

Clients of sex workers in different regions of the world: hard to count

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Objectives: To estimate the proportion of the male population that reports having paid for sex in different regions.

Methods: Clients of sex workers were identified from representative samples of men asked in face-to-face interviews whether they had had sex in exchange for money or whether they had paid for sex, in the last 12 months. A total of 78 national household surveys and nine city based surveys were selected for inclusion. Where such surveys were not available, results of behavioural surveillance surveys and of research studies were also used. Using national estimates, a median percentage of men who reported paying for sex was calculated for each region.

Results: The median percentage of men who exchanged sex for money in the last 12 months in all regions was around 9–10%, with estimates from 13% to 15% in Central African region, 10 to 11% in Eastern and southern Africa, and 5–7% in Asia and Latin America. Estimates for men who paid sex were much lower at around 2–3% with ranges from 7% in the South African region to 1% in Asia and West Africa.

Conclusions: Although errors of measurement and critical issues of definitions and interpretation exist, this compilation represents a first attempt to obtain reasonably coherent estimates of the proportion of men who were clients of sex workers at regional level. Large discrepancies between regions were found. Further improvements in national estimates will be critical to monitor coverage of HIV prevention programmes for sex workers and clients, and to improve estimates of national HIV infection prevalence levels in low and concentrated HIV epidemics.

The role of commercial sex in facilitating the spread of HIV depends among other things on the proportion of the male population who have unprotected sex with female sex workers as well as the number and characteristics of the other sexual partners of these clients. The literature describes the large national or regional variations in these proportions. For example, in 1997, in Northeastern Thailand, Maticka-Tyndale *et al*¹ noted that “50% of married men and 43% of single men had visited female sex workers in their life”. In contrast, in Orissa, a rural district in India, Collumbien *et al*² reported that “less than two per cent of men have had any sex encounter with sex workers”.

Many studies have highlighted a great variety in the mix between commercial and non-commercial sexual contacts of clients of sex workers.^{3–4} In most regions, a substantial proportion of clients are married and also have regular girlfriends; women involved in non-commercial sexual relationships are usually largely unaware that their partners may link them to a larger network of sexual contacts and associated risks of HIV/STIs.

Sex workers, clients, and their partners are an important target group for HIV/STI prevention because they usually have higher incidence of STI, especially genital ulcerations and HIV;^{5–6} and because programmes addressing their needs have been shown to be successful in a variety of settings.^{7–10}

Several methods have previously been used to study the potential role of male clients in spreading HIV to large sexual networks. The first involves interviewing known clients of female sex workers about the number and types of their sexual partners.^{11–14} This is useful in monitoring change in sexual networks and risk behaviours, but does not allow one to estimate the prevalence of contacts with sex workers among men. Secondly, one can estimate the proportion of men who are clients of sex workers based on the number of clients reported by female sex workers. This method is potentially biased by assumptions about the number and

characteristics of sex workers. A third method is to use survey data from both sex workers (average number of clients per week) and clients (average number of visits to sex worker).^{15–16} The fourth method uses national population surveys to identify clients of female sex workers by asking men about their sexual partners, including those in exchange for money or goods, or whether they have paid for sex, in the last 12 months.¹⁷ The majority of articles and reports reviewed in this paper used this method to estimate the proportion of men having contacts with sex workers.

DATA AND METHODS

For estimating the national and regional prevalence of sexual contacts with sex workers, the authors selected mainly national or city based population probability surveys, where men were asked in face-to-face interviews about whether they have had sex in exchange for money or goods, or whether they have had paid sex, in the last 12 months. Where such surveys were not available, especially in low and concentrated HIV epidemics, results of behavioural surveillance surveys and of published and unpublished research studies were also used.

The major source of data was the Demographic and Health Surveys (DHS).¹⁸ Data were also collected from surveys coordinated by The Global Program on AIDS (GPA) of the World Health Organization (WHO) in the late 1980s/early 1990s (referred to as GPA) and from a series of surveys in Europe from the early 1990s, based on the same model.¹⁹ Another set of European surveys, known as New Encounter Module surveys, (NEM) were also used.²⁰

Abbreviations: BSS, Behavioral Surveillance Surveys; DHS, Demographic and Health Surveys; GPA, Global Program on AIDS; IDU, injecting drug user; MSM, men who have sex with men; NEM, New Encounter Module; UNAIDS, Joint United Nations Programme on HIV/AIDS; WHO, World Health Organization.

The criteria used to select the surveys for this analysis were: a sampling approach using probability samples of men, either at national level or at city level; adherence to a standard definition of "sex work" contact; dating from 1989 onwards. Surveys with clean and documented data files were preferred. National surveys were also available for Botswana, Chile, and Australia.

Using these criteria, 78 nationally representative household surveys were selected (47 DHS, 1 CDC Reproductive Health Survey, 9 GPA, and 21 from other sources)

Behavioral Surveillance Surveys (BSS) use reliable methods to track HIV risk behaviours over time, typically among high risk groups, as part of an integrated surveillance system which monitors various aspects of the epidemic. Most of the BSS datasets are not publically available but many results can be found in on the website of Family Health International.²¹ Country specific BSS results were used only when there was no national survey that fulfilled the criteria defined above.

Other data sources include six African city surveys carried out in 1997–98 and in 2002 in Ouagadougou, Burkina-Faso (hereafter called the African multisite study).²²

Geographical representation is very uneven. There are few surveys from Latin America and the Caribbean, Asia, and the Pacific region. Region definitions have been adapted from the Joint United Nations Programme on HIV/AIDS (UNAIDS) classification;²³ in addition, all industrialised countries have been grouped in one category (high income countries). For each geographical region, when the number of surveys allows it, the median percentage of sex worker contact in the last 12 months was calculated with the 25th and 75th quartile, as well as the mean. When more than one survey was available for a country and the sex worker contact definition remained the same, only the most recent survey data were used.

In many earlier DHS surveys in sub-Saharan Africa, an extended definition of sex worker relationships was used: "In the last year, have you had sex in exchange for gifts, favours or money"? In the later surveys, men are asked "did you have sex in exchange for money in the last 12 months"; "did you pay for sex in the last 12 months"; or "did you have sex with a sex worker". When any of these last three definitions are used, an asterisk (*) is attached to the name of the country (see table 1 and online table A (<http://www.stijournal.com/supplemental>)). For the sub-Saharan African regions, two regional estimates are given (where possible) when two different definitions of sex workers were used: one for the countries using the extended definition (sex in exchange of gifts, favours, or money) and one for the direct definition (paid for sex or sex with a sex worker).

The denominator typically used to calculate the median and the mean includes all male respondents in the age range 15–49. However, in some countries, the denominator used was "all sexually active men", or "married men": such few cases are indicated in the footnotes of table 1 and online table A (<http://www.stijournal.com/supplemental>). The use of all men as the denominator allows sensitivity to temporal changes in the proportion of men who have ever had sex and who have had sex in the last year. This is especially important in countries where much of men's early sexual experience is with sex workers.

In addition to national data extracted from population surveys, a complete search was made of Medline and Popline to include data from research studies, using the keywords "sex workers", "sexual behavior", "clients of sex workers", and the name of the country. This was for countries where there was no estimate from a national probability survey.

The prevalence of contact with sex workers was compared between urban and rural men and between young men^{15–24} and older men.^{25–49} Differences between urban and rural men were tested using the Pearson design based χ^2 test.

RESULTS

Overview of survey data

Results from 87 surveys were used: 78 national and nine city based samples (see table 1 and online table A). The national surveys include 54 countries. National surveys were repeated in 23 countries. Five per cent of these surveys were carried out in 1989, 60% between 1990 and 1999; 35% between 2000 and 2004.

In western sub-Saharan Africa, national surveys were conducted in 10 countries. Based on the nine national surveys that used the extended definition of sex worker contact, the median frequency was 8.9% with 5.7 and 9.7 as Q1 and Q3, and the mean is 8.6%. For the five countries where the restricted definition of sex worker contacts was used, the median and the mean are 0.5% and 1.1%, respectively (see table 2).

BSS were conducted in 2002 in five cities in Burkina-Faso and 11 sites in Cote d'Ivoire. Sex with sex workers was reported by 24% of truckers in both countries and 5% of rural migrants in Cote d'Ivoire.¹⁹ Results from 2002 BSS among young people in these two countries mirror those of DHS.¹⁹

In Central Africa, surveys were carried out in five countries. When sex worker contact was defined as "sex in exchange of gifts, favours or money", the median prevalence was 13.6% (12.8–14.8) and the mean was 14.6%. In seven sites in Cameroon, in 2001, 4% of young men aged 15–19 reported paying for sex in the last 12 months.¹⁹ The median of the four later surveys, which used the restricted definition, was 1.6% (0.7%–9.8%) with a mean of 4%.

In Eastern Africa, data are available from six countries. Using the extended definition the median prevalence was 9.8% (five surveys) and the interquartile range was 8.6–11.9. The mean prevalence was 11.9. Using the restricted definition the median was 1.5% (0.8–1.5) and the mean was 1.3%.

In Southern Africa, data are available from seven countries. The median and the mean for four surveys that used the extended definition of sex worker contact is 11.3% (6.6–18.9) and 12.8%; the median and the mean for seven surveys using "sex in exchange for payment" is 7% (1.7–10.6) and the mean is 6.3%. BSS in Ethiopia and Kenya found a much higher frequency of commercial sex among groups such as sexually active youth out of school or men living in slums. In 2000, 47% and 30% of truck drivers in Rwanda and Zambia reported commercial sex, respectively.¹⁹

Estimates based on the extended definition of sex worker, used in surveys carried out in the late 1990s, are highest in Central Africa, followed by Southern, Eastern, and Western Africa. The level of sex worker contact is much lower when the restricted definition is used (table 2)

In other regions, there were fewer recent national surveys on commercial sex; sex work contact is often associated with specific male occupations and less with the "general" population. In most of these regions, the definition of commercial sex was "paid sex" or "sex with a sex worker".

In South and South East Asia and the Pacific region, only five national surveys were available (table 1). The two most recent surveys show a small proportion of men who had paid for sex. The surveys from the early 1990s are from different countries and give a higher estimate. Most recent studies in Thailand have shown a dramatic decline of the proportion of men reporting sex with female sex workers (table 3). Data from published studies and BSS suggest prevalence is higher among risk groups (table 3). Men with high mobility occupations such as migrant workers, police, military, drivers and truckers disclosed a median proportion of contacts with sex workers of 30%, ranging from 6% to 62%. Around 25% of men report having sex with men (MSM) and injecting drug users (IDUs) also report sexual contact with sex workers, ranging from 20 to 40%. Fifteen per cent of other categories such as factory workers, students, and youth in slums report

Table 1 Proportion of men reporting commercial sex in the last 12 months†

Survey	Prevalence (%) of clients of FSW	Urban:rural ratio *p<0.05	Source
W Africa			
Benin 1996 DHS†	19.3	0.8	DHS
Benin 2001 DHS*	0.5	1.1	DHS
Burkina Faso 1999 DHS	9.1	1.0	DHS
Burkina Faso 2003 DHS*(3)	0.2	19.7*	DHS
Côte d'Ivoire 1998 DHS	5.0	1.0	DHS
Ghana 2003 DHS*	1.6	0.6	DHS
Guinea 1999 DHS	4.7	0.8	DHS
Guinea-Bissau 1990 GPA	8.6		GPA
Mali 1996 DHS	8.9	2.5*	DHS
Mali 2001 DHS*	0.2	29.8*	DHS
Niger 1998 DHS	9.7	1.2	DHS
Nigeria 1999 DHS	9.7	1.1	DHS
Nigeria 2003 DHS*	3.0	0.6	DHS
Togo 1998 DHS	5.7	1.3	DHS
<i>Median</i>		1.1	
Central Africa			
CAR 1989 GPA	12.8		GPA
CAR 1994 DHS	10.9	1.2	DHS
Cameroon 1998 DHS	21.0	0.9	DHS
Cameroon 2004 DHS*	0.7	3.4*	DHS
Chad 1997 DHS	13.6	2.3*	DHS
Chad 2004 DHS*	1.6	3.1*	DHS
Congo 1999 PSI	14.8		PSI
Gabon 2000 DHS*	9.8	1.0	DHS
<i>Median</i>		2.2	
E Africa			
Eritrea 1995 DHS	3.0	2.5	DHS
Ethiopia 2000 DHS*	0.0		DHS
Kenya 1990 GPA	9.8		GPA
Kenya 1998 DHS	11.9	1.5*	DHS
Kenya 2003 DHS*	2.9	1.9*	DHS
Rwanda 2000 DHS*	0.8	7.2*	DHS
Tanzania 1990 GPA	8.6		GPA
Tanzania 2004 DHS*	1.5	1.3	DHS
Uganda 1995 DHS	26.2	1.4*	DHS
Uganda 2000 DHS*	1.5	1.5	DHS
<i>Median</i>		1.9	
S Africa			
Botswana 2001 AIDS impact*(1)	2.0		AIDS impact
Lesotho 1989 GPA	14.9		GPA
Lesotho 2004 DHS*	1.7	3.4	DHS
Malawi 1996 DHS	7.8	1.0	DHS
Malawi 2000 DHS*	8.3	1.3	DHS
Mozambique 2003 DHS*	13.2	0.9	DHS
Namibia 2000 DHS*	1.6	1.3	DHS
Zambia 1996 DHS	22.9	0.9	DHS
Zambia 2002 DHS*	10.6	1.2	DHS
Zimbabwe 1994 DHS	5.4	1.1	DHS
Zimbabwe 1999 DHS*	7.0	1.4	DHS
<i>Median</i>		1.3	
S & SE Asia			
Nepal 2002 DHS*(2)	0.4	0.6	DHS
Philippines 2003 DHS*	2.1	1.9*	DHS
Singapore 1989 GPA	7.6		GPA
Sri Lanka 1991 GPA	1.2		GPA
Thailand 1990 GPA	23.4		GPA
<i>Median</i>		-	
Latin America & Caribbean			
Bolivia 2003 DHS*	2.5	2.1*	DHS
Brazil 1996 DHS*(3)	0.2	0.3	DHS
Chile 1998 NAT*(4)	1.0		NAT
Dominican Republic 1996 DHS	11.6	0.7*	DHS
Dominican Republic 2002 DHS*(3)	8.0	0.7	DHS
Haiti 1994 DHS	6.8	0.6*	DHS
Haiti 2000 DHS*	5.9	0.6*	DHS
Honduras 1996 RHS*	4.9		RHS
Peru 1996 DHS	4.6	1.2	DHS
<i>Median</i>		0.7	
E Europe & Central Asia			
Armenia 2000 DHS*	2.4	3.4*	DHS
Kazakhstan 1999 DHS*	1.4	0.7	DHS
Uzbekistan 2002 DHS*	3.2	1.5	DHS
<i>Median</i>		1.5	
High income countries			
Australia 2002 ASHR*	1.8		ASHR
France 1992 NAT*(4)	1.1		NAT
France 1998 NEM*	0.7	1.2	NEM
Germany 1990 NAT*West (4)	4.8		NAT

Table 1 Continued

Survey	Prevalence (%) of clients of FSW	Urban:rural ratio *p<0.05	Source
Germany 1998 NEM*	0.0		NEM
Greece 1998 NEM*	5.3	0.4	NEM
Italy 1992 NAT*(4)	2.0		NAT
Italy 1998 NEM*	1.7		NEM
Netherlands 1989 NAT*(4)	2.8		NAT
Norway 1992 NAT*(4)	1.8		NAT
Norway 1997 NEM*	1.7		NEM
Portugal 1991 NAT*(4)	5.4		NAT
Portugal 1999 NEM*	2.4		NEM
Spain 1990 NAT*(4)	11.0		NAT
Switzerland 1992 NAT*(4)	3.7		NAT
Switzerland 1997 NEM*	3.4		NEM
UK 1990 NAT*	2.0		NAT
UK 1998 NEM*	1.0		NEM
Median		-	
City based surveys			
Athens, Greece, 1990	6.0		NAT
Colonou*, Benin, 1998	6.5		Multisite
Dakar*, Senegal, 1997	4.5		Multisite
Kisumu*, Kenya, 1998	8.7		Multisite
Ndola*, Zambia, 1998	14.0		Multisite
Yaounde*, Cameroon, 1998	15.5		Multisite
Ouagadougou*, Burkina, 2002	12.2		Multisite
Manila, Philippines, 1990	5.8		GPA
Rio de Janeiro, Brazil, 1991	6.5		GPA

†Defined as all men 15–49 years old who reported giving money, gifts, or favours in return for sex, in the last 12 months; except countries with * where definition is "paid sex"; + aged 20–49.

(1) Sample only includes respondents with a non-regular partner; (2) sample only includes ever married men; (3) of last three partners, at least one was a sex worker; (4) sample includes sexually active only and age group is 18–49, except Chile (20–69) Switzerland (18–45).

sex worker contact in the last 12 months, with ranges from 7% to 30%.

From the few local surveys with samples drawn among men in households, national estimates can be inferred: China, Hong Kong, 11%; Vietnam, 3%; Indonesia, 3%; Philippines, Manila, 3–6%; Myanmar, 7%; Cambodia, 5–10%; Northern Thailand students, 7%. In South Asia, the few available studies suggest a median estimate of 3–5%. No representative study of the Pacific islands was found.

In the Caribbean, with only two national surveys in Haiti and two in the Dominican Republic, it is difficult to calculate an estimate for the region. Using the two most recent surveys (2000 and 2002), the median rate of commercial sex among men can be estimated at around 6–7%. A recent review of the grey literature in the Caribbean region confirms this estimate.³⁷ In a BSS survey conducted in two cities in Haiti in 2000, 6% of young men reported paid sex in the last 12 months.²¹

The same precaution regarding the limited number of surveys applies to Latin America where only five national surveys were carried out with specific questions to men about commercial sex. The median estimate is 2.5% (1–4.6) and the mean is 2.6%. As in other regions, truck drivers and high mobility groups exhibit higher risk behaviour: for example in 2003, in Santos, Brazil, 21% of 300 truck drivers reported paid sex in the last six months.³⁸

In Western Europe, surveys conducted in the early nineties in nine countries show that the median value of reported contact with a sex worker was 2.9% (1.9–5.5) with a mean of 3.6% and estimates from the later surveys are similar. In other high income countries, prevalence is similar to Western Europe. In the USA, where prostitution is illegal in most states, men's reports of paying for sex indicated in 1998 that 0.6% of men reported sex with a sex worker during the last year,³⁹ and another survey in 1990 indicated 5.9% reported sex with a sex worker within the last five years.⁴⁰ Australian men were similar, with one in six reporting ever paid for sex but only 1.8% of men reporting doing so in the last year.⁴¹ In Eastern Europe and Central Asia 2.4%, 1.4, and 3.2% of men in the countries of Armenia, Kazakhstan, and Uzbekistan, respectively, reported paid sex in the last 12 months with a median of 2–3%. In St Petersburg, Russia 7% of adult men reported sex worker contacts.⁴² In Northern Africa and the Middle East, there are not enough published data for building a regional estimate.

Urban/rural distribution

Disaggregation of data on commercial sex by urban and rural areas for 49 national surveys where data were available (table 1) indicates that in 13 surveys commercial sex was significantly more prevalent among men from urban areas

Table 2 African subregional estimates of the proportion of men reporting sex worker contacts in the last 12 months, using two definitions of commercial sex

	Sex in exchange for money gifts of favours				Paid someone for sex			
	Median	Mean	Surveys (n)	Median year	Median	Mean	Surveys (n)	Median year
Western Africa	8.9	8.9	7	1998	0.5	1.1	5	2003
Central Africa	13.6	15.2	3	1997	1.6	4.0	3	2004
Eastern Africa	19.0	19.0	2	1995	1.5	1.4	5	2000
Southern Africa	7.8	12.0	3	1995	8.3	8.1	5	2001

Table 3 Men reporting sex with a female sex worker, for selected male groups, in Asia

Country, sites	Occupation	Age (years)	% Men reporting paid sex, year	Data source
Bangladesh, Chittagong	Unmarried adults		20%, 1997	(24)
Bangladesh, Dhaka	Truck drivers		54%, 2003	(25)
Thailand, North	Married men		13%, 1997	(1)
Thailand, Nakhonsawan	Adult men	32	15.8%, 2001	(26)
Thailand, Bangkok	Factory workers	22	61%, 1993	(27)
			33%, 1996	
Thailand, Bangkok	Vocational students	18	22%, 1993	(27)
			14%, 1996	
Thailand, Bangkok	STD clinic attendees	31	13%, 1993	(27)
			5%, 1996	
Thailand, North, 6 provinces	Military conscripts	21	57.1%, 1991	(28)
			8.6%, 1998	
Philippines, selected cities	Single men	15–24	3.0%, 1994	(29)
	Ever married	15–24	1.7%, 1994	(29)
Philippines, selected cities	Men in health facilities		6.0%, 2002	(30)
Vietnam, one province	Adults	15–45	3.0%, 2001	(31)
Vietnam, 5 cities	Truck drivers	30+	27%–33%, 2000	BSS
Vietnam, 3 cities	IDU	28	6%–23%, 2000	BSS
Vietnam, 2 cities	Migrant workers		7%–16% 2000	BSS
Indonesia, selected sites	Adults		3%, 2000	(32)
Indonesia, 3 cities	IDUs	23	21%–25%, 2003	(33)
Lao	Truck drivers		31%, 2001	BSS
Lao	Police		24%, 2001	BSS
Lao	Military		12%, 2001	BSS
Lao	Migrant workers		6%, 2001	BSS
China, Hong Kong	Adult men	18–60	14%, 2001	(34)
China, Hong Kong	Adult men	18–60	10.8–14%, 1998–2001	(35)
Cambodia, 4 provinces	Men and youths		5%–10%, 2005	(36)
Cambodia, 5 provinces	Motodriver [*]		42.0%, 1997	BSS
			59.0%, 1999	
	Military		62.0%, 1999	BSS
	Police		61.0%, 1999	BSS
Myanmar	Adult men		7.0%, 2003	(36)
India, Tamil-Nadu	Truckers and helpers		38.0%, 1996	BSS
			17.0%, 2001	BSS
India, Tamil-Nadu	Factory workers	18–35	7.0%, 1996	BSS
			5.0%, 2001	BSS
India, Tamil Nadu	Youth in slums	15–24	8.0%, 2001	BSS
India, Pondichery	MSM	adults	16.0%, 2001	BSS
	Truckers and helpers		20.0%, 2001	BSS
	Factory workers	18–35	9.0%, 2001	BSS
	Youths in slums	15–25	12.0%, 2001	BSS
	Students	25	3.0%, 2001	BSS
India, 5 cities	MSM		36.0%, 2002	BSS
India, 5 cities	IDUs		16.0%, 2002	BSS
Indonesia, 3 cities	High risk workers		27.0%, 1996	BSS
Indonesia, 3 cities	High risk workers		47.0%, 2000	BSS
Indonesia, 3 cities	IDUs		40.0%, 2002	BSS

*Motorcycle taxi drivers.

than men from rural areas and that the reverse was true in three surveys and in the remainder there was little difference. The regional median urban to rural ratio is 1:1 in West Africa, 2:2 in Central Africa and 1:9 in Eastern, and 1:3 in Southern Africa. In Latin America, the median ratio is 0:7.

The city survey results in Cotonou, Kisumu, and Yaoundé are lower than national figures collected using DHS design: 6.5% versus 17.2%; 8.7% versus 11.9%, and 15.5% versus 19.6%, respectively. However, DHS used the extended definition of sex worker's contact as compared to percentages of paid sex in the cities studies, which may explain these differences. In Dakar, Ouagadougou, and Rio de Janeiro, results are higher in cities as compared to rural areas.

Age group distribution

In sub-Saharan Africa, among men, the peak prevalence of sex worker contacts is generally among the age group 20–24, followed by a decline in older age groups (online table A; see <http://www.stijournal.com/supplemental>). The median ratio of 15–24 to 25–49 year olds who report sex work contacts/transactional sex is 1:2, 1:1, 1, and 1:3 in West, Central, Eastern, and Southern Africa, respectively. A few countries

seem to display different patterns such as Gabon, Zimbabwe, and Cote d'Ivoire with ratios below 0.5.

In South and South East Asia and Latin America, the peak prevalence of sex worker contacts is also among the age group 20–24 followed by a slow decline in older age groups, except in Singapore—where age at first sex is very high—and Haiti. In Western Europe, the median ratio of 15–24 to 25–29 is 1.

Trends over time

In 14 countries, DHS have been repeated, potentially allowing comparisons over time. However, in all countries there was a change from the broad question “Did you give money, gifts or favour in exchange of sex, in the last 12 months” in the first survey to “paid sex” or “sex with a sex worker” in the later one. In all the African countries, except Malawi, there has been a substantial decline between the two surveys in the prevalence of men reporting contact with sex worker. The changes in definition make interpretation of the decrease difficult. In Haiti and the Dominican Republic, there is little change between the two surveys, despite the change in definition.

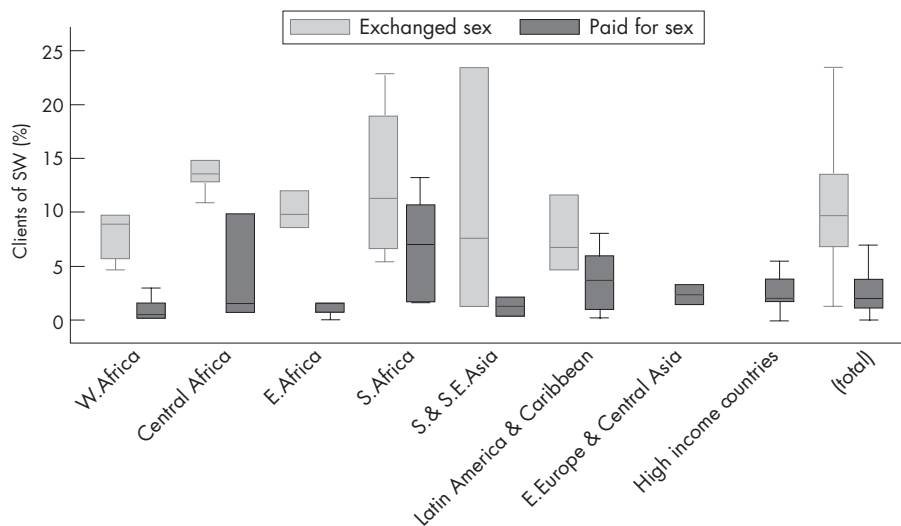


Figure 1 Median proportion of men reporting commercial sex in the last 12 months, by region. Box indicates 75th and 25th percentiles; line denotes median and whiskers show interquartile range. (Based on general population based surveys; does not include BSS surveys of special population groups.)

In two African and six European countries there are also estimates from different time points. There were no strong trends evident in five European countries or in the Central African Republic. In Lesotho, there is a decline in prevalence from 15% in 1989 to 2% in 2004. In Britain, between 1990 and 2000, there was a significant increase in the proportion of men reporting paid sex in the last five years, from 2.0% to 4.3%.⁴³

Regional estimates

Using general population based survey data reviewed above, a range of percentages of men reporting sex in exchange of money, or paid sex, in the last 12 months was estimated for eight regions and subregions. Subregional estimates are given for the extended definition of "money, gifts or favours in exchange of sex" and for "paid sex" when available. The range of regional estimates varies from a minimum of 1% to a maximum of 14% (fig 1). The median percentage of men who exchange sex for money in the last 12 months in all regions was around 9–10%, with estimates from 13% to 15% in Central African region, 10 to 11% in Eastern and Southern Africa, and 5–7% in Asia and Latin America. Estimates for men who paid sex were much lower at around 2–3% with ranges from 7% in the South African region to 1% in Asia and West Africa.

DISCUSSION

Heterosexual commercial sex is one of the major drivers of the HIV epidemic around the world. Using data from national household surveys, from BSS and research studies, this review estimates that in the past 20 years between 1% and 14% of men in different regions have purchased sex from a female sex worker in the course of a year. Although these estimates are potentially biased, they begin to address a severe dearth of strategic information. Indeed, estimating the number of clients of sex workers is critically important for planning and programming, as well as estimating the number of people infected with HIV, particularly outside of Africa.¹⁶

It is generally recognised that commercial sex is more prevalent in urban than in rural areas.^{5 17 44} Notably, possible reasons for a higher concentration of commercial sex in cities include, among others, a disproportionate number of male migrants searching for job. Cities also concentrate groups with higher income, allow for more anonymity, and generally exhibit more liberal social norms. Increased education and some occupational categories more common in cities are also

significant predictors of sex workers' contacts.⁴⁵ However, as shown by results in West Africa and in Latin America, rural areas also include highly mobile male population groups working on commercial farms and mines. A recent study in rural Zimbabwe has shown that among male workers, 29% reported sexual contact with a sex worker in the last 12 months.⁶ A substantial proportion of commercial sex use by men living in rural areas may occur in urban areas: in Cotonou, Yaoundé, Kisumu, and Ndola female sex workers estimated that between 9% and 24% of their clients were not city resident.¹⁵

In sub-Saharan Africa, the ratio of 15–24 to 25–49 year olds who report sex work contacts or transactional sex is largely above 1 and the peak prevalence of commercial sex is in the age group 20–24. The explanation for this trend is straightforward—in the age group 15–19, many young men are not yet sexually active. Above the age of 20–24, many young men are married and have less commercial or transactional sex. In regions other than sub-Saharan Africa, a high prevalence of reported use of commercial sex is found in the age group 20–24 but contacts with sex workers continue at the same levels at older ages. Previous studies have also shown that commercial sex is higher among formerly and never married men than among those married or with regular partners.^{17 44}

In this review, the results of national probability household surveys were chosen as the preferred method to obtain the national estimate of the prevalence of commercial sex use among men. Indeed, the probability sample may allow results of the survey to be generalised to the entire population. However, validity studies have shown that questions on sexual behaviour suffer from various biases including memory and social desirability biases.^{46 47} Because of the stigma attached to sexual contacts with sex workers, or because very casual contacts may not be remembered, men may be underreporting their number of paid sex partners: either by not reporting partners who were sex workers or reporting them as falling in another category, such as casual dates or acquaintances. The African city studies found strong evidence of underreporting of contact with sex workers by men.^{15 47} Various techniques such as audio computer assisted self-interviews and self-administered questionnaires have been used with various successes to provide greater privacy for those surveyed than face-to-face interviews, and therefore elicit more reliable reporting of stigmatised behaviours.⁴⁶ In the African countries where two different definitions of sex worker contact have been used in two DHS, the dramatic drop in the proportion of men reporting contact with a sex

worker is probably partly due to a change in propensity to report this behaviour.

Few national probability surveys were available outside Africa and some high income countries, making it difficult to estimate the number of clients of sex workers for all regions. Survey data were thus complemented by results of behavioural surveillance surveys and small scale studies conducted among population groups with high risk behaviours. A high proportion of men with high mobility occupations reported sex with sex workers. Other population groups, such as students, out of school youth, or factory workers reported frequencies of contact with sex workers much closer to "general population" reporting, (when a comparison was possible, such as in Haiti or Nepal). Because BSS are only conducted among specific groups and geographical locations, the denominator—when available—cannot easily be used to estimate sex workers' contacts at national or city level, although multiplier methods can be used.¹⁶ The results of these surveys may provide better estimates of the scope of paid sex in several specific groups. Indeed, it has been argued that men in BSS studies report commercial sex more accurately than men approached in national surveys.¹⁶ It should also be noted that household based surveys do not include military barracks or workers' hostels or specific locations where single men with high risk behaviour might live. Population subgroups in BSS are nearly by definition more sexually active, younger, and more urban than the general population in national household data.

Although the characteristics of high risk groups are important for HIV prevention programmes and for the dynamics of HIV transmission, at population level the sizes of these risk groups may not be large enough to represent more than a few percentage points of the general population. Data among young people in Asia and in Latin America showing high rates of contacts with sex workers may also reflect specific behaviours associated with first few partners and may decrease substantially after marriage. Thus, extrapolations from the results of a few subpopulation or local studies in order to develop national estimates could well be wrong, especially if sex work is heavily concentrated in urban centres or if contacts with sex workers are associated with particular age groups or occupational groups.

Whether in BSS or in national probability surveys, under-reporting varies over time and in particular may reflect the intensity of HIV prevention programmes. In countries with strong prevention programmes, the social desirability bias may affect the willingness of respondents to report on "risky" and disapproved behaviours. For example, recent surveys in Rwanda and Uganda show that less than 2% of men reported contacts with sex workers, a figure 10 times lower than that reported in earlier surveys conducted in the nineties. It is thus difficult to separate the social desirability bias from real change in behaviours due to intensive HIV/AIDS education programmes

One of the most difficult issues for the interpretation of survey data is related to the definition of sex worker. In many contexts in sub-Saharan Africa, identification of "sex worker sexual contact" on the basis of paid sex is often unrealistic because sex is exchanged for money or goods by a wide range of men and women, irrespective of employment or union status. Therefore, it is difficult to enforce a clear cut distinction between contacts with sex workers and transactional sex with other non-regular sexual contacts.

As more than half of the population surveys in sub-Saharan Africa during the 1990s used a consistent definition of sex work as "sex in exchange of money, gifts or favours, in the last 12 months", the variations in the median frequencies of sex work contacts in this subregion are likely to reflect a real difference across Africa. However, this cannot be easily

compared to other regions, where a restricted definition of paid sex is used. Indeed, in other regions, the definition of sex worker contact is more straightforward and paying for sex usually involves commercial sex with sex workers. In these regions, clients of female sex workers have been shown to disproportionately belong to specific occupational groups. Hence, this is justification to sample these groups of men in these subregions, as is done in many behavioural surveillance surveys.

More than 60% of the national or city based surveys used for this review were carried out in the 1990s. The estimates provided here reflect the past situation and may no longer be valid. Indeed, commercial sex behaviour by men is amenable to change as shown by survey data in Thailand, Uganda, and Rwanda. However, in contrast, in the last decade no changes have been observed in the Dominican Republic or Haiti. Structural factors such as rapid urban growth and/or economic deterioration or inequalities, in addition to increased HIV/AIDS awareness, clearly affect the demand and the offer of commercial sex. Declines in the rate of bacterial sexually transmitted infections among men attending health facilities, traditionally associated with client/sex worker interactions, have been reported in some African countries where sex workers programmes are implemented^{7 10 48} and these declines are consistent with changes in risk behaviour. Dramatic increases in STIs have been reported in other regions such as China or Russia⁴⁹ and anecdotal evidence suggests that there is also an increase in commercial sex. In most parts of Asia (except Thailand and Cambodia), where declines in STIs among core groups have been found, study results tend to show that increased condom use among sex workers and clients was the most likely explanation for the changes, and not just the decline in sex workers' contacts.^{36 50 51}

The data collected in this paper show that differences in survey methodology yield very different estimates of the prevalence of contact with sex worker. Changes over time can be tracked more accurately with consistent survey methods.

For many regions of the world, the lack of surveys of the general population is a major impediment for any documented estimation of the prevalence of clients of sex workers on a national and regional basis. In this absence, data were supplied by recent research studies that could provide some evidence that aided in establishing national estimates or inferring regional estimates. The authors recognise that the representativeness of these data were often questionable and that to compare the range of percentages of one single indicator (such as commercial sex prevalence) across all regions should be seen as a first attempt to convince national HIV control programmes to improve their national estimates.

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REFERENCES

- 1 **Maticka-Tyndale E**, Elkins D, Haswell-Elkins M, *et al*. Context and patterns of men's commercial sexual partnerships in Northeastern Thailand: Implications for AIDS prevention. *Soc Sci Med* 1997;**44**:199-213.
- 2 **Collumbien M**, Das B, Bohidar N. Male sexual debut in Orissa, India: context, partners and differentials. *Asia Pac Popul J* 2001;**16**:211-22.
- 3 **Lowndes CM**, Alary M, Meda H, *et al*. Role of core and bridging groups in the transmission dynamics of HIV and STIs in Cotonou, Benin, West Africa. *Sex Transm Infect* 2002;**78**(Suppl 1):69-77.
- 4 **Voeten H**, Egeseh OB, Ondiege M, *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.
- 5 **Van De Perre P**, Clumeck N, Caraël M, *et al*. Female prostitutes: a risk group for infection with HTLV-III. *Lancet* 1985;**8454**:524-7.

- 6 **Cowan FM**, Langhaug LF, Hargrove JW, *et al.* Is sexual contact with sex workers important in driving the HIV epidemic among men in rural Zimbabwe? *J Acquir Immune Defic Syndr* 2005;**40**:371–6.
- 7 **Ghys PD**, Diallo MO, Etiegne-Traore V, *et al.* Increase in condom use and decline in HIV and sexually transmitted diseases among female sex workers in Abidjan, Cote d'Ivoire, 1991–1998. *AIDS* 2002;**16**:251–68.
- 8 **Hanenberg RS**, Rojanapithayakorn W, Kunasol P, *et al.* Impact of Thailand's HIV-control programme as indicated by the decline of sexually transmitted diseases. *Lancet* 1994;**344**:243–5.
- 9 **Sopheab 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.
- 10 **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.
- 11 **Morris M**, Podhisita C, Wawer MJ, *et al.* Bridge populations in the spread of HIV/AIDS in Thailand. *AIDS* 1996;**10**:1265–71.
- 12 **Pickering H**, Todd J, Dunn D, *et al.* Prostitutes and their clients: a Gambian survey. *Soc Sci Med* 1992;**34**:75–88.
- 13 **Vuytsteke BL**, Ghys P, Traore M, *et al.* HIV prevalence and risk behavior among clients of female sex workers in Abidjan, Cote d'Ivoire. *AIDS* 2003;**17**:1691–4.
- 14 **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;**8**:444–52.
- 15 **Morison L**, Weiss HA, Buve A, *et al.* Commercial sex and the spread of HIV in four cities in sub-Saharan Africa. *AIDS* 2001;**15**(Suppl 4):S61–69.
- 16 **UNAIDS/WHO/FHI.** *Estimating the size of populations at risk for HIV*, Updated July 2003. Geneva: World Health Organization, 2003.
- 17 **Carael M**, Cleland J, Adekun L, *et al.* Overview and selected findings of sexual behaviours surveys. *AIDS* 1991;**1**(Special Issue on Africa):S65–S73.
- 18 **HIV/AIDS Survey Indicators Database.** Available at <http://www.measuredhs.com/hivdata/> (accessed March 2006).
- 19 In: **Hubert M**, Bajos N, Sandfort T, eds. *Sexual behaviour and HIV/AIDS in Europe: comparisons of national surveys* UCL Press, 1998.
- 20 **EU New Encounter Module Project.** Available at http://centres.fusl.ac.be/CES/document/SIDA_AC2/EN/rechsida.AC21.html (accessed March 2006).
- 21 **Family Health International.** Available at <http://www.fhi.org/en/HIVAIDS/pub/survreports/index.htm> (accessed March 2006).
- 22 In: **Carael M**, Holmes KK, eds. *Dynamics of HIV epidemics in sub-Saharan Africa: introduction.* *AIDS* 2001;**15**(Suppl 4):S1–4.
- 23 **UNAIDS/WHO.** *AIDS epidemic update*, Special report on HIV prevention. Geneva: World Health Organization, 2005.
- 24 **Caldwell B**, Pieris I, Barkat-e-Khuda, *et al.* Sexual regimes and sexual networking: the risk of an HIV/AIDS epidemic in Bangladesh. *Soc Sci Med* 1999;**48**:1103–16.
- 25 **Gibney L**, Saquib N, Metyger J. Behavioural risk factors for STD/HIV transmission in Bangladesh's trucking industry. *Soc Sci Med* 2003;**56**:1411–24.
- 26 **Lertpiriyasuwat C**, Plipat T, Jenkins RA. A survey of sexual risk behaviour for HIV infection in Nakhonsawan, Thailand 2001. *AIDS* 2003;**17**:1969–76.
- 27 **Mills S**, Benjarattanaporn P, Bennett A, *et al.* HIV risk behavioral surveillance in Bangkok, Thailand: sexual behavior trends among eighth population groups. *AIDS* 1997;**11**(Suppl 1):43–51.
- 28 **Nelson KE**, Eiumtrakul S, Celantano DD, *et al.* HIV infection in young men in Northern Thailand, 1991–98: increasing role of injection drug use. *J Acquir Immune Defic Syndr* 2002;**29**:62–8.
- 29 In: **Raimundo C**, Xenos P, Domingo LJ, eds. *Adolescent sexuality in the Philippines*. Manila: University of the Philippines, 1999.
- 30 **Wi T**, Saniel O. *RTI/STD prevalence in selected sites in the Philippines*. Manila: Department of Health and Family Health International, 2002.
- 31 **Bui TD**, Pham CK, Pham TH, *et al.* Cross-sectional study of sexual behavior and knowledge about HIV among urban, rural, and minority resident in Viet Nam. *Bull World Health Organ* 2001;**79**:15–21.
- 32 **Riono P.** *Sexual networking among men and STD/HIV epidemic in Indonesia*. Public Health. Los Angeles: University of California, 2001.
- 33 **Pisani E**, Dadun, Sucaya PK, *et al.* Sexual behaviour among injection drug users in 3 Indonesian cities carries a high potential for HIV spread to non injectors. *J Acquir Immune Defic Syndr* 2003;**4**:403–6.
- 34 **Lau JT**, Siah PC. Behavioral surveillance of sexually-related risk behaviors: the Chinese male general population in Hong Kong: a benchmark study. *AIDS Care* 2001;**13**:221–32.
- 35 **Lau JT**, Tsuy HY. Behavioural surveillance surveys of male clients of female sex workers in Hong Kong: results of three population based surveys. *Sex Transm Dis* 2003;**30**:620–8.
- 36 **Sopheab H**, Fylkesnes K, Yun MC, *et al.* HIV-related risk behaviors in Cambodia and effects of mobility. *J Acquir Immune Defic Syndr* 2006;**41**:81–6.
- 37 **UNAIDS and Ministry of Health Jamaica.** *Stengthening the Caribbean regional response to the HIV epidemic*, Report of the Caribbean technical working group meeting on HIV prevention and gender. Jamaica, 2004.
- 38 **Lacerda R**, Gravato N, McFarland W, *et al.* Truck drivers in Brazil: prevalence of HIV and other sexually transmitted diseases, risk behavior and potential for spread of infection. *AIDS* 1997;**11**(Suppl 1):S15–19.
- 39 **US General Social Survey, quoted in Smith TW.** American sexual behavior: trends, socio-demographic differences and risk behaviors. National Opinion Research Center, University of Chicago GSS Topical Report No 25, 1998.
- 40 **Wells JA**, Sell RL. *Project HOPE's International Survey of AIDS Educational Messages and Behavior Change: France, the United Kingdom and the United States*. Chevy Chase, MD: Project HOPE, 1990.
- 41 **Rissel CE**, Richters J, Grulich AE, *et al.* Sex in Australia: Experiences of commercial sex in a representative sample of adults. *Aust N Z J Public Health* 2003;**27**:191–7.
- 42 **Amirkhanian YA**, Kelly JA, Issayev DD. AIDS knowledge, attitudes and behaviour in Russia: results of a population-based, random-digit telephone survey in St Petersburg. *Int J STD AIDS* 2001;**12**:50–7.
- 43 **Johnson AM**, Mercer CH, Erens B, *et al.* Sexual behavior in Britain: partnerships, practices and HIV risk behaviors. *Lancet* 2001;**358**:1835–42.
- 44 **Carael M.** Urban-rural differentials in HIV/STD and sexual behaviour. In: Herdt G, ed. *Sexual cultures and migration in the era of AIDS*. Oxford: Oxford University Press, 1997:107–26.
- 45 **Deheneffe JC**, Carael M, Noubissi A. Socio-economic determinants of sexual behaviour and condom use. In: Ainsworth M, Franssen L, Over M, eds. *Confronting AIDS: evidence from the developing world* The World Bank, 1998:131–46.
- 46 In: **Cleland J**, Boerma JT, Carael M, *et al.* Measurement of sexual behavior. *Sex Transm Infect* 2004;**80**(Suppl 1):ii1–ii90.
- 47 **Carael M**, Glynn R, Lagarde E, *et al.* Sexual networks and HIV in four African populations: the use of a standardised behavioural survey with biological markers. In: Morris M, ed. *Network epidemiology: a handbook for network survey design and data collection*. Oxford: Oxford University Press, 2004.
- 48 **Nagot N**, Meda N, Ouangre A. Review of STI and HIV epidemiological data from 1990 to 2001 in urban Burkina-Faso: implications for STI and HIV control. *Sex Transm Inf* 2004;**80**:124–9.
- 49 **UNAIDS.** 2004 report on the global AIDS epidemic. Geneva, 2004.
- 50 **Ruxrungtham K**, Brown T, Phanuphak P. HIV/AIDS in Asia. *Lancet* 2004;**364**:69–82.