, calculated by subtracting from the mean age, the mean age at first paid sex.

Region	Reference	Methodology	Sample size	Sample definition	Age	Year of data collection	Location	Duration of period paying for sex
Africa	Lowndes CM, Alary M, Gnintoungbé CA, Bédard E, Mukenge L, Geraldo N, Jossou P, Lafia E, Bernier F, Baganizi E, Joly J, Frost E, Anagonou S. Management of sexually transmitted diseases and HIV prevention in men at high risk: targeting clients and non-paying sexual partners of female sex workers in Benin. AIDS. 2000 Nov 10;14(16):2523-34. PubMed PMID: 11101064.	Cross-sectional	330	Men who came to one of the prostitution venues where the project was working, and who paid to have sex with a female sex worker there.	Median: 25.5 (IQR: 17,53)	1998	Cotonou, Benin	Median of 2 years, average of 4 years (range: 0±29 years). 21.9% have been visiting a FSW for less than a year
Africa	Voeten HA, Egesah OB, Ondiege MY, Varkevisser CM, Habbema JD. Clients of female sex workers in Nyanza province, Kenya: a core group in STD/HIV transmission. Sex Transm Dis. 2002 Aug;29(8):444-52. PubMed PMID: 12172528.	Cross-sectional	64		Median: 31 (range: 20, 58)	1999	Kisumu and the rural districts Siaya and Bondo, Kenya	7 years, calculated by subtracting from the median age, the median age at first paid sex.

Table S2. Data extracted from studies conducted in the female sex workers population

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Alary M, Mukenge-Tshibaka L, Bernier F, et al. Decline in the prevalence of HIV and sexually transmitted diseases among female sex workers in Cotonou, Benin, 1993-1999. AIDS. 2002 Feb 15;16(3):463-70.	Cross-sectional study	365	Those who consulted for STD screening at the clinic dedicated to FSW.	Mean age was 30 years and mean of number of clients on the previous week was 26.	1995 to 1996	Cotonou, Benin	Mean of 2.4 years
Africa	Alary M, Mukenge-Tshibaka L, Bernier F, et al. Decline in the prevalence of HIV and sexually transmitted diseases among female sex workers in Cotonou, Benin, 1993-1999. AIDS. 2002 Feb 15;16(3):463-70.	Cross-sectional study	591	Those who consulted for STD screening at the clinic dedicated to FSW.	Mean age was 28.4 years and mean of number of clients on the previous week was 13	1998 to 1999	Cotonou, Benin	Mean of 2.6 years
Africa	Asamoah-Adu C, Khonde N, Avorkliah M, et al. HIV infection among sex workers in Accra: need to target new recruits entering the trade. J Acquir Immune Defic Syndr. 2001 Dec 1;28(4):358-66. PubMed PMID: 11707673.	Cross-sectional study	1013 FSW	SW working out of their homes (seaters) or finding customers in bars, hotels, brothels or on the street (roamers) attending STI clinics.	Age ranged from 13 to 67 years (median, 28 years)	March 1997 to February 1999	Accra, Ghana	From 1 week to 30 years (median, 2 years)

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Dada AJ, Ajayi AO, Diamondstone L, et al. A Serosurvey of Haemophilus ducreyi, Syphilis, and Herpes Simplex Virus Type 2 and Their Association With Human Immunodeficiency Virus Among Female Sex Workers in Lagos, Nigeria. Sex Transm Dis. 1998 May;25(5):237-42.	Cross-sectional study	84 lower-class FSW	Home-based FSW that charged no more than 0.5 dollars for sexual encounter.	Mean age was 29 (IC95%: 27.5 - 30.5) and mean number of clients last day was 4.92.	1990 to 1991	Lagos, Nigeria	Mean of duration of sex work in months: 39.2 (IC 95%: 32.7 - 45.1)
Africa	Dada AJ, Ajayi AO, Diamondstone L, et al. A Serosurvey of Haemophilus ducreyi, Syphilis, and Herpes Simplex Virus Type 2 and Their Association With Human Immunodeficiency Virus Among Female Sex Workers in Lagos, Nigeria. Sex Transm Dis. 1998 May;25(5):237-42.	Cross-sectional study	624 middle class FSW	Motel-based FSW that charged from 0.5 to less than 5 dollars per sexual encounter.	Mean age was 26.3 (IC95%: 25.9 - 26.7) and mean number of clients last day was 5.76.	1990 to 1991	Lagos, Nigeria	Mean of duration of sex work in months: 35.3 (IC 95%: 32.6 - 36.6)
Africa	Dada AJ, Ajayi AO, Diamondstone L, et al. A Serosurvey of Haemophilus ducreyi, Syphilis, and Herpes Simplex Virus Type 2 and Their Association With Human Immunodeficiency Virus Among Female Sex Workers in Lagos, Nigeria. Sex Transm Dis. 1998 May;25(5):237-42.	Cross-sectional study	88 upper class FSW	FSW that solicited clients in streets, international hotels, night clubs and casinos.	Mean age was 23.3 (IC95%: 22.4 - 24.2) and mean number of clients last day was 1.93	1990 to 1991	Lagos, Nigeria	Mean of duration of sex work in months: 22.6 (IC 95%: 19.2 - 25.1)

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Delaporte E, Buvé A, Nzila N, et al. HTLV-I infection among prostitutes and pregnant women in Kinshasa, Zaïre: how important is high-risk sexual behavior? J Acquir Immune Defic Syndr Hum Retrovirol. 1995 Apr 15;8(5):511-5. PubMed PMID: 7697449.	Cross-sectional study	1183 FSW		55% were 25 years old or less.	Between May 1988 and August 1988.	Kinshasa, República Democrática do Congo	16.8% were working for less than a year; 48.5% from 1 year to less than 5 years; 23% were sex workers for five to less than 10 years and; 11.7% were working for 10 or more years.
Africa	Fowke KR, Nagelkerke NJ, Kimani J, et al. Resistance to HIV-1 infection among persistently seronegative prostitutes in Nairobi, Kenya. Lancet. 1996 Nov 16;348(9038):1347-51. PubMed PMID: 8918278.	Community-based cohort study of incident HIV-1 infection	424 FSW	All FSW in the area were eligible, but they had to be initially HIV-1-seronegative.	40% were sex workers for less than 3 years and the rest for more than 3 years.	Between 1985 and 1994	In a slum area of Nairobi, Kenya	

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Ghys PD, Diallo MO, Ettiègne-Traoré V, Kalé K, Tawil O, Caraël M, Traoré M, Mah-Bi G, De Cock KM, Wiktor SZ, Laga M, Greenberg AE. Increase in condom use and decline in HIV and sexually transmitted diseases among female sex workers in Abidjan, Côte d'Ivoire, 1991-1998. AIDS. 2002 Jan 25;16(2):251-8. PubMed PMID: 11807310	Multiyear cross-sectional study and biannual community-based behavioral surveys.	356 in 1992; 778 in 1993; 607 in 1994; 832 in 1995; 916 in 1996; 576 in 1997; and 853 in 1998. 2281 interviewed in the community-based surveys (329, 602, 850, and 500 female sex workers participated in 1991, 1993, 1995, and 1997 respectively.	Sex workers who attended Clinique de Confiance for the first time and FSW interviewed during the community based surveys.	Clinique: median age 30 in 1992 compared with 23 in 1998. Survey: median age was 26 in 1991, 28 in 1993, 25 in 1995, 26 in 1997.	From 1991 to 1998	Abidjan, Côte d'Ivoire	Clinique: median of 3 years from 1992 to 1994; 2 years in 1995 and 1996; 1.5 in 1997 and 0.6 in 1998. Survey: median of 2 years in 1991 (IQR:1 to 4); 3 years in 1993 (IQR: 2 to 5); 3 years in 1995 (IQR:1 to 5); and 2 years in 1997 (IQR: 0.7 to 4).
Africa	Jennes W, Sawadogo S, Koblavi-Dème S, Vuylsteke B, Maurice C, Roels TH, Chorba T, Nkengasong JN, Kestens L. Cellular human immunodeficiency virus (HIV)-protective factors: a comparison of HIV-exposed seronegative female sex workers and female blood donors in Abidjan, Côte d'Ivoire. J Infect Dis. 2003 Jan 15;187(2):206-14. Epub 2002 Dec 30.	Ongoing surveillance study in a Confidential clinic	40 HIV-seronegative and 25 HIV seropositive FSWs		The median age of the 40 seronegative was 22 years (IQR:21–28 years), compared with 28 years (IQR,23–36 years) for the 25 HIV-seropositive FSWs .	During the months of May 2000, February, and March 2001, and October 2001	Abidjan, Côte d'Ivoire	The median duration of commercial sex work reported by seronegative FSWs was 14months (IQR:6–36months).

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Jennes W, Vuylsteke B, Borget MY, et al. HIV-specific T helper responses and frequency of exposure among HIV-exposed seronegative female sex workers in Abidjan, Cote d'Ivoire. J Infect Dis. 2004 Feb 15;189(4):602-10. Epub 2004 Jan 29. PubMed PMID:14767812.	Cross-sectional study.	27 FSW	HIV-seronegative FSWs were enrolled	The mean age was 23 years (range, 18–52 years)	November 1999 and May 2000	Abidjan, Côte d'Ivoire	The median was 6 months (range, 1–120 months). Three FSWs (11%) reported doing commercial sex work for 3 years or more, 11 (41%) from 6 months to 3 years, and 13 (48%) for 6 months or less..
Africa	Kaul R, Kimani J, Nagelkerke Njet al. Risk factors for genital ulcerations in Kenyan sex workers. The role of human immunodeficiency virus type 1 infection. Sex Transm Dis. 1997 Aug;24(7):387-92. PubMed PMID: 9263358.	Subsample from a cohort study, was stratified to result in a 50% HIV-1 seroprevalence within the subcohort at enrollment.	302 FSW		One hundred fifty-seven women (52%) were initially HIV-1 seropositive, and 145 were seronegative. The mean age of the seronegative was 30.7 (SD: 7) and the mean age of the seropositive was 31.5 (SD: 5.2).	Cohort was established in 1991.	The Pumwani slum area of Nairobi, Kenya	The mean duration of prostitution of the seronegative was 5.4 (SD: 5.4) and for the seropositive was 6.0 (SD: 4.4).

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Lavreys L, Chohan V, Overbaugh J, et al. Hormonal contraception and risk of cervical infections among HIV-1-seropositive Kenyan women. AIDS. 2004 Nov 5;18(16):2179-84. PubMed PMID: 15577651373:	A prospective cohort study of 242 commercial sex workers in Mombasa, Kenya, followed from the time of HIV-1 infection.	242 FSW who seroconverted during the study.	Seronegative FSW attending a municipal STI clinic enrolled in the cohort.	Median age was 29 (IQR: 25 to 34)	Between February 1993 and January 2003,	Mombasa, Kenya	Median duration of prostitution was 4 years (IQR: 2 to 6).
Africa	Mulanga-Kabeya C, Morel E, Patrel Det al. Prevalence and risk assessment for sexually transmitted infections in pregnant women and female sex workers in Mali: is syndromic approach suitable for screening? Sex Transm Inf. 1999; 75: 358-360.	A cross-sectional study.	284 FSW	191 in Bamako ang 93 in Sikasso	Mean age was 27 years.	Jun-97	Sikasso and Bamako, Mali	Mean duration of 4.2 years.
Africa	Nagot N, Ouangré A, Ouedraogo A, et al. Spectrum of Commercial Sex Activity in Burkina Faso: Classification Model and Risk of Exposure to HIV. J Acquir Immune Defic Syndr. 2002 Apr 15;29(5):517-21.	Open-cohort study to	447 FSW	FSW were divided into 6 categories: Seaters, Roamers Bar waitresses, Sellers, Cabarets and Students	Median age was 26 with a range of 15 to 56.	From October 1998 to June 2000	Bobo Dioulasso, Burkina Faso	27% were working for one year or less; 44% from 2 to 5 years; 17% from 6 to 10 years and 12 % for more than 10 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Phillipon M, Saada M, Ali Kamil M, et al. Fréquentation de un centre de santé par lès prostituées clandestines à Djibouti. Cahiers Santé. 1997; 7; 5:10.	Cross-sectional study	243 FSW	FSW that consulted during the first 4 months of 1995 at the Le Centre de Phrofilaxie	The mean age was 23.1 years (range, 15 to 37 years) and SD of 4.1.	summer of 1995	Djibouti, Ethiopia	The mean duration of prostitution was 8.4 months and the median 3 months. It ranged from 6 days to 10 years.
Africa	Ramjee G, Williams B, Gouws E, et al. The impact of incident and prevalent herpes simplex virus-2 infection on the incidence of HIV-1 infection among commercial sex workers in South Africa. J Acquir Immune Defic Syndr. 2005 Jul 1;39(3):333-9. PubMed PMID: 15980695	Multicenter vaginal microbicide phase 3 clinical trial funded by UNAIDS	187 FSW.	Sex workers from 5 truck stops.	The average age of the women was 25 years;	The year of data collection was not mentioned, but the paper was published in 2005.	5 truck stops between The port city of Durban and the commercial center of Johannesburg, South Africa	They had been doing sex work for an average of 2.5 years
Africa	Cameron DW, Ngugi EN, Ronald AR, et al. Condom Use Prevents Genital Ulcers in Women Working as Prostitutes: Influence of Human Immunodeficiency Virus Infection. Sex Transm Dis. 1991 Jul-Sep;18(3):188-91	Cross-sectional study.	378 FSW	119 with genital ulcer and 250 without it. Women who consulted at a Nairobi city commission maternal/child health care	The mean age of the women who had genital ulcer was 30 (SD: 7) and of those who did not have ulcer was 30 (SD: 6).	1987 - 1988	Pumwani, Nairobi	The mean duration of sex work of the women who had genital ulcer was 4.5 years (SD: 3) and of those who did not have ulcer wa/s 5.1 (SD: 4.1).

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Kayembe PK, Mapatano MA, Busangu AF, et al. Determinants of consistent condom use among female commercial sex workers in the Democratic Republic of Congo: implications for interventions. Sex Transm Infect. 2008 Jun;84(3):202-6. Epub 2007 Nov 30.	Cross-sectional study using time location sampling technique	2638 FSWs		Age at first paid sex: 18, ranging from 15 to 21.	January 2005 to March 2006	5 provincial capital cities of Republic Democratic of Congo	13.9 % were sex workers for less than a year; 14.3% for 1 year; 47.8% from 2 to 5 years; and 24% for 6 or more years.
Africa	Langley CL, Benga-De E, Critchlow CW, et al. HIV-1, HIV-2, human papillomavirus infection and cervical neoplasia in high-risk African women. AIDS. 1996 Apr;10(4):413-7.	Cross-sectional	759 FSWs	FSWs that attended a DST clinic. 619 HIV free; 68 HIV-1 positive; 58 HIV-2 positive; and 14 HIV 1 and 2 positive.	Mean of age was 29+-6.9 for HIV free; 32.4+-7.5 for HIV1 positive; 32.2+-8.2 for HIV2 positive; and 29.8+- 6.3 for HIV 1 and 2 positive women.	February 1990 to March 1993	Dakar, Senegal	Mean of sex work duration in years was 2.3+-3.2 for HIV free; 2.9+-4.3 for HIV1 positive; 3.2+-4.3 for HIV2 positive; and 1.3+-1.8 for HIV 1 and 2 positive women.
Africa	Mann JM, Nzilambi N, Piot P, Bosenge N, Kalala M, Francis H, Colebunders RC, Azila PK, Curran JW, Quinn TC. HIV infection and associated risk factors in female prostitutes in Kinshasa, Zaire. AIDS. 1988 Aug;2(4):249-54.	Cross-sectional	377 FSW	Women that charged specific amounts of money for brief or nightlong sexual services.	Median age was 24 ranging from 14 to 50. Mean of 3.7 sexual partners during previous week, 19.9 previous month and 158 previous year.	1985	Kinshasa, República Democrática do Congo	Median: 2 years; mean: 3.2 years; range: 2 weeks to 18 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Ngugi EN, Plummer FA, Simonsen JN, et al. Prevention of transmission of human immunodeficiency virus in Africa: effectiveness of condom promotion and health education among prostitutes. Lancet. 1988 Oct 15;2(8616):887-90.	Cohort	363 FSW	The FSW were divided in 3 groups: 91 in group 1 (enrolled in the initial cohort that received counseling); 67 in group 2 (enrolled in the initial cohort without counseling) and group 3 (enrolled afterwards).	Mean age for groups 1, 2 and 3 respectively were: 33+-5, 30+-5 and 31+-6. And the mean number of partners daily were: 3.8+-2, 3.0+-2.5 and 5.7+-3.1.	1985	Nairobi, Kenia	The mean duration of sex work in months for the 3 groups were, respectively: 45 (22.8), 35.3 (21.2) and 33.8 (26.5).
Africa	Nzila N, Laga M, Thiam MA, et al. HIV and other sexually transmitted diseases among female prostitutes in Kinshasa. AIDS. 1991 Jun;5(6):715-21.	Cross-sectional	1226 FSW	They were divided into 3 groups: 448 home-based, 693 brothel-based and 85 street-based	The mean age and mean number of partners per week were, respectively: 24.8 (5.8) and 8 (7.9) for hotel-based; 28.4 (7.9) and 8.1 (8.5) for home-based; and 21.2 (4.7) and 9.4 (8.7) for street-based.	1988/1989	Kinshasa, República Democrática do Congo	The mean duration of sex work in months were 41.9 (46) for hotel-based; 72.6 home-based; and 56.2 (108) for street-based.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Pepin J, Dunn D, Gaye I, et al. HIV-2 infection among prostitutes working in The Gambia: association with serological evidence of genital ulcer diseases and with generalized lymphadenopathy. AIDS. 1991 Jan;5(1):69-75.	Cross-sectional	346 FSWs			April 1988 to January 1989	Bnnjul, Serrakunda, Farafenni, Soma and Basse in Gambia	19.7% were sex workers for less than 12 months, 18.8% from 12 to 23 years. 14.7% from 24 to 35 years, 16.8 from 36 to 47 months and 30.1% for 48 months or more.
Africa	Anzala OA, Nagelkerke NJ, Bwayo JJ, et al. Rapid progression to disease in African sex workers with human immunodeficiency virus type 1 infection. J Infect Dis. 1995 Mar;171(3):686-9. Erratum in: J Infect Dis 1996 Jun;173(6):1529. PubMed PMID:7876618.	Cohort	160 FSWs	FSWs that were enrolled in the cohort in 1985 and 1986 and seroconverted until 1991	Mean of age was 30.9 (7.2) and mean number of sexual partners per day was 5 (4.2)	1985 to 1991	Nairobi, Kenia	Mean of 4.7 (4.9) years at seroconversion.
Africa	Kanki P, M'Boup S, Marlink R, Travers K, Hsieh CC, Gueye A, Boye C, Sankalé JL, Donnelly C, Leisenring W, et al. Prevalence and risk determinants of human immunodeficiency virus type 2 (HIV-2) and human immunodeficiency virus type 1 (HIV-1) in west African female prostitutes. Am J Epidemiol. 1992 Oct 1;136(7):895-907. PubMed PMID: 1442755.	Cohort	1275 FSWs	Registered FSWs visiting a clinic		1985	Dakar, Senegal	It is actually the amount of years as a registered prostitute, what may underestimate the sex work duration. 70.5% were sex workers for 1 to 9 years; 27.5% from 10 to 19 years; and 1.7% for 20 to 29 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Baeten JM; Richardson BA; Martin HL, et al. Trends in HIV-1 Incidence in a Cohort of Prostitutes in Kenya: Implications for HIV-1 Vaccine Efficacy Trials. J Acquir Immune Defic Syndr; 24(5):458-64, 2000 Aug 15.	Cohort	953 FSWs	Enrolled in the cohort from 1993 to 1997. 788 returned for follow up and 165 did not.	Those who returned had median of age 26, median of 1 sexual partner per week, mean of 2.2, ranging from 0 to 10, and mean of 2.2 sexual encounters per week, median of 2, ranging from 0 to 13. Those who did not return had median of age 24, mean of 1.4 sexual partner per week and mean of 1.4 sexual encounters per week.	From 1993 to 1997	Mombasa, Kenya	Among those who returned for follow-up, the median was 1.5 years ranging from 0 to 24. Among those who did not return the median was 0.75 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Kanki P, M'Boup S, Marlink R, et al. Prevalence and risk determinants of human immunodeficiency virus type 2 (HIV-2) and human immunodeficiency virus type 1 (HIV-1) in west African female prostitutes. Am J Epidemiol. 1992 Oct 1;136(7):895-907. PubMed PMID: 1442755.	Cohort	278 FSWs	Registered FSWs visiting a clinic		1987	Ziguinchor, Senegal	It is actually the amount of years as a registered prostitute, what may underestimate the sex work duration. 100% were sex workers for 1 to 9 years.
Africa	Kanki P, M'Boup S, Marlink R, et al. Prevalence and risk determinants of human immunodeficiency virus type 2 (HIV-2) and human immunodeficiency virus type 1 (HIV-1) in west African female prostitutes. Am J Epidemiol. 1992 Oct 1;136(7):895-907. PubMed PMID: 1442755.	Cohort	157 FSWs	Registered FSWs visiting a clinic		1987	Kaolack, Senegal	It is actually the amount of years as a registered prostitute, what may underestimate the sex work duration. 67.5% were sex workers for 1 to 9 years; 32.5% from 10 to 19 years.
Africa	Simonsen JN, Plummer FA, Ngugi EN, et al. HIV infection among lower socioeconomic strata prostitutes in Nairobi. AIDS. 1990 Feb;4(2):139-44. PubMed PMID: 2328096.	Cohort	418 FSWs	Living in a slum in Nairobi	Mean age was 29.2 +/- 6.5. Mean number of sex partners per day was 3.7 +/- 2.29.	1985	Nairobi, Kenya	Mean of 33.1 months +/- 47.9

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Africa	Willerford D, Bwayo JJ, Hensel M, Emonyi W, Plummer FA, Ngugi EM, Nagelkerke N, Gallatin WM, Kreiss J. Human Immunodeficiency Virus Infection among High-Risk Seronegative Prostitutes in Nairobi. JID 1993; 167 (June)	Cohort	56 FSWs	HIV-seronegative FSWs were enrolled	Mean age was 32. Average of 35 sex partners per week.	1985	Nairobi, Kenia	Mean of 6 years.
Europe	Baars JE, Boon BJ, Garretsen HF, et al. Vaccination uptake and awareness of a free hepatitis B vaccination program among female commercial sex workers. Womens Health Issues. 2009 Jan-Feb;19(1):61-9. Epub 2008 Oct 25. PubMed PMID: 18951815.	Cross-sectional study based on ethnographic mapping and targeted sampling	259 FSW	women who engage in sexual behavior for money		Between September 2004 and February 2006	3 regions in the Netherlands: Rotterdam, Utrecht, and South Limburg	Mean of 66.88 months, SD of 70.73.
Europe	Vioque J, Hernández-Aguado I, Fernandez García E, et al. Prospective cohort study of female sex workers and the risk of HIV infection in Alicante, Spain (1986-96). Sex Transm Infect. 1998 Aug;74(4):284-8.	Cohort	657 FSW	FSW that have initially attended the Centro para la Información y Prevención del SIDA and were back then HIV free and have returned to the Center between 1986 and 1996.	Mean age was 27 (IQR: 25 - 33) and range of 15 to 64.	1986 to 1996	Alicante, Spain	Median of 18 months (IQR: 4 months to 5 years) and ranged from 1 month to 35 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Europe	Ward H, Day S, Mezzone J, Dunlop L, Donegan C, Farrar S, Whitaker L, Harris JR, Miller DL. Prostitution and risk of HIV: female prostitutes in London. BMJ. 1993 Aug 7;307(6900):356-8. PubMed PMID: 8374417; PubMed Central PMCID: PMC1678221.	cross sectional survey.	280 FSW	They were recruited by referral from health workers in the genitourinary medicine clinic at St Mary's Hospital, referral from friends and colleagues of prostitutes, fieldwork (visiting streets, magistrates' courts, flats, agencies, and saunas), and telephone.	The participants were aged 16-51 (median 25);	Between April 1989 and August 1991.	London, England.	They had been working as prostitutes for between one month and 34 years (median four years)
Europe	Ward H, Day S. What happens to women who sell sex? Report of a unique occupational cohort. Sex Transm Infect. 2006 Oct;82(5):413-7. Epub 2006 Jun 21. PubMed PMID: 16790559; PubMed Central PMCID: PMC2563855.	A longitudinal study of sex workers recruited between 1986 and 1993 and followed for 15 years.	130 FSW, of the original 354 women enrolled in the cohort	Women that defined themselves as FSWs and had worked within the past 3 months.	Median of age was 27 (IQR: 23,31 and range: 16-51)	From 1997 to 2000	Clinic and community settings in London.	The majority (73/124,59%) were still in the sex industry and had sold sex for a mean of 13.6 years. In months the median was 36 (IQR: 15,72 and range: 1-216).

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Europe	Bratòs MA, Eiros JM, Orduña A, Cuervo M, Ortiz de Lejarazu R, Almaraz A, Martín-Rodríguez JF, Gutiérrez-Rodríguez MP, Orduña Prieto E, Rodríguez-Torres A.. Influence of Syphilis in Hepatitis B Transmission in a Cohort of Female Prostitutes. Sex Transm Dis. 1993 Sep-Oct;20(5):257-61.	Cross-sectional study.	368 FSW	FSW that went to a public health centre for routine medical examination	FSW practiced prostitution in pubs or massage parlors and had no more than 20 sexual contacts per month.	not mentioned	?, Spain	32.6% were working for less than 2 years; 30.2% for 2 to 3 years; 18.5% for 4 to 5 years; 10.6% for 6 to 7 years; 8% for more than 7 years.
Europe	Fennema JS, van Ameijden EJ, Coutinho RA, van den Hoek AA. HIV, sexually transmitted diseases and gynecologic disorders in women: increased risk for genital herpes and warts among HIV-infected prostitutes in Amsterdam. AIDS. 1995 Sep;9(9):1071-8.	Cohort	212 FSWs	UD free-HIV women who used drugs and who exchanged sex for money, presents or goods were recruited at methadone posts.	Mean age at enrolment was 27+- 4.8.	1985 to 1992	Amsterdam, The Netherlands.	45% were working for less than 5 years; 33% for 5 to 10 years; and 22% for more than 10 years.
Europe	Orduña A, Bratos MA, Gutierrez P, Almaraz A, Eiros JM, Martín JF, Gonzalez JM, Card-Patón A, Rodríguez-Torres A. Infection by hepatitis B and C virus in non-intravenous drug using female prostitutes in Spain. European Journal of Epidemiology, Volume 8, Number 5, 656-659, DOI: 10.1007/BF00145380	Cross-sectional	227 FSWs	Non-IDU and that had more than 20 partners per month.			Spain	38.7% were working for less than 2 years; 31.3% for 2 to 3 years; 12.8% for 4 to 5 years; 9.3% for 6 to 7 years; 7.9% for more than 7 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Europe	Papaevangelou G, Roumeliotou A, Kallinikos G, Papoutsakis G, Trichopoulou E, Stefanou T. Education in Preventing HIV Infection in Greek Registered Prostitutes. J Acquir Immune Defic Syndr. 1988;1(4):386-9.	Cohort	902 FSWs	They were divided in 3 different cohorts. 350 followed from 1985 to 1986, 270 followed from 1986 to 1987 and 282 followed from 1987 to 1988	The overall median age was 38.6 years ranging from 18 to 48. The cohort from 1985 was in median 38.4 years old and reported 1140 sex contacts per month. The cohort from 1986 was 37.8 years old (median) and reported 960 sexual contacts per month.	1985 to 1988	Athens, Greece	Overall, the median was 12 years, ranging from 1 to 30. The cohort started in 1985 reported a median of 13 years and the one started in 1986 showed a median of 8 years of prostitution. No information available for the 1987 cohort.
Europe	Pineda JA, Aguado I, Rivero A, Vergara A, Hernández-Quero J, Luque F, Pino R, Abad MA, Santos J, Cruz E, et al. HIV-1 infection among non-intravenous drug user female prostitutes in Spain. No evidence of evolution to Pattern II. AIDS. 1992 Nov;6(11):1365-9.	Cross-sectional	519 FSWs	Non-IDU FSWs that attended 4 University Hospitals and that had been working for at least 2 months.	Mean age was 30+-7. Average of 59+-84 different sex partners per month, ranging from 1 to 6000.	From May 1989 to December 1990	Andaluzia, Spain	Mean of 50 month +-60, ranging from 2 to 420

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Europe	Pineda JA, Rivero A, Rey C, Hernández-Quero J, Vergara A, Muñoz J, Aguado I, Santos J, Torronteras R, Gallardo JA, <i>et al.</i> Association between hepatitis C virus seroreactivity and HIV infection in non-intravenous drug abusing prostitutes. European Journal of Clinical Microbiology & Infectious Diseases, 1995, Volume 14, Number 5, 460-464, DOI: 10.1007/BF02114907	Cross-sectional	294 FSWs	Non-IDU, non-transfused FSWs that had been working for at least 21 month and only in brothels or nightclubs.		1990	Andaluzia, Spain	Overall, 45% were working for 24 months or less and 55% for more than 24 months. The mean duration among the 17 HCV positive was 58+-58 and among the 277 HCV negative was 50+-53.
Europe	Uusküla A, Fischer K, Raudne R, Kilgi H, Krylov R, Salminen M, Brummer-Korvenkontio H, St Lawrence J, Aral S. A study on HIV and hepatitis C virus among commercial sex workers in Tallinn. Sex Transm Infect. 2008 Jun;84(3):189-91. Epub 2008 Feb 6. PubMed PMID: 18256109.	Cross sectional study using a multistage approach combining time-location, community and respondent driven-sampling	227 FSWs	Women that had exchange sex for money, drugs or goods within the past 3 months.	Mean age was 29.5 (9.1). Mean number of clients per week was 7, median was 11, ranging from 0 to 100.	October 2005 to May 2006	Tallim, Estonia	Mean: 8.3 years, median was 6.2 and range was 0 to 30.
Europe	Gutierrez P, Orduña A, Bratos MA, Eiros JM, Gonzalez JM, Almaraz A, Caro-Patón A, Rodríguez-Torres A. Prevalence of anti-hepatitis C virus antibodies in positive FTA-ABS non-drug abusing female prostitutes in Spain. Sex Transm Dis. 1992 Jan-Feb;19(1):39-40.	Cross-sectional - same database as Orduna	227 FSWs	Non-IDU and that had more than 20 partners per month.			Spain	38.7% were working for less than 2 years; 31.3% for 2 to 3 years; 12.8% for 4 to 5 years; 9.3% for 6 to 7 years; 7.9% for more than 7 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Europe	McKeganey N, Barnard M. Selling sex: female street prostitution and HIV risk behaviour in Glasgow. AIDS Care. 1992;4(4):395-407. PubMed PMID: 1493147.	Cross-sectional study using time-sampling technique	68 FSWs	Street-based FSWs in the main red light area	Median of age was 24, ranging from 16 to 51. Average of 7.1 clients per week.	1991	Glasgow, Scotland	Median of 2 years, ranging from 2 weeks to 30 years.
Latin America	Loza O, Patterson TL, Rusch M, Martínez GA, Lozada R, Staines-Orozco H, Magis-Rodríguez C, Strathdee SA; Proyecto Mujer Segura. Drug-related behaviors independently associated with syphilis infection among female sex workers in two Mexico-US border cities. Addiction. 2010 Aug;105(8):1448-56. Epub 2010 Apr 27. PubMed PMID: 20456292.	Cross sectional behavioral intervention study	914 FSW	Participants were women, at least 18 years old, without known HIV infection, who self-identified as a FSW (i.e. traded sex for drugs, money or other material benefit), and reported unprotected vaginal or anal sex with a client at least once during the previous 4 weeks	Median age was 32 (IQR: 26 - 39) and age entered at sex work, 26	2004 to 2006	Tijuana (n = 474) and Ciudad Juarez (n = 450)	Median duration of sex work was 4 years (IQR:2 -10)

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Latin America	Strathdee SA, Lozada R, Semple SJ, Orozovich P, Pu M, Staines-Orozco H, Fraga-Vallejo M, Amaro H, Delatorre A, Magis-Rodríguez C, Patterson TL. Characteristics of female sex workers with US clients in two Mexico-US border cities. Sex Transm Dis. 2008 Mar;35(3):263-8. PubMed PMID: 18032996; PubMed Central PMCID: PMC2737364.	Behavioral intervention study that aimed to increase condom use	Same results and database of Loza 2010	at least 18 years of age, providing informed consent, and having traded sex for drugs, money, or other material benefit within the previous 2 months. Since this was an intervention study, women were also required to have had unprotected vaginal sex with at least 1 client in the past 2 months, and were excluded if they reported that they had previously tested HIV positive	Same results and database of Loza 2010	Between January 2004 and March 2005	Tijuana and Cd. Juarez, Mexico	The median number of years spent as a sex worker was 4 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Latin America	Strathdee SA, Philbin MM, Semple SJ, Pu M, Orozovich P, Martinez G, Lozada R, Fraga M, de la Torre A, Staines H, Magis-Rodríguez C, Patterson TL. Correlates of injection drug use among female sex workers in two Mexico-U.S. border cities. Drug Alcohol Depend. 2008 Jan 1;92(1-3):132-40. Epub 2007 Aug 21. PubMed PMID: 17714888; PubMed Central PMCID: PMC2213538	Behavioral intervention study that aimed to increase condom use	Same results and database of Loza 2010	Eligibility requirements included being at least 18 years of age, providing informed consent, and having traded sex for drugs, money, or other material benefit within the previous 2 months. Since this was an intervention study, women were also required to have had unprotected vaginal sex with at least 1 client in the past 2 months, and were excluded if they reported that they had previously tested HIV positive	Same results and database of Loza 2010	Between January 2004 and March 2005	Tijuana and Cd. Juarez, Mexico	The median number of years spent as a sex worker was 4 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Latin America	Bucardo J, Semple SJ, Fraga-Vallejo M, Davila W, Pson TL. A qualitative exploration of female sex work. Tijuana, Mexico. ArchSexBehav 2004; 33:343–51. Lowndes CM, Alary M, Platt L. Injection drug use, commercial sex work, and the HIV/STI epidemic in the Russian Federation. SexTransmDis 2003; 30:46–8.	Qualitative interviews	25 FSW	FSWs who were recruited through the women's clinic operated by Fronteras Unidas Pro Salud, Asociacion Civil	Participants ranged in age from 20 to 40 years, with a mean age of 27.9 years. The majority of the women reported working 6 or 7 days a week. The average number of clients per day was 6.0 (range, 1–10).	Not mentioned.	Tijuana, Mexico	Participants had been performing sex work for an average of 5 years (range, 3 months–14 years).
Latin America	SZWARCWALD, C. L. Taxas de prevalência de HIV e sífilis e conhecimento, atitudes e práticas de risco relacionadas às infecções sexualmente transmissíveis no grupo das mulheres profissionais do sexo, no Brasil. Study funded by the STD, Aids and Viral Hepatitis Department.	RDS	2500			2009	10 Brazilian cities	Mean of 8.6 years (SD:0.18) and median of 5.72 years.
Latin America	Trevisol FS, Silva MV. HIV Frequency Among Female Sex Workers in Imbituba, Santa Catarina, Brazil. BJID 2005; 9 (December)	Cross-sectional study	84 FSW	More than 18 years old	Mean age was 27 (SD 5.2) ranging from 18 to 60.	December 2003 to February 2004	Imbituba, Brazil	47.6 % were working for 2.5 years or less and the rest for more than 2.5 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Latin America	Hyams KC, Phillips IA, Tejada A, Wignall FS, Roberts CR, Escamilla J. Three-Year Incidence Study of Retroviral and Viral Hepatitis Transmission in a Peruvian Prostitute Population. J Acquir Immune Defic Syndr. 1993 Dec;6(12):1353-7.	Cohort	966 FSWs	FSWs registered at a public health clinic in Callao, port city of Lima	Mean of age at enrolment: 32.2, ranging 18 to 65. Mean of 164 sexual contacts in the previous month.	1987 to 1990	Callao, Peru	The mean duration of sex work at enrolment was 6.2 years, median of 5 years, ranging from less than a year to 30 years.
Latin America	Sánchez J, Gotuzzo E, Escamilla J, Carrillo C, Moreyra L, Stamm W, Ashley R, Swenson P, Holmes KK. Sexually Transmitted Infections in Female Sex Workers: Reduced by Condom Use But Not by a Limited Periodic Examination Program. Sex Transm Dis. 1998 Feb;25(2):82-9.	Cross-sectional	400 FSWs	Attending Centro antivenereo de Lima		From October 1991 to April 1992	Lima, Peru	The mean was 41.7 months +- 48.3, ranging from 1 to 264.
Latin America	Wignall FS, Hyams KC, Phillips IA, Escamilla J, Tejada A, Li O, Lopez F, Chauca G, Sanchez S, Roberts CR. Sexual transmission of human T-lymphotropic virus type I in Peruvian prostitutes. J Med Virol. 1992 Sep;38(1):44-8.	Cross-sectional	467 FSWs	395 FSWs from Calao and 72 from Iquitos. Attended a public SDT clinic.	Mean of age: 33.8+-8.2, ranging from 18 to 60. Mean number of sexual contacts in the previous month was 205.	July 1987 to May 1988	Iquitos and Callao, Peru	Mean of 8.8 years +- 6.7, ranging from 1 year to 39 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Latin America	Gotuzzo E, Sánchez J, Escamilla J, Carrillo C, Phillips IA, Moreyra L, Stamm W, Ashley R, Roggen EL, Kreiss J, et al. Human T cell lymphotropic virus type I infection among female sex workers in Peru. J Infect Dis. 1994 Apr;169(4):754-9. PubMed PMID: 8133088.	Cross-sectional	396 FSWs	Women who attended Centro Antivenereo of Lima. 284 registered for follow up and the rest not registered.	Mean age of 28.8+- 6.4, ranging from 18 to 48.	October 1991 to April 1992	Lima, Peru	56.8% were sex workers for more less than 3 years; 27.3% for 3 to 6 years; and 15.9% for more than 6 years.
Latin America	Paris M, Gotuzzo E, Goyzueta G, Aramburu J, Caceres CF, Castellano T, Jordan NN, Vermund SH, Hook EW 3rd. Prevalence of gonococcal and chlamydial infections in commercial sex workers in a Peruvian Amazon city. Sex Transm Dis. 1999 Feb;26(2):103-7. PubMed PMID: 10029985. 560: Klausner JD,	Cross-sectional study, using convenience sample	100 FSW	Street and brothel commercial sex workers	The mean age of participants was 30.3 (range 15-57) years.	Not mentioned	Loreto Province, Peru	72% were sex workers for 5 years or less.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
North America	Potterat JJ, Woodhouse DE, Muth JB, Muth SQ. Estimating the prevalence and career longevity of prostitute women The Journal of Sex Research Vol. 27, No. 2 (May, 1990), pp. 233-243	Cohort - continuous surveillance of prostitute population.	361 long-term residents FSW	Women who exchange sexual activity for payment. Women known by a health department to have engaged in prostitution	Mean age at first visit was 22.7 (SD: 4.66) and median of 22.	1970 to 1988	Colorado Springs, USA	Mean of 5 years and median of 4. The measure was the interval between the first and last clinic visit.
North America	Seidlin M, Krasinski K, Bebenroth D, Itri V, Paolino AM, Valentine F. Prevalence of HIV infection in New York call girls. J Acquir Immune Defic Syndr. 1988;1(2):150-4. PubMed PMID: 3216302.	Cross sectional study.	78 FSW	Women that have been performing sexual services for money but had never solicited clients on the streets.	Mean age was 31.6 (range 18 to 58). 83% were caucasian.	From January 1986 to December 1987.	New York, USA	5.1 years (range: 0.4 to 18 years)
North America	Casabona J, Sánchez E, Salinas R, Lacasa C, Verani P. Seroprevalence and risk factors for HIV transmission among female prostitutes: A community survey. European Journal of Epidemiology. 1990; 6(3); 248-52.	Community survey	71 FSWs.		Mean age: 29 +- 7.42. Mean age of initiation: 23.41+- 5.84. Mean number of clients per week: 27+- 15.72.	Not mentioned	3 cities in Southern California, USA	The mean duration of prostitution was 77.05 months +- 66.26 and the media was 61.33.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Cambodia Ministry of Health 1997	BSS	245 DFSW	Brothel based	Mean age was 21.9 years. Mean of 3.5 clients and of 3.6 sexual acts on the last day.	1997	In 2 provinces of Cambodia: Phnom Penh and Siem Reap	Mean time of sex work was 1.4 years and median less than a year.
Asia	Cambodia Ministry of Health 1998	BSS	804 DFSWs	Brothel based	Mean age was 21.5 years. Mean number of clients on the last day was 3.0 and median 2.0.	1998	In 5 provinces of Cambodia: Phnom Penh, Kampong Cham, Battambang, Siem Reap and Sihanouk Ville	Mean time of sex work was 1.0 years and median less than a year.
Asia	Cambodia Ministry of Health 1999	BSS	792 DFSWs	Brothel based	Mean age was 21.6 years. Mean number of clients on the last day was 2.5 and median 2.0.	1999	In 5 provinces of Cambodia: Phnom Penh, Kampong Cham, Battambang, Siem Reap and Sihanouk Ville	Mean time of sex work was 1.2 years and median less than a year.
Asia	Cambodia Ministry of Health 2001	BSS	570 DFSWs	Brothel-based	Mean age of 22.3 years. Median of 2 clients on the last day and mean of 3.1 clients on the last day.	December 2001 and January 2002	In 5 provinces of Cambodia: Phnom Penh, Kampong Cham, Battambang, Siem Reap and Sihanouk Ville	The median number of months working at a brothel was 112 and the mean 9.1.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Cambodia Ministry of Health 2003	BSS	1308 DFSWs	Brothel based sex workers	The DFSWs were 15 to 45 years old, and their mean age was 23.3 years (median=22). DFSW reported up to 25 clients in the last working day, but 22% had no client and 18% had 5 clients or more. All together their mean number of clients in the past day was 2.6 (median=2). The mean number of sexual intercourse in the last working day was comparable to the number of clients in the same period.	2003	In 10 cities in Cambodia: Phnom Penh, Battambang, Siem Reap, Sihanoukville, and Kampong Cham, Pursat, Koh Kong, Kratie, Takeo, and Kampot.	50% of the DFSWs sold sex for the first time during the past year, while for 19% first paid sex occurred 5 to 20 years ago. The mean duration of selling sex, 21.3 months and the median 12 months.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Cambodia Ministry of Health 2003	BSS	1252 IFSWs	600 beer promoters and 474 karaoke workers	Beer promoters were older than karaoke workers (mean age 25 versus 22)	2003	In 10 cities in Cambodia: Phnom Penh, Battambang, Siem Reap, Sihanoukville, and Kampong Cham, Pursat, Koh Kong, Kratie, Takeo, and Kampot.	Karaoke workers reported having been in their current job for a shorter period than beer promoters (mean of 7.1 versus 14.1 months, and median of 4 versus 6 months, respectively), suggesting a higher turnover among karaoke workers. With a median number of months in the current job below 1 year.
Asia	Cambodia Ministry of Health 2007	BSS	592 DFSWs	Women, aged at least 15 years old, brothel-based and currently employed and present at the moment of the interview.	They had a mean age of 25.2 years. The mean number of clients in the last working day was 4.4. The majority of DFSWs had 2 to 5 clients in the previous day and about 80 clients in the past month.	2007	In 5 provinces of Cambodia: Phnom Penh, Kampong Cham, Battambang, Siem Reap and Sihanouk Ville	The median number of months in their current job was 12

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Cambodia Ministry of Health 2007	BSS	1093 IDFSWs	395 beer promoters, 399 karaoke workers and 299 beer garden staff, Women, aged at least 15 years old, brothels-based and currently employed and present at the moment of the interview.	The beer promoters were the oldest with a mean age of 25.5 years (median 25 years), Karaoke workers and beer garden workers were similar of similar age with means of 22.9 years and 21.8 years respectively (median 22 years and 21 years).	2007	In 5 provinces of Cambodia: Phnom Penh, Kampong Cham, Battambang, Siem Reap and Sihanouk Ville	The median number of months in their current establishment was 5 for beer garden workers, 12 for beer promoters and 6 for karaoke workers.
Asia	Celentano DD, Akarasewi P, Sussman L, Suprasert S, Matanasarawoot A, Wright NH, Theetranont C, Nelson KE. HIV-1 infection among lower class commercial sex workers in Chiang Mai, Thailand. AIDS. 1994 Apr;8(4):533-7. PubMed PMID: 8011259.	A cross-sectional study.	273 FSW	FSW that worked in 7 brothels, 2 restaurants, a bar and a motel.	54% were 21 years old or older.	May and June 1992	Chiang Mai, Thailand	29.7% were sex workers for 1 to 12 months; 23.1% for 13 to 24 months; 24.9% for 25 to 48 months; and 22.3% for 49 to 192 months. The mean duration of employment was less than 3 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Gu J, Lau JT, Chen X, et al. Using the Theory of Planned Behavior to investigate condom use behaviors among female injecting drug users who are also sex workers in China. AIDS Care. 2009 Aug;21(8):967-75. PubMed PMID: 20024752.	Snowball sampling process	216 IDUFSWs	Non-institutionalised female IDUs, who were of age 18 years old or above, and whom mainly used heroin for injection and had engaged in sex work (trade sex for money or drugs) in the past 6 months,	The participants were on average 26.1 years old	August 2005 through April, 2006	Whilst Dazhou, Sichuan Province, China	About half (50.5%) of the respondents had involved in commercial sex work for 3 years or more.
Asia	Kao JH, Chen W, Chen PJet al. GB virus-C/hepatitis G virus infection in prostitutes: possible role of sexual transmission. J Med Virol. 1997 Aug;52(4):381-4. PubMed PMID: 9260684.	Cross-sectional study	145 FSW	HIV negative licensed female sex workers who received mandatory routine health check-ups in the Municipal Veneral Disease Control Institute. They were asymptomatic for liver disease on enrollment, and none admitted a history of intravenous drug abuse.	Mean age, 35 ± 10 years; range, 20–65 years.	Not mentioned	Taiwan	Mean of duration of sex work was 6.5±3.6 years among anti-HCV-positive prostitutes and 4.5±2.8years for the seronegatives.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Lau JT, Zhang J, Zhang L, Wang N, Cheng F, Zhang Y, Gu J, Tsui HY, Lan Y. Comparing prevalence of condom use among 15,379 female sex workers injecting or not injecting drugs in China. Sex Transm Dis. 2007 Nov;34(11):908-16. PubMed PMID: 18049424.	BSS	15379 FSW were interviewed and 15277 provided information on duration of sex work		26% were 20 years old or less	2002 to 2004	Sichuan, China	< 1 year: 4437 (29%), 1 year: 4929 (32.3%), 2 to 3 years: 4065 (26.6%), >=4 years:1846 (12.1%)
Asia	Majid N, Bollen L, Morineau G, Daily SF, Mustikawati DE, Agus N, Anartati AS, Natpratan C, Magnani R. Syphilis among female sex workers in Indonesia: need and opportunity for intervention. Sex Transm Infect. 2010 Jun 3. .	behaviouralsurvey	A total of 4324 FSW, 2436 direct and 1888 indirect.	Direct (ie, brothel-based and street-based FSWs) and indirect (ie, women working in entertainment places such as massage parlors, karaoke clubs, discotheques and bars) FSW	Median age was 27 y (range (15 - 59)	From August through October 2007	10 major cities in Indonesia	Median of 18 months (range: 1- 328).

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Mishra S, Moses S, Hanumaiah PK, et al. Sex work, Syphilis, and Seeking Treatment: An Opportunity for Intervention in HIV Prevention Programming in Karnataka, South India. Sex Transm Dis. 2009 Feb 9. [Epub ahead of print] PubMed PMID: 19174734.	Cross-sectional IBBA surveys of urban FSWs in 5 districts of Karnataka	2208 FSW		54.8% were 30 years of age or more.	2004 to 2006	5 districts of Karnataka, India	61.3% of the FSWs reported duration of sex work ≥ 3 years
Asia	Nhurod P, Bollen LJ, Smutrapapoot P, et al. Access to HIV testing for sex workers in Bangkok, Thailand: a high prevalence of HIV among street-based sex workers. Southeast Asian J Trop Med Public Health. 2010 Jan;41(1):153-62. PubMed PMID: 20578494	Cross sectional study	The total sample of the study was 603 women, but only 355 were FSW. 83 street based FSW and 236 other sex workers.	FSW attending three public sexually transmitted infection (STI) clinics.	Median of age was 36 (IQR: 27 - 48) for street based FSW and 26 (IQR: 21 - 33) for other sex workers. The median of age of initiation was 26 (range: 11-57) for street based FSW and 24 (range: 13-50) for other FSW.	From May 2004 to June 2006	Bangkok, Thailand	Median of 5 (range: 0-30) for street based FSW and 0 (range: 0-20) for others.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Ohshige K, Morio S, Mizushima S, et al. Cross-sectional study on risk factors of HIV among female commercial sex workers in Cambodia. Epidemiol Infect. 2000 Feb;124(1):143-52. PubMed PMID: 10722142; PubMed Central PMCID: PMC2810895.	A cross-sectional study on sexual behaviour and serological prevalence	202 FSW	Brothel based FSWs.	The mean age of the 202 CSWs was 20±3 years old (standard deviation: 3±0, youngest: 15, oldest: 33)	Not mentioned	Sisophon and Poi Pet in Cambodia	61.9% were in sex work for less than a year; 23.8% from a year to less than 2 years; and 14.4 for 2 or more years.
Asia	Ohshige K, Morio S, Mizushima S, et al. Behavioural and serological human immunodeficiency virus risk factors among female commercial sex workers in Cambodia. Int J Epidemiol. 2000 Apr;29(2):344-54. PubMed PMID: 10817135.	Cross-sectional study	143 direct CSW and 94 indirect CSW.	DCSW from 20 brothels in Sisophon. IDCWS employed in hotels, nightclubs and restaurants.	The mean ages of DCSW and ICSW were 20.3 (SD: 3.1) and 22 years old (SD: 5.4).	From December 1997 to January 1998	Sisophon, Cambodia	62.2% of DCSW reported less than a year of sex work. This number is 30.9% for IDCWS. (49.7% for all of them)

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Reza-Paul S, Beattie T, Syed HU, Venukumar KT, et al. Declines in risk behaviour and sexually transmitted infection prevalence following a community-led HIV preventive intervention among female sex workers in Mysore, India. AIDS. 2008 Dec;22 Suppl 5:S91-100.	IBBA with a variation of the time-location cluster (TLC) sampling	429 FSW, in 2004 and 425 FSW in 2006.		Both groups with median age 30 years old. the median age women started selling sex was 25 years in both surveys	2004 and 2006	Mysore, India	women reported working as sex workers for a median of 3 years at baseline (range 0–38; IQR 1, 5), and 5 years at follow-up (range 0–30; IQR 2, 10. For both surveys the median duration in sex work was 4 years
Asia	Ruan Y, Cao X, Qian HZ, et al Syphilis among female sex workers in southwestern China: potential for HIV transmission. Sex Transm Dis. 2006 Dec;33(12):719-23.	Cross-sectional study	343 FSW	1)female;2) self-report of commercial sex in the past 6 months; 3)will stay in Xichang for the next 12 months; 4)able and willing to provide informed consent; 5) able and willing to provide contact information for follow-up.	The median age of initiating sex work was 21 years, ranging from 15 to 34 years.	From December 2004 to January 2005	Xichang City, Sichuan Province, China	The median duration of sex work was 1 year.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Rugpao S, Pruithithada N, Yutabootr Y, et al. Condom breakage during commercial sex in Chiang Mai, Thailand. Contraception. 1993 Dec;48(6):537-47. PubMed PMID: 8131395.	A cross-sectional study.	326 FSW	Brothel based FSWs. Only brothels that had more than 5 FSW.	The mean age of 326 prostitutes interviewed was 20.6 t 3.2 years. Average clients per day reported in the past 24 hours and in the past 3 months were consistent, i.e., 4.4 t 2.5 and 5.5 2 2.2, respectively.	From August to October 1992.	Muang District, Chiang Mai city, Thailand	Duration of prostitution ranged from 10 days to approximately 14 years (median = 13 months).
Asia	Sarkar K, Bal B, Mukherjee R, et al. Young age is a risk factor for HIV among female sex workers--an experience from India. J Infect. 2006 Oct;53(4):255-9. Epub 2005 Dec 27. PubMed PMID: 16386307.	A cross-sectional community-based study	2076 FSW	Brothel-based sex workers	Most subjects were in the 31 to 40 year age group (56.8%), followed by the 21 to 30-year group (28.7%).	Not mentioned, but paper was published in 2006	West Bengal, eastern India	Occupational duration varied from less than 1 year(18%) to more than 5 years (49%). 388 (70.6%) reported been on sex work for 3 years or more.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Sarkar K, Bhattacharya S, Bhattacharyya S, et al. Oncogenic human papilloma virus and cervical pre-cancerous lesions in brothel-based sex workers in India. J Infect Public Health. 2008;1(2):121-8. Epub 2008 Nov 12. PubMed PMID: 20701853.	Community-based cross-sectional study	229 FSW	Brothel-based sex workers	The mean age of sex workers was 30. 118 FSW were <= 20 years old at initiation.	Does not mention the year of data collection. But it was published in 2008.	3 district brothels (Kolkata, North 24-Parganas and Burdwan) of West Bengal, India	38 FSW have been working for 0 to 1 year; 85 for 2 to 5 years, 45 for 6 to 10 years and 58 for 11 to 40 years.
Asia	Sawayama Y, Hayashi J, Etoh Y, Urabe H, Minami K, Kashiwagi S. Heterosexual Transmission of GB Virus C/Hepatitis G Virus Infection to Non-Intravenous Drug-Using Female Prostitutes in Fukuoka, Japan. Dig Dis Sci. 1999 Oct;44(10):1937-43.	Cross-sectional survey	134 FSW	Non- UDI FSW who attended 2 dermatology clinics in Fukuoka	Mean age was 27.2, SD 5.9 and range: 17 to 47.	January 1993 to June 1996.	Fukuoka, Japan	37.3% were sex workers for less than 2 years; 47% for 2 to 4 years and 27.7% for 5 or more years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Silverman JG, Decker MR, Gupta J, Maheshwari A, Patel V, Raj A. HIV prevalence and predictors among rescued sex-trafficked women and girls in Mumbai, India. J Acquir Immune Defic Syndr. 2006 Dec 15;43(5):588-93. PubMed PMID: 17019369.	Case records and medical documentation of residents at a major nongovernmental organization (NGO) providing rescue, shelter, and care of minor girls and women held against their will in brothels in Mumbai were reviewed.	175	Girls and women trafficked into sex work and that had HIV laboratory test results.	Age at trafficking ranged from 8 to 29 years (mean = 16.8 years)	Between December 2002 and July 2005	Mumbai, India	The mean time served in brothels at rescue was 15.8 months, with more than two thirds (69.3%) serving in brothels for 1 year or less and 40.9% reporting brothel confinement for <6 months
Asia	Silverman JG, Decker MR, Gupta J, Maheshwari A, Willis BM, Raj A. HIV prevalence and predictors of infection in sex-trafficked Nepalese girls and women. JAMA. 2007 Aug 1;298(5):536-42. PubMed PMID: 17666674.	Medical documentation and case record materials for all survivors of sex trafficking presenting to Maiti Nepal (Kathmandu, Nepal) were collected by the investigative team in January 2006.	287	Repatriated girls and women reporting being trafficked from Nepal for sexual exploitation and receiving rehabilitative services	Median age at time of trafficking was 17 years (7 to 32). FORCED PROSTITUTION	Between January 1997 and December 2005	Kathmandu, Nepal	The mean time served in brothels was 25.8 Months (median, 12.0 months)

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Sopheab H, Gorbach PM, Gloyd S, Leng HB. Rural sex work in Cambodia: work characteristics, risk behaviours, HIV, and syphilis. Sex Transm Infect. 2003 Aug;79(4):e2. PubMed PMID: 12902610; PubMed Central PMCID: PMC1744694.	Cross-sectional study. Census.	71 FSWs.	FSWs in provincial sex establishments (23 brothels and six karaokê bars in three districts)	Mean age was 25 years.	2000	Rural Cambodia, in Kampong Chhnang province	Mean of 2 years.
Asia	Sopheab H, Morineau G, Neal J J, et al. Sustained high prevalence of sexually transmitted infections among female sex workers in Cambodia: high turnover seriously challenges the 100% condom use programme. BMC Infectious Diseases 2008, 8:167.	Data from Cambodia's national SSS 2005	1079 FSW	Women mainly working at the brothels in the red light areas who have no other employment other than selling sex to clients. All women working in selected establishments and not menstruating at time of interview were eligible.	Most of them were young (55% aged 15–24) and new to sex work (60% had worked 12 ≤ months)	From March to May 2005	8 capital cities of the following provinces of Cambodia: Phnom Penh, Kampong Cham, Prey Veng, Battambang, Banteay Meanchey, Siem Reap, Koh Kong, and Sihanouk Ville.	The duration of sex work ranged from 1 month to 12 years, and 60% were "new FSWs" (having sold sex for 12 months or less).

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Taneepanichskul S, Phuapradit W, Chaturachinda K. Association of contraceptives and HIV-1 infection in Thai female commercial sex workers. Aust N Z J Obstet Gynaecol. 1997 Feb;37(1):86-8. PubMed PMID: 9075554.	Case-control study to evaluate the association between contraceptive methods and HIV infection	376 FSW	118 cases of HIV-I infected sex workers were eligible for inclusion and 258 HIV-I negative women were recruited as controls	The mean age for cases was 22.8 +- 4.1 and for controls: 23.7+- 4.2.	October 1, 1993 to December 31, 1994	Khon Kaen and Lumpang provinces, Thailand	4.2% of cases were in sex work for less than a year, 31.4% from 1 to 2 years, 27.1% from 3 to 4 years and 37.3 for 5 or more years. 11.5% of controls were in sex work for less than a year, 31% from 1 to 2 years, 23.3% from 3 to 4 years and 34.1 for 5 or more years.
Asia	Theng TS, Sen PR, Tan HH, et al. Seroprevalence of HSV-1 and 2 among sex workers attending a sexually transmitted infection clinic in Singapore. Int J STD AIDS. 2006 Jun;17(6):395-9.	Cross-sectiona study.	300. 297 FSW and 3 male transvestite	Brothel-based sex workers attending a sexually transmitted infection clinic in Singapore	The mean age of the sex worker was 38.4 years (range 22–70 years).	Between October 2003 and March 2004	Singapore	32.3% were working for less than 5 years; 28% from 5 to 9 years; and, 39.7% for 10 years and more.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Thuy NT, Nhung VT, Thuc NV, Lien TX, Khiem HB. HIV infection and risk factors among female sex workers in southern Vietnam. AIDS. 1998 Mar 5;12(4):425-32.	Cross-sectional study	968 FSW	newly enrolled female CSW in education centers.	Mean age was 26 (SD 7.6) ranged 12 to 60.	August 1995 to October 1996	Ho Chi Minh City, Na Giang and Can Tho in Vietnam	Mean of 20 months (SD 26.4 months) ranging from 1 to 120 months.
Asia	Todd CS, Nasir A, Stanekzai MR, Bautista CT, Botros BA, Scott PT, Strathdee SA, Tjaden J. HIV, hepatitis B, and hepatitis C prevalence and associated risk behaviors among female sex workers in three Afghan cities. AIDS. 2010 Jul;24 Suppl 2:S69-75. PubMed PMID: 20610952.	Cross sectional study	520 FSW	Participants were those reported having sex work within the past 6 months, aged 18 years or greater, and able to provide informed consent.	Mean of age initiating sex work was 23.3 (SD: 5.1) years old	Between September 2006 and January 2008	FSWs from Jalalabad, Kabul and Mazar-i-Sharif in Afghanistan	Median of 5 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Tran TN, Detels R, Long HT, Van Phung L, Lan HP. HIV infection and risk characteristics among female sex workers in Hanoi, Vietnam. J Acquir Immune Defic Syndr. 2005 Aug 15;39(5):581-6. PubMed PMID: 16044011; PubMed Central PMCID: PMC2908502	Cross-sectional survey using 2-stage cluster sampling	400 FSW	FSW in Hanoi who had traded sexual intercourse for money or gifts within the past 30 days.	The mean and median ages of subjects were 30.4 and 28.5 years, respectively, with age ranging from 16–56 years. The mean and median ages at first sexual experience were both 19 years (range 12–33).	From June to September 2002	Hanoi, Vietnam	The median duration in sex work was 2.3 years and ranged from 1 month to 21 years.
Asia	van den Hoek A, Yuliang F, Dukers NH, Zhiheng C, Jiangting F, Lina Z, Xiuxing Z. High prevalence of syphilis and other sexually transmitted diseases among sex workers in China: potential for fast spread of HIV. AIDS. 2001 Apr 13;15(6):753-9. PubMed PMID: 11371690.	Cross-sectional study	966 FSW	Sex workers outside detention who attended a program in order to promote STD/HIV knowledge and condom use, and to study the occurrence of STD.	The mean age of the women was 25 years.	From March 1998 to mid-October 1999	Guangzhou in South-east China	The median duration of prostitution was one year,

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Wang BO, Xiaoming LI, Stanton B, Yang H, Fang X, Zhao R, Dong B, Zhou Y, Liu W, Liang S. Vaginal Douching, Condom Use, and Sexually Transmitted Infections Among Chinese Female Sex Workers. Sex Transm Dis. 2005 November ; 32(11): 696–702.	Cross-sectional study	454 FSW	recruited from restaurants, barbershops, and hair-washing, rooms in 3 geographic locations in H County	Mean age was 23.5 (SD: 5.1). Mean number of clients was 2 per week.	2004	Nanning, China	Mean of 12.2 months.
Asia	Wang H, Chen RY, Ding G, Ma Y, Ma J, Jiao JH, Wu Z, Sharp GB, Wang N. Prevalence and predictors of HIV infection among female sex workers in Kaiyuan City, Yunnan Province, China. Int J Infect Dis. 2009 Mar;13(2):162-9. Epub 2008 Aug 20.	Cross-sectional study	737 FSW	Women ≥16 years old, self-reported to have sold sex for money within the previous three months		March-May 2006	Kaiyuan City, Yunnan Province, China	the median duration of sex work was 19.4 months (IQR: 8.1–40.5 months). The median duration of sex work was 46 months for HIV-positive subjects and 18.5 months for those who were HIV-negative. < 1 year: 33.8%; 1 to 2 years: 38.4%; 3 to 4 years: 13.2%; 5 years and more: 14.7%.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Wong ML, Chan RK, Koh D, et al. A prospective study on condom slippage and breakage among female brothel-based sex workers in Singapore. Sex Transm Dis.2000;27(4):208-14.	A prospective study on condom breakage and slippage over a 1-day period	219 FSW	brothel-based sex workers attending health-education workshops on condom use and condom negotiation skills at the Department of STD control	Ages ranged from 21 to 49 years with a mean of 25.2 years and median of 24.	From May to December 1997	Singapore	The median duration of sex work was 2 months (range, 1 to 42 months)
Asia	Thuong NV, Nhung VT, Nghia KV, et al. HIV in five border provinces of Vietnam. Sex Transm Infect. 2005; 81: 477–479.	Cross-sectional study.	911 FSWs			Between December 2002 and February 2003	Five border provinces of Vietnam (Lai Chau, QuangTri, DongThap, AnGiang, and KienGiang)	19.7% were working for 6 months or less
Asia	Tran TT, Le CL, Nguyen TL. Factors Associated With Inconsistent Condom Use Among Female Sex Workers in Nha Trang, Vietnam. Asia Pac J Public Health. 2008;20(4):370-8.	Cross-sectional with sampling by snowball	192 FSWs		Age: mean of 28.3, median of 27 and ranged from 17 to 56. Number of clients per week: mean of 7.7, ranging from 0 to 20.	2005	Nha Trang, Vietnam	Mean of 5.4 years, median of 5 and range from 1 month to 22 years.

Region	Reference	Methodology	Sample size	Sample definition	Sample characteristics	Year of data collection	Location	Duration of sex work
Asia	Nakashima K, Kashiwagi S, Hayashi J, et al. Sexual Transmission of Hepatitis C Virus among Female Prostitutes and Patients with Sexually Transmitted Diseases in Fukuoka, Kyushu, Japan. Am J Epidemiol. 1992;1;136(9):1132-7.	Cross-sectional	282 FSWs			1989	Fukuoka, Japan	74.1% were sex workers for 1 year or more.
Asia	Simoes EA, Babu PG, Jeyakumari HM, John TJ. The Initial Detection of Human Immunodeficiency Virus 1 and Its Subsequent Spread in Prostitutes in Tamil Nadu, India. J Acquir Immune Defic Syndr. 1993 Sep;6(9):1030-4.	Cross-sectional	412 FSWs	Incarcerated for performing physical sexual acts with men for money	Mean age of 24 years, ranging 18 to 54.	1986	6 major cities in India: Tiruchirapally, Vellore, Madras, Madurai, Coimbatore and Salem.	8.3% were sex workers for less than a year; 22.3% from 2 to 2.9 years; 18.9 from 3 to 3.9 years; 15.8 from 4 to 4.9 years; and 34,7 for 5 or more years.

Table S2. Data extracted from studies conducted in the Injected Drug Users population

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Asia	Buavirat A, Page-Shafer K, van Griensven GJ, Mandel JS, Evans J, Chuaratanaphong J, Chiamwongpat S, Sacks R, Moss A. Risk of prevalent HIV infection associated with incarceration among injecting drug users in Bangkok, Thailand: case-control study. BMJ. 2003 Feb 8;326(7384):308.	Case-control	347 (175 cases and 172 controls)	IDU who had been incarcerated for at least six months during the previous five years. Case: HIV positive injecting drug user with a medical record documenting a negative HIV test within the five years before the most recent incarceration and HIV positive serostatus since the most recent release. Control: HIV negative injecting drug users 1 at least 8 years old.	Median: 29 (IQR: 25-36) years.	From August 2000 to January 2001	Thailand	Median: for cases it was 9.2 (IQR: 7 - 13) and for controls: 8 (IQR: 6 - 13)
Asia	Go VF, Frangakis C, Nam LV, Sripaipan T, Bergenstrom A, Li F, Latkin C, Celentano DD, Quan VM. Characteristics of High-Risk HIV-Positive IDUs in Vietnam: Implications for Future Interventions. Subst Use Misuse. 2010 Aug 24	Cross-sectional	299		Median: 27 (IQR: 23-32)	Between August and September 2003	Vietnam	Median: 3 (IQR 2-6)
Asia	Kermode M, Singh LB, Raju RK, et al. Injections for health-related reasons amongst injecting drug users in New Delhi and Imphal, India. Public Health. 2006 Jul;120(7):634-40.	Cross-sectional	200 (100 in Impal and 100 in New Dheli)		Mean: overall it was 29 (SD: 7.5) for Impal IDU was 30.2 and for New Dheli, 28.9.	2004	India	Mean: overall it was 6, for the IDU in Impal, 10 and for the ones in New Dheli, 1.9. Median: for overall it was 3.5 (range: 0.04-24, SD: 6.1).

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Asia	Lee KC, Lim WW, Lee SS. High prevalence of HCV in a cohort of injectors on methadone substitution treatment. J Clin Virol. 2008 Apr;41(4):297-300. Epub 2008 Jan 10.	Cross-sectional	567	IDUs attending Methadone clinics (MCs) that were attended by at least 200 drug users per day or 40 per hour. Inclusion criteria were 1. ever injected illicit drug, 2. agreed to be interviewed and 3. to undergo venesection to produce a blood sample.	Median: 49	2006	China	Median: 17
Asia	Wright NH, Vanichseni S, Akarasewi P, et al. Was the 1988 HIV epidemic among Bangkok's injecting drug users a common source outbreak? AIDS. 1994 Apr;8(4):529-32.	Cross-sectional	1901			1988	Thailand	9.8% injected for 1 year or less
Asia	Azim T, Chowdhury EI, Reza M, et al. Prevalence of infections, HIV risk behaviors and factors associated with HIV infection among male injecting drug users attending a needle/syringe exchange program in Dhaka, Bangladesh. Subst Use Misuse. 2008 Dec;43(14):2124-44.	Cohort	561	Inclusion criteria were 1. being 15 years and older, 2. having a history of injecting drugs at least once in the last 2 months, 3. being a member of the NSEP of CARE Bangladesh and 4. not having changed the area or neighborhood, where they lived in the last 6 months	Median: 35 (IQR: 29.5–40)	2002	Bangladesh	Median: 14 (IQR: 10–20)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Asia	Bautista CT, Todd CS, Abed AM, et al. Effects of duration of injection drug use and age at first injection on HCV among IDU in Kabul, Afghanistan. J Public Health (Oxf). 2010 Sep;32(3):336-41.	Cross-sectional	459	IDUs who reported injection drug use in the last 6 months and were at least 18 years old.	Mean: 30.4 (SD: 7.7)	June 2005 to June 2006	Afghanistan	Mean: 4.2 (SD: 3.6)
Asia	Beyrer C, Patel Z, Stachowiak JA, et al. Characterization of the emerging HIV type 1 and HCV epidemics among injecting drug users in Dushanbe, Tajikistan. AIDS Res Hum Retroviruses. 2009 Sep;25(9):853-60		491	Eligible study participants 1. were 17 years of age and over, 2. had injected within the previous month, 3. were Russian and/or Tajik speaking, and 4. were able to provide informed consent.	Median: 31 (IQR: 26–39)	From May to November 2004	Tajikistan	Median: 5 (IQR: 2–9)
Asia	Niccolai LM, Verevchkin SV, Toussova OV, et al. Estimates of HIV incidence among drug users in St. Petersburg, Russia: continued growth of a rapidly expanding epidemic. Eur J Public Health. 2010 Aug 26.	Cross-sectional	691	Eligibility for inclusion in the present analysis included reporting a history of ever injecting drugs.	Median: 29 (range 18–53)	From November 2005 to December 2008	Russia	Median: 8 (range: 1–36)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Asia	Mahanta J, Medhi GK, Paranjape RS, et al. Injecting and sexual risk behaviours, sexually transmitted infections and HIV prevalence in injecting drug users in three states in India. AIDS. 2008 Dec;22 Suppl 5:S59-68.	Cross-sectional	2075 (419 in Churachandpu, 420 in Bishnupur, 440 in Phek, 420 in Wokha, 376 in Mumbai/Thane.	Inclusion criteria: 1. be a man, 2. 18 years or older, and 3. who injected addictive substances/drugs for non-medical purposes at least once in the past 6 months.		Not mentioned	India	% that injected for 1 year or less: 4.5 in Churachandpu, 27.3 in Bishnupur, 42.1 in Phek, 11.1 in Wokha, 21.3 in Mumbai/Thane.
Asia	Quan VM, Go VF, Nam le V, et al. Risks for HIV, HBV, and HCV infections among male injection drug users in northern Vietnam: a case-control study. AIDS Care. 2009 Jan;21(1):7-16.	Case-control	309	IDUs who were 18 to 45 years old and who reported having injected drugs in the prior six months were eligible for study enrollment.	Median: 27 (range: 18-45)	2003	Vietnam	Median: 3 (range: 1-18)
Asia	Lee KC, Lim WW, Lee SS. High prevalence of HCV in a cohort of injectors on methadone substitution treatment. J Clin Virol. 2008 Apr;41(4):297-300.	Cross-sectional	567	IDU attending methadone clinics that were attended by at least 200 drug users per day or 40 per hour.	Median: 49	2006	China	Median: 17

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Asia	Todd CS, Abed AM, Scott PT, et al. Correlates of receptive and distributive needle sharing among injection drug users in Kabul, Afghanistan. Am J Drug Alcohol Abuse. 2008;34(1):91-100.	Cross-sectional	464	Eligible participants reported injecting drugs within the past six months (confirmed through injection stigmata), were 18 years or greater, and were able to provide informed consent.	Mean: 30.6	Between June 2005 and June 2006	Afghanistan	Mean: 4.4 years (IQR: 2–6)
Asia	Altaf A, Shah SA, Zaidi NA, et al. High risk behaviors of injection drug users registered with harm reduction programme in Karachi, Pakistan. Harm Reduct J. 2007;10;4:7	Cross-sectional	161	Registered IDUs of a needle exchange and harm reduction programme.	Mean: 35.9 (range: 18–63)	2003	Pakistan.	Tmean: 4.4
Asia	Azim T, Chowdhury EI, Reza M, et al. Vulnerability to HIV infection among sex worker and non-sex worker female injecting drug users in Dhaka, Bangladesh: evidence from the baseline survey of a cohort study. Harm Reduct J. 2006 Nov 17;3:33	Cohort	130, 82 FSW and 48 non-FSW	All women 15 years and older with a history of injecting drugs at least once in the last six months were eligible for enrolment.	Median: for IDU sex workers was 27 (IQR: 23–33.3) and for non-sex workers 30 (IQR: 24–39.5)	Between December 2004 and May 2005	Bangladesh	Median: 2 for both groups

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Asia	Zhao M, Du J, Lu GH, Wang QY, Xu H, Zhu M, McCoy CB. HIV sexual risk behaviors among injection drug users in Shanghai. . Drug Alcohol Depend. 2006 Apr;82 Suppl 1:S43-7.	Cross-sectional	141	IDU admitted to the Shanghai Drug Abuse Treatment Center who were at least 18 years old, sexually active in the previous 3 months and met the DSM-IV diagnostic criteria for opiate dependence.	Mean: 30.1 (SD:8.1)	Between October 2004 and March 2005	China	The participants reported having injected heroin on a daily basis for a mean of 2.4 years (SD = 2.3).

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Europe	Calleja T, Casanueva Gutiérrez M, González C. Perfil de los usuarios de drogas ingresados en un hospital. An Med Interna (Madrid) 2003; 20: 504-509	Descriptive-retrospective	111	Patients admitted to the Hospital de Cabueñ aged 15 to 65 years old whose medical report showed that they were UDI.	Mean: 33.6 (range: 19-49) years.	From January 1st 1999 to December 31st 1999	Spain	Mean: from 9.7 to 13.7 years depending on the pathology presented
Europe	Cassin S, Geoghegan T, Cox G. Young injectors: a comparative analysis of risk behaviour. Ir J Med Sci. 1998;167(4):234-7.	Cross-sectional	770 (485 young injectors - less than 25 years old- and 285 old injectors - 25 years old or more)	Total population of new clients attending the Health Promotion Unit		Between May 1st 1997 and February 28th 1998	Ireland	Mean: for young 65.71 weeks (SD:87.71) and for old, 269.08 weeks (SD: 333.64)
Europe	Copeland L, Budd J, Robertson JR, Elton RA. Changing patterns in causes of death in a cohort of injecting drug users, 1980-2001. Arch Intern Med. 2004 Jun 14;164(11):1214-20.	Cohort	153	Patients known to have ever injected drugs were recruited		1980 - 2001	Scotland	Mean time from first injection until death was 13.9 years

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Europe	Dolan KA, Donoghoe MC, Stimson GV. Reductions in HIV risk behaviour and stable HIV prevalence in syringe-exchange clients and other injectors in England. Drug Alcohol Rev. 1993;12(2):133-42.	Cohort	207	IDUs from four syringe-exchange schemes and IDUs not attending SES	Mean: for attendees it was 30.2 and non attendees 28.8	1989	England	Mean: for attendees it was 10.6 and for non-attendees, 9. Calculated by subtracting from the mean age, the age at first injection
Europe	Lidman C, Norden L, Kåberg M, et al. Hepatitis C infection among injection drug users in Stockholm Sweden: prevalence and gender. Scand J Infect Dis. 2009;41(9):679-84.	Cross-sectional	310	IDU from 6 units that care for drug users. The inclusion criteria were 1. age 18 y or older, 2. history of ever injecting drugs. Exclusion criteria were known HIV infection and previous participation in this study.	Mean: 35.6 (range: 18-67)	From March 2004 to June 2006	Sweden	Mean:12.1 (range: 0-41)
Europe	Muga R, Roca J, Egea JM, Tor J, Sirera G, Rey-Joly C, Muñoz A. Mortality of HIV-positive and HIV-negative heroin abusers as a function of duration of injecting drug use. J Acquir Immune Defic Syndr. 2000 Apr 1;23(4):332-8.	Cohort	376	Injecting heroin users referred from outpatient clinics of metropolitan Barcelona.	Mean age at entry was 26 (range 16-46)	Between February of 1987 and January of 1991	Spain	Mean: 6.1 (range: 0.1-15)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Europe	Rhodes T, Donoghoe M, Hunter G, et al. Sexual behaviour of drug injectors in London: implications for HIV transmission and HIV prevention. <i>Addiction</i> . 1994;89(9):1085-96.	Cross-sectional	516 (270 in treatment, 104 previously in treatment and 138 never in treatment)		Mean: for never in treatment it was 28, for currently in treatment , 32 and for the ones with previous experience in treatment , 30.	1991	England	Mean: for never in treatment it was 9, for currently in treatment it was 12 and for those with previous experience in treatment, 12. 60.7% injected for less than 1 year
Europe	Smyth BP, Keenan E, O'Connor JJ. Evaluation of the impact of Dublin's expanded harm reduction programme on prevalence of hepatitis C among short-term injecting drug users. <i>J Epidemiol Community Health</i> . 1999;53(7):434-5.	Cross-sectional	353	New attenders, resident in Dublin, with a reported injecting history less than 25 months, tested for anti-HCV between July 1993 and December 1996 were included.		Between July 1993 and December 1996	Ireland	

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Europe	Steffen T, Blättler R, Gutzwiller F, et al. HIV and hepatitis virus infections among injecting drug users in a medically controlled heroin prescription programme. Eur J Public Health. 2001;11(4):425-30.	Cohort	1035	Individuals in the heroin-assisted treatment programme with at least 20 years old, at least two years of opiate dependence and at least two unsuccessful treatment attempts, with documented deficiencies in a medical and/or social area.	Mean: 30.8 (SD: 5.7)	1994 to 1996	Switzerland	Mean: 10.5 (SD: 5.5).
Europe	Karapetyan AF, Sokolovsky YV, Araviyskaya ER, et al. Syphilis among intravenous drug-using population: epidemiological situation in St. Petersburg, Russia. Int J STD & AIDS 2002; 13:618–623.	Cross-sectional	105	Syphilis-positive IDU participating in the Vozvrastcheniye programme		1998	Russia	8% injected for less than a year
Europe	Gyarmathy VA, Neaigus A, Li N, Ujhelyi E, et al. Infection disclosure in the injecting dyads of Hungarian and Lithuanian injecting drug users who self-reported being infected with hepatitis C virus or human immunodeficiency virus. Scand J Infect Dis. 2010 Sep 15.	Cross-sectional	515 (215 in Hungary and 300 in Lithuania)	Street based and attendees of NEP who self-report drug injecting in the past 30 days and were at least 18 years old.	Mean: in Hungary it was 27.9 (SD: 6.5) and in Lithuania 29.8 (SD: 7.6)	In Budapest between October 2005 and December 2006. In Vilnius between March 2008 and May 2009.	Hungary and Lithuania	Mean: in Hungary 7.4 (SD: 5.3) and in Lithuania 10.1 (SD: 6.7)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Europe	Kolarić B, Stajduhar D, Gajnik D, et al. Seroprevalence of blood-borne infections and population sizes estimates in a population of injecting drug users in Croatia. Cent Eur J Public Health. 2010 Jun;18(2):104-9.	Cross-sectional	401 (121 in Split, 130 in Zagreb, 150 in Rijeka)	The inclusion criteria were: 1. had injected at least once in the last 12 months, and 2. no participation in previous survey.	Median in Zagreb it was 30 (IQR: 26-33), Rijeka 26 (IQR: 24-30) and in Split, 29 (IQR: 26-35)	2007	Croatia	Median: Zagreb 5 (IQR: 1–10), Rijeka 7 (IQR: 4–10), Split 10 (IQR: 5–15)
Europe	Vlahov D, Safaien M, Lai S, Strathdee SA, et al. Sexual and drug risk-related behaviours after initiating highly active antiretroviral therapy among injection drug users. AIDS. 2001 Nov 23;15(17):2311-6.	Cross-sectional	288	Heroin IDUs from Greece participating in a drug-treatment programme at the Eginitio Psychiatric Hospital.	Mean: 29.3 (SD: 6.2, range: 17-58)	Not mentioned	Greece	Mean: 8.2 (SD: 5.9)
Europe	Hickman M, Hope V, Brady T, et al. Hepatitis C virus (HCV) prevalence, and injecting risk behaviour in multiple sites in England in 2004. J Viral Hepat. 2007 Sep;14(9):645-52.	Cross-sectional	1058		Mean: 31	2005	England	Mean: 10.5

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Europe	Folch C, Meroño M, Casabona J. Factors associated with sharing syringes among street-recruited injecting drug users. . Med Clin (Barc). 2006 Oct 14;127(14):526-32.	Cross-sectional	300	Criteria for inclusion: 1. had injected drugs in the last 2 months, and 2. had not received treatment in the last 3 months.	Mean: 30.2 (SD: 5.1)	2004	Spain	Mean: 11,6 (6,4)
Europe	Kivelä P, Krol A, Simola S, Vaattovaara M, Tuomola P, Brummer-Korvenkontio H, Ristola M. HIV outbreak among injecting drug users in the Helsinki region: social and geographical pockets. . Eur J Public Health. 2007 Aug;17(4):381-6. Epub 2006 Nov 27.	Cohort	176 (98 early HIV cases and 47 recent HIV cases)	IDU who were HIV positive.	Mean: 33 (range: 16–63)	From 1998 until 2003	Finland	Mean: for recent cases it was 14.3 and for earlier cases, 10.7 years.
Europe	Booth RE, Kwiatkowski CF, Brewster JT, Sinitsyna L, Dvoryak S. AIDS. 2006 Nov 14;20(17):2217-23. Predictors of HIV sero-status among drug injectors at three Ukraine sites.	Cross-sectional	891	Self-reported drug injection in the previous 30 days, at least 18 years of age and not too intoxicated or otherwise incapacitated to comprehend and provide informed consent.	Mean: 28.9 (SD: 7.3)	From June 2004 to August 2005	Ukraine	Mean: 10.2 (SD: 6.8)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Europe	Stormer A, Tun W, Guli L, Harxhi A, Bodanovskaia Z, Yakovleva A, Rusakova M, Levina O, Bani R, Rjepaj K, Bino S. An analysis of respondent driven sampling with Injection Drug Users (IDU) in Albania and the Russian Federation. J Urban Health. 2006 Nov;83(6 Suppl):i73-82.	Cross-sectional	410. 210 in Tirana and 200 in St. Petersburg	Participants had to be at least 15 years old and report having injected drugs recreationally in the past 6 months.		Between July and August 2005	Albania and Russia	% injecting for less than a year: 21 (IC95%: 11, 24) in Albania and 6 (IC95%: 3, 9) in Russia
Europe	Muga R, Sanvisens 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 Alcohol Depend. 2006 Apr;82 Suppl 1:S29-33.	Cross-sectional	2219(divided by period of admission .1987-1989:452. 1990-1992: 560.1993-1995:525. 1996-1998: 395.1999-2001: 287)	All IDU admitted between February 1987 and December 2001 to the detoxification units of two major hospitals (Hospital Universitari Germans Trias i Pujol and Hospital Universitari de Bellvitge) in metropolitan Barcelona.		Between February 1987 and December 2001	Spain	Mean (SD): 1987-1989: 6.3 (3.1), 1990-1992: 7.1 (3.6), 1993-1995:7.4 (5.0), 1996-1998: 8.0 (5.6), 1999-2001: 10.2 (6.6).

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Europe	Backmund M, Meyer K, Schuetz C, Reimer J. Factors associated with exposure to hepatitis B virus in injection drug users. Drug Alcohol Depend. 2006 Sep 15;84(2):154-9. Epub 2006 Feb 14.		1018	Patients were included in the study, in case both criteria 1. opioid dependency, and 2. confirmed needle-sharing at least once were met	Mean: 28.3 (SD: 6.1)	From April 1991 until April 1997	Germany	Mean: 7.7 (SD: 5.6). Calculated by subtracting from the mean age, the mean age at first injection
Europe	Platt L, Rhodes T, Lowndes CM, 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. Sex Transm Dis. 2005;32(10):605-12.	Cross-sectional	426, 268 Male IDU, 89 FIDU non SW and 66 FSWIDU	IDU were those who injected within the last 4 weeks and sex work was defined as having exchanged anal, vaginal, or oral sex for money or goods within the last 4 weeks.	Mean: for male IDU it was 26.8 (SD: 7.1), for the female IDU non SW it was 23.8 (SD: 5.4) and for the FSWIDU it was 23.8 (SD: 4.7)	2001	Russia	Mean: for males it was 7.9, for Non FSWIDU it was 5.6 and for FSWIDU it was 6.4. Calculated by subtracting from the mean age, the mean age at first injection.
Europe	Gyarmathy VA, Neaigus A. Marginalized and socially integrated groups of IDUs in Hungary: potential bridges of HIV infection. J Urban Health. 2005 Sep;82(3 Suppl 4):iv101-12.	Cross-sectional	29	Eligible participants were those who 1. self-reported injecting drugs at least once in the past 30 days, and 2. were 30 years of age or younger.	Mean: 23.6 (SD: 3.6)	Between May 2003 and January 2004	Hungary	Mean: 6.8 (SD: 2.7)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
Europe	Maliphant J, Scott J. Use of the femoral vein ('groin injecting') by a sample of needle exchange clients in Bristol, UK. . Harm Reduct J. 2005 Apr 15;2(1):6.	Cross-sectional	92	All clients who used the needle exchange services staffed by the interviewer were invited to take part in the study.		2004	England	Mean: 9.6 (SD: 7.0, range: 0.5-30)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
South America	de Azevedo RC, Botega NJ, Guimarães LA. Crack users, sexual behavior and risk of HIV infection. Rev Bras Psiquiatr. 2007 Mar;29(1):26-30.	Cross-sectional	109	Injecting cocaine users. The inclusion criteria were: 1. literate individuals, 2. > 16 years old and 3. use of injecting cocaine over the last 12 months	Mean: 27.5 (SD: 7.1)		Brazil	Mean: 9.5 (SD:6.4)
South America	Marchesini AM, Prá-Baldi ZP, Mesquita F, Bueno R, Buchalla CM. Hepatitis B and C among injecting drug users living with HIV in São Paulo, Brazil]. Rev Saude Publica. 2007 Dec;41 Suppl 2:57-63.	Cross-sectional	205	IDU living with HIV/AIDS in treatment at facilities of the Municipal STD/AIDS Health Department of São Paulo.	Mean: 39 (SD: 6.1)	2003	Brazil	Mean: 21. Calculated by subtracting from the mean age, the mean age at first injection.
South America	Dourado I, Andrade T, Carpenter C, Galvao-Castro B. Risk Factors for Human T Cell Lymphotropic Virus Type I among Injecting Drug Users in Northeast Brazil: Possibly Greater Efficiency of Male to Female Transmission. Mem Inst Oswaldo Cruz, Rio de Janeiro, Vol. 94(1): 13-18, Jan./Feb. 1999	Cross-sectional	216		Mean: 24.6 and 27.4 for males and females respectively at baseline.	1994 to 1996	Brazil	Median: 6 for males and 8 for females.

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
South America	Lima ES, Friedman SR, Bastos FI, Telles PR, Friedmann P, Ward TP, des Jarlais DC. Risk factors for HIV-1 seroprevalence among drug injectors in the cocaine-using environment of Rio de Janeiro. <i>Addiction</i> . 1994 Jun;89(6):689-98.	Cross-sectional	123	Respondents were recruited both in drug treatment centers and in the streets were eligible to be interviewed and HIV antibody tested if they had injected drugs at least once in the 2 months prior to the interview.	Mean: 29.3 (SD = 5.7)	Between September 1989 and April 1992	Brazil	Average number of years injected drugs was 10.4 (SD: 6.3)
South America	Oliveira Mde L, Bastos FI, Telles PR, Hacker Mde A, Oliveira SA, Miguel JC, Yoshida CF. Epidemiological and genetic analyses of Hepatitis C virus transmission among young/short- and long-term injecting drug users from Rio de Janeiro, Brazil. <i>J Clin Virol</i> . 2009 Mar;44(3):200-6. Epub 2009 Feb 4.	Cross-sectional	606 (299 short- and 307 long-term IDU)		Mean: 27.4 (SD: 8.8) in short term and 36.7 (SD: 8.3) in long term.	From 1999 to 2001	Brazil	Mean: 2.2 (SD: 1.9) for short term and 16.1 (SD: 7.7) for long term.

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using
South America	Caiaffa WT, Bastos FI, Freitas LL, Mingoti SA, Proietti FA, Carneiro-Proietti AB, Gandolfi D, Doneda D; Projeto AjUDE-Brasil I; Projeto AjUDE-Brasil II. The contribution of two Brazilian multi-center studies to the assessment of HIV and HCV infection and prevention strategies among injecting drug users: the AjUDE-Brasil I and II Projects. Cad Saude Publica. 2006 Apr;22(4):771-82. Epub 2006 Apr 5.	Cross-sectional	1144 (287 were recruited during the AjUDE-Brasil I Project and 857 during the AjUDE-Brasil II Project.	Non-institutionalized IDUs.	Mean: for the AjUDE-Brasil I it was 29.2 (SD: 7.9) and for the AjUDE-Brasil II, 28.5 (SD: 8.2).	Ajude I: 1998. Ajude II: 2000 to 2001	Brazil	Mean: for AjUDE-Brasil I it was 11.6 (SD: 7.6) and for . AjUDE-Brasil II: 9.8 (SD: 7.7)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Africa	McCurdy SA, Ross MW, Williams ML, Kilonzo GP, Leshabari MT. Flashblood: blood sharing among female injecting drug users in Tanzania. Addiction. 2010 Jun;105(6):1062-70. Epub 2010 Mar 12.	Cross-sectional	169	Participants should be at least aged 18 years, have injected heroin during the 48 hours before our screening and have engaged in sex at least once during the 30 days before screening.	Mean: 25.6 (SD: 5.5)	Between May 2005 and September 2006.	Tanzania	Mean: 2.8. Calculated by subtracting from the mean age, the mean age at first injection.
Africa	Ross M, McCurdy S, Kilonzo G, Williams M, Leshabari M. Drug Use Careers and Blood-borne Pathogen Risk Behavior in Male and Female Tanzanian Heroin Injectors. Am. J. Trop. Med. Hyg., 79(3), 2008, pp. 338–343.	Cross-sectional	534	Eligibility criteria required that participants 1. were at least 18 years of age, 2. had injected an illicit drug in the past 48 hours before being screened, and 3. had had sex at least once in the 30 days before screening.	From 18 to 59 years (mean age: 27.9 years, median 27 years)	From May 2005 through September 2006	Tanzania	Mean: 3.7. Median: 3. 18% started injecting in less than a year.

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Oceania	Darke S, Kelly E, Ross J. Drug driving among injecting drug users in Sydney, Australia: prevalence, risk factors and risk perceptions. <i>Addiction</i> . 2004 Feb;99(2):175-85.	Cross-sectional	300	IDU aged 18 or over and to have injected a drug in the previous 6 months	Mean: 31.8	From April to November 2002	Australia	Mean: 12.4. Calculated by subtracting from the mean age, the age at first injection.
Oceania	Day C, Conroy E, Lowe J, Page J, Dolan K. Patterns of drug use and associated harms among rural injecting drug users: comparisons with metropolitan injecting drug users. <i>Aust J Rural Health</i> . 2006 Jun;14(3):120-5.	Cross-sectional	260	IDU recruited through needle and syringe programs, snowballing techniques and advertisement.	Mean: 33	Not mentioned	Australia	Mean: 15. Calculated by subtracting from the mean age, the age at first injection.
Oceania	Iversen J, Wand H, Gonnermann A, Maher L. Gender differences in hepatitis C antibody prevalence and risk behaviours amongst people who inject drugs in Australia 1998-2008. <i>Int J Drug Policy</i> . 2010 May 14.	Cross-sectional	15852	Attending selected NSP sites	Mean: 31 (SD: 8.8)	1998–2008	Australia	Mean: 11. Calculated by subtracting from the mean age, the age at first injection.
Oceania	Lenton S, Kerry K, Loxley W, Tan-Quigley A, Greig R. Citizens who inject drugs: the 'Fitpack' study. <i>Int J Drug Policy</i> . 2000 Aug;11(4):285-97.	Cross-sectional	511	Drug injectors with little or no prior drug treatment that used Fitpack.	Mean: 26.2	1995	Australia	Mean: 7.1.

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Oceania	Maher L, Li J, Jalaludin B, Chant KG, Kaldor JM. High hepatitis C incidence in new injecting drug users: a policy failure? Aust N Z J Public Health. 2007 Feb;31(1):30-5.	Cohort	204	Eligibility criteria for the study were that participants had injected drugs in the past six months and were unaware of their antibody HCV status or knew their serostatus to be negative.	Mean: 21.8 (SD: 4.05)	Between 1999 and 2002	Australia	19.12% started injecting in less than a year
Oceania	White JM, Dyer KR, Ali RL, Gaughwin MD, Cormack S. Injecting behaviour and risky needle use amongst methadone maintenance clients. Drug Alcohol Depend. 1994 Jan;34(2):113-9.	Cohort	111	IDU attending methadone maintenance program.	Mean: 30.1 (SD: 5.3, range: 19-45)	August of 1991	Australia	Mean: 7.0 (SD: 5.7; range: 1-21)
Oceania	Miller ER, Hellard ME, Bowden S, Bharadwaj M, Aitken CK. Markers and risk factors for HCV, HBV and HIV in a network of injecting drug users in Melbourne, Australia. J Infect. 2009 May;58(5):375-82. Epub 2009 Mar 27.	Cross-sectional	328	Street based IDU.	Median: 25.3 (range: 14.4-53)	July 2005 to May 2007	Australia	Median: 7.6 (range: 0.17-36)
Oceania	Stoové MA, Dietze PM, Aitken CK, Jolley D. Mortality among injecting drug users in Melbourne: a 16-year follow-up of the Victorian Injecting Cohort Study (VICS). Drug Alcohol Depend. 2008 Aug 1;96(3):281-5. Epub 2008 Apr 22.	Cohort	626		Mean: 28 (SD: 6.6)	Recruited between 1990 and 1995, followed until 2006	Australia	Mean: 17 (SD: 7.05, range: 3.86-29.79). The average length of injecting career at death.

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Oceania	Bryant J, Treloar C. Initiators: an examination of young injecting drug users who initiate others to injecting. . AIDS Behav. 2008 Nov;12(6):885-90. Epub 2007 Dec 21.	Cross-sectional	324 (55 IDU who have initiated others into IDU and 269 non-initiators)	Eligibility criteria included: 1. current or recent injecting drug use (within previous 6 months), 2. injecting history of 5 years or less, and 3. aged 16–25 years.	20.6 years for non initiators and 21.9 for initiators.	Between December 2000 and February 2002	Australia	2.4 for non initiators and 3.2 for initiators
Oceania	Hellard ME, Nguyen OK, Guy RJ, Jardine D, Mijch A, Higgs PG. The prevalence and risk behaviours associated with the transmission of blood-borne viruses among ethnic-Vietnamese injecting drug users. AUSTRALIAN AND NEW ZEALAND JOURNAL OF PUBLIC HEALTH. 2006 vol. 30 no. 6	Cross-sectional	127	Candidates were eligible to participate in the study if they were ethnic-Vietnamese and had injected drugs in the previous 12 months.	Median: for male participants was 26 (range: 15-51) and for female participants was 22 (range: 15-30).	2003	Australia	Median: 4.1 (range: 0.05-21.6)
Oceania	Cao W, Treloar C. Comparison of needle and syringe programme attendees and non-attendees from a high drug-using area in Sydney, New South Wales. Drug Alcohol Rev. 2006 Sep;25(5):439-44.	Cross-sectional	264 (102 who had never attended a NSP (non-NSP attendees) and 162 participants who had previous experience of NSP (NSP attendees).	Non-NSP: people who either lived, worked or visited South East Sydney, had injected drugs at least once in the 6 months prior to the study and did not use a NSP as their primary source of injecting equipment were eligible for inclusion in the study. NSP: All clients attending selected NSP	Non-NSP attendees were younger than NSP attendees (29 vs. 33 years).	2003		Mean: for non-NSP attendees it was 8 and for NSP attendees, 14

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
Oceania	Roxburgh A, Degenhardt L, Breen C. Drug use and risk behaviours among injecting drug users: a comparison between sex workers and non-sex workers in Sydney, Australia. Harm Reduct J. 2005 Jun 6;2(1):7.	Cross-sectional	154 (22 IDU sex workers and 132 IDU non SW)	Eligibility criteria for entry into the study were: 1. at least monthly injection in the six months preceding the interview, 2. residence in Sydney for twelve months preceding the interview, with no significant periods of incarceration or residence in inpatient rehabilitation programs.	Mean: for IDUSW it was 32 and for the IDU non sex workers it was 33.	2003	Australia	Mean: for SW: 14.4 and for NSW, 12.7. Mean calculated by subtracting from the mean age.

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Chitwood DD, Comerford M, Kitner KR, Palacios W, Sanchez J. A comparison of HIV risk behaviors between new and long-term injection drug users. Subst Use Misuse. 2001 Jan;36(1-2):91-111.	Cohort	600	300 New IDUs (NIDU) who had initiated injection within 4 years before recruitment and who had injected at least weekly for the previous 6 months; 2) 300 Later IDUs (LIDU) who had initiated injection before January 1, 1984, and who had injected at least weekly for the previous 6 months	Mean: for New IDUs it was 32 compared with 42.8 for Later IDUs.	Recruited between July 1997 and August 1999.	USA	NIDU: mean 1.9 years. LTIDU: mean 23.9. Calculated by subtracting from the mean age, the age at first injection
North America	Corsi KF, Lehman WK, Booth RE. The effect of methadone maintenance on positive outcomes for opiate injection drug users. J Subst Abuse Treat. 2009 Sep;37(2):120-6. Epub 2009 Jan 15.	Cohort	160	People who self-reported opiate injection in the prior 30 days; were 18 years of age or older; did not self-reported substance abuse treatment during the previous 30 days	Mean: 39	From 2000 through 2004	USA	Mean: 19
North America	Debeck K, Kerr T, Bird L, et al. Injection drug use cessation and use of North America's first medically supervised safer injecting facility. Drug Alcohol Depend. 2010 Aug 26	Cohort	902	IDU in supervised injecting facility (SIF)	Median: 39 (IQR: 33-45)	Between December 2003 and June 2006	Canada	Median: 17 (IQR: 9-26)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Doherty MC, Garfein RS, Monterroso E, Brown D, Vlahov D. Correlates of HIV infection among young adult short-term injection drug users. AIDS. 2000 Apr 14;14(6):717-26.	Cohort	229	Inclusion criteria: 1. age 18 to 29 years and 2. having injected within the year preceding enrollment	Mean: 22.8 (range: 18-29)	From August 1994 through May 1996	USA	Median: 3
North America	Garfein RS, Doherty MC, Monterroso ER, Thomas DL, Nelson KE, Vlahov D. Prevalence and incidence of hepatitis C virus infection among young adult injection drug users. J Acquir Immune Defic Syndr Hum Retrovirol. 1998;18 Suppl 1:S11-9.	Randomized controlled trial	854 (431 in peer educational intervention group and 423 in video discussion intervention)	HIV and HCV antibody negative IDU, who used drugs in the last 6 months, aged 15–30 years, recruited in five United States cities.	Mean: for peer educational group it was 23.8 (SD: 3.5), for video discussion group, 23.8 (SD: 3.7)	Between May 2002 and January 2004	USA	Mean: for peer educational group it was 4.2 (SD: 3.4) and for video discussion group it was 4.4 (SD: 3.5)
North America	Hahn JA, Page-Shafer K, Lum PJ, Ochoa K, Moss AR. Hepatitis C virus infection and needle exchange use among young injection drug users in San Francisco. Hepatology. 2001 Jul;34(1):180-7.	Cross-sectional	312	Under age 30, reported injecting drugs in the prior month, and spoke English as their primary language	Median: 22 (IQR: 20-25)	Between November 1997 and February 1999	USA	Median: 5 (IQR: 2-8). 14.6% started injecting for less than a year

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Huo D, Bailey SL, Ouellet LJ. Cessation of injection drug use and change in injection frequency: the Chicago Needle Exchange Evaluation Study. Addiction. 2006 Nov;101(11):1606-13.	Cohort	707 (591 who continued injection and 116 who ceased injection)	Eligible participants had to 1. have injected drugs in the past 6 months, 2. speak English or Spanish and 3. be at least 18 years old	Mean: 41 (SD: 10) among those who continued injecting and 36 (SD: 11) among the ones who had ceased injecting.	Between 1997 and 2000	USA	Mean: for those who still inject it was 15 (SD: 17) and for those who ceased it was 9.5 (SD: 18)
North America	Mehta SH, Galai N, Astemborski J, et al. HIV incidence among injection drug users in Baltimore, Maryland (1988-2004). J Acquir Immune Defic Syndr. 2006 Nov 1;43(3):368-72.	Cohort	1983	All participants acknowledged 1. nonmedical injection drug use within the prior 11 years, 2. were 18 years of age or older, and 3. were free of AIDS at entry into the study.	Median age at enrollment it was 35 (IQR: 30-40)	Between 1988 and 1989	USA	Median: 14 (IQR: 6-20)
North America	Miller CL, Johnston C, Spittal PM, Li K, Laliberté N, Montaner JS, Schechter MT. Opportunities for prevention: hepatitis C prevalence and incidence in a cohort of young injection drug users. Hepatology. 2002 Sep;36(3):737-42.	Cohort	234 (107 HCV positive and 127 HCV negative)	IDU residing in the city of Vancouver and surrounding municipalities, having injected in the previous month, and aged 13 years and older.	Median: for the HCV positive it was 22 (IQR: 20-23) and for the HCV negative it was 20 (IQR: 18-22)	Since 1996	Canada	Median: for HCV+ it was 4 (IQR, 2-7) and for HCV -1.3 (IQR: 0.3-3). % started injecting for less than a year: HCV+: 20. HCV-: 51

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Neaigus A, Friedman SR, Jose B, et al. High-risk personal networks and syringe sharing as risk factors for HIV infection among new drug injectors. J Acquir Immune Defic Syndr Hum Retrovirol. 1996 Apr 15;11(5):499-509.	Cross-sectional	174	Street-recruited new IDUs in the Bushwick section of Brooklyn in New York City. Subjects recruited for the study had to be 1. ≥ 18 years of age and 2. had to have injected drugs within the 12 months prior to the interview	Mean: 30	Between July 1991 and January 1993	USA	Mean: 2.6 (SD:1.7). Median: 1.0. 17% started injecting for less than a year
North America	Pouget ER, Deren S, Fuller CM, et al. Receptive syringe sharing among injection drug users in Harlem and the Bronx during the New York State Expanded Syringe Access Demonstration Program. J Acquir Immune Defic Syndr. 2005 Aug 1;39(4):471-7.	Cross-sectional	1181		Mean: 37.4 (SD: 8.60)	From January 2001 through June /2003	USA	Mean: 16.2 (SD: 10.24)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Roy E, Boudreau JF, Boivin JF. Hepatitis C virus incidence among young street-involved IDUs in relation to injection experience. Drug Alcohol Depend. 2009 Jun 1;102(1-3):158-61. Epub 2009 Feb 28.	Cohort	160	Participants were included if in the last year, they had either been without a place to sleep more than once, or regularly used the services of street youth agencies (drop-in centers, shelters or outreach vans); they were 14–23 years of age; had ever injected drugs and spoke French or English.	Mean 20 (range: 15–26) at baseline.	From July 2001 to December 2005	Canada	Median: 2.7 27.5% started injecting for less than a year
North America	Schütz CG, Rapiti E, Vlahov D, Anthony JC. Suspected determinants of enrollment into detoxification and methadone maintenance treatment among injecting drug users. Drug Alcohol Depend. 1994 Oct;36(2):129-38.	Cross-sectional	2879	Eligibility for enrollment in the study included 1. age of 18 years or older, and 2. a history of injecting illicit drugs at any time within the previous 11 years.	Median: 34	Between 1988 and 1989	USA	Median: 12

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Steensma C, Boivin JF, Blais L, Roy E. Cessation of injecting drug use among street-based youth. J Urban Health. 2005 Dec;82(4):622-37. Epub 2005 Sep 29.	Cohort		Elegibility criteria were 1. being "street active," 2. between 14 and 25 years of age, 3. English or French speaking, 4. able to provide informed consent and 5. complete a questionnaire, reported having injected drugs at least once within the 6 months before entry into the MSYC study, or reported no injecting experience before entry into the MSYC study but subsequently reported injecting drugs at least once in at least one follow-up questionnaire	Mean: 20 (SD: 2.5; range:14.1-25.7)		Canada	Mean: 2.9 (SD: 2.5, range: 0.1-14.7)
North America	Vlahov D, Safaien M, Lai S, Strathdee SA, et al. Sexual and drug risk-related behaviours after initiating highly active antiretroviral therapy among injection drug users. AIDS. 2001 Nov 23;15(17):2311-6.	Cohort	316	IDU who were HAART eligible.		1996 to 1998	USA	Median: 13

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Wood E, Stoltz JA, Zhang R, Strathdee SA, Montaner JS, Kerr T. Circumstances of first crystal methamphetamine use and initiation of injection drug use among high-risk youth. Drug Alcohol Rev. 2008 May;27(3):270-6.	Cohort	201	Eligibility criteria for the study included 1. age 14 – 26 years at baseline and 2. use of illicit drugs other than marijuana in the past 30 days.		Between September 2005 and October 2006	Canada	Median: for those whose first injection experience involved crystal methamphetamine it was 4.6, for those who initiated injecting with heroin, 8.3 and for those who initiated injecting with cocaine, 7.4
North America	Evans JL, Hahn JA, Lum PJ, Stein ES, Page K. Predictors of injection drug use cessation and relapse in a prospective cohort of young injection drug users in San Francisco, CA (UFO Study). Drug Alcohol Depend. 2009 May 1;101(3):152-7. Epub 2009 Jan 31. Drug Alcohol Depend. 2009 May 1;101(3):152-7. Epub 2009 Jan 31.	Cohort	365	street based IDUs under the age of 30	Median: 22 (IQR: 20–26)	From January 2000 through February 2008	USA	Median: 3.6 (IQR: 1.3–6.5)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Lum PJ, Hahn JA, Shafer KP, et al. Hepatitis B virus infection and immunization status in a new generation of injection drug users in San Francisco. J Viral Hepat. 2008;15(3):229-36.	Cross-sectional	831	Eligible persons reported a history of injecting drug use in the last 30 days and an age of 29 years or under.	Median: 22 years (IQR: 20–25)	From January 2000 to January 2002	USA	Median: 4 (IQR: 2–7)
North America	Shaw SY, Shah L, Jolly AM, et al. Determinants of injection drug user (IDU) syringe sharing: the relationship between availability of syringes and risk network member characteristics in Winnipeg, Canada. . Addiction. 2007;102(10):1626-35.	Cross-sectional	435	Eligibility criteria included self-reported use of illicit injection drugs in the 6-month period prior to interview and age 15 years or more.	Mean: 34.9 (SD: 9.9)	December 2003 to September 2004	Canada	Mean: 13.8 (SD: 9.9)
North America	Neaigus A, Gyarmathy VA, Miller M, et al. Injecting and sexual risk correlates of HBV and HCV seroprevalence among new drug injectors. Drug Alcohol Depend. 2007;10;89(2-3):234-43. Epub 2007 Feb 7.	Cross-sectional	259	Eligible participants were between 18 and 30 years of age, had initiated drug injecting within the prior six years, and had injected drugs within the prior 30 days.	Mean: 22.8 (SD: 3.3)	Between February 1999 and February 2003,	USA	Mean: 2.9

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Hagan H, Campbell J, Thiede H, et al. Self-reported hepatitis C virus antibody status and risk behavior in young injectors. Public Health Rep. 2006 Nov-Dec;121(6):710-9.	Cross-sectional	3,004	Individuals aged 15 to 30 years old who reported injection of any illicit drug in the previous six months.	Mean: 23.8 (median: 24)	From May 2002 to January 2004	USA	Mean: 5. Median: 4.
North America	Miller CL, Kerr T, Strathdee SA, Li K, Wood E. Factors associated with premature mortality among young injection drug users in Vancouver. Harm Reduct J. 2007 Jan 4;4:1	Cohort	572	Persons were eligible if they had injected illicit drugs at least once in the previous month confirmed by track site inspection, were aged 14 years and older and resided in the greater Vancouver region and were 29 years old or younger.	Median: 23.9 (IQR: 20.9–26.3) at baseline.	Between May 1996 and December 2004	Canada	Median: 4 (IQR: 1.5–8)
North America	Wylie JL, Shah L, Jolly AM. Demographic, risk behaviour and personal network variables associated with prevalent hepatitis C, hepatitis B, and HIV infection in injection drug users in Winnipeg, Canada. BMC Public Health. 2006 Sep 13;6:229.	Cross-sectional	369	Eligibility criteria were 1. self-reported use of illicit injection drugs in the 6 month period prior to interview and 2. age 15 years or more.		Between December 2003 and September 2004	Canada	Median: 13 (IQR: 6–21)

Region	Reference	Methodology	Sample size	Sample definition	Age (years)	Year of data collection	Country	Duration of injected drug using (years)
North America	Miller CL, Strathdee SA, Spittal PM, Kerr T, Li K, Schechter MT, Wood E. Elevated rates of HIV infection among young Aboriginal injection drug users in a Canadian setting. Harm Reduct J. 2006 Mar 8;3:9.	Cohort	291, 80 (27%) were Aboriginal and 211 (73%) were non-Aboriginal.	IDU aged 24 years and younger.	Median: for the Aboriginal it was 16 (IQR: 14–18) and for the non-Aboriginal, 17 (IQR: 15–19).	Between May 1996 and May 2003	Canada	Median: for Aboriginal youth was 5 (IQR: 2–8) and for non-aboriginal, 3 (IQR: 1–5).
North America	Pugatch D, Anderson BJ, O'Connell JV, Elson LC, Stein MD. HIV and HCV testing for young drug users in Rhode Island. J Adolesc Health. 2006 Mar;38(3):302-4.	Cross-sectional	86, 42 who were not tested for HCV and 44 who were tested	Eligibility for the current analysis included: 1. age 18–25 years, 2. heroin or cocaine injection in the past 30 days, and 3. providing informed consent.	Mean: for the tested was 23.05 (SD: 1.95), and for the not tested, 22.09 (SD: 1.82).	March 2001 to February 2004	USA	Mean: for the ones who were tested, 3.8 (SD: 2.93) and for the not tested, 2.9 (SD: 2.42).
North America	Lum PJ, Sears C, Guydish J. Injection risk behavior among women syringe exchangers in San Francisco. Subst Use Misuse. 2005;40(11):1681-96	Cross-sectional	149	Eligibility criteria were 1. self-reported age greater than 17 years, 2. history of drug injection during the preceding 30 days, and 3. syringe exchange at that site on the day of recruitment.	Median: 38 (IQR: 28–45)	1997	USA	Median: 18. Calculated by subtracting from the median age, the median age at first injection.