

Sexually transmitted infections :
occupational diseases in sex
workers ?
A systematic review

Professor emeritus Antoon De Schryver

Universiteit Antwerpen/IDEWE

Sexually transmitted infections : occupational diseases in sex workers ?

- Definition of sex work
- Main STI pathogens
- Burden of STI in sex workers (SW)
- Research question
- Methods – literature search strategy
- Results : prevalence of STI in SW
 - Female SW
 - Male SW
 - Transgender SW
- Discussion
- Conclusions/prevention

Sexually transmitted infections : occupational diseases in sex workers ?

- Sex work spans a wide range of activities, but is here defined as the provision of sexual services in exchange of money and goods (Johnson et al; 2023).
- Sex workers (SWs) are a heterogeneous population
- Extensive variability in structural, economical , social and legal context in which they work
- In view of the recent decriminalisation of sex work, there is the question of specific occupational risk and social protection

Sexually transmitted infections : occupational diseases in sex workers ?

- Sex workers : female, male, trans and gender diverse adults (≥ 18 yrs)
- Exchange of money or goods for sexual services (regularly or occasionally), in principle consensual
- Stigma, discrimination and punitive legal and social environments
- Greater risk for poor mental health, social exclusion, violence (homicide)

List of main sexually transmitted pathogens (Unemo; 2013)(1)

- **Bacterial infections**

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- *Chlamydia trachomatis* (serovars L1-L3)
- *Treponema pallidum*
- *Haemophilus ducreyi*
- *Klebsiella* (*Calymmatobacterium granulomatis*)
- *Mycoplasma genitalium*

List of main sexually transmitted pathogens (Unemo; 2013) (2)

- **Viral infections**

- Human immunodeficiency virus (HIV)
- Herpes simplex virus type 2
- Herpes simplex virus type 1
- Human Papilloma virus (HPV)
- Hepatitis B virus
- Cytomegalovirus
- Molluscum contagiosum virus
- Kaposi sarcoma associated herpesvirus (human herpesvirus type 8)

List of main sexually transmitted pathogens (Unemo; 2013) (3)

- **Protozoal infections**
 - *Trichomonas vaginalis*
- **Fungal infections**
 - *Candida albicans*
- **Parasitic infestations**
 - *Phthirus pubis*
 - *Sarcoptes scabiei*

List of selected sexually transmitted pathogens (WHO & Sciensano consensus)

- *Neisseria gonorrhoeae*
- *Chlamydia trachomatis*
- *Treponema pallidum*
- *Haemophilus ducreyi*
- *Mycoplasma genitalium*
- Human immunodeficiency virus (HIV)
- Herpes simplex virus
- Human Papilloma virus (HPV)
- Hepatitis B virus
- Hepatitis C virus
- *Trichomonas vaginalis*

Burden of STI in sex workers globally

- WHO : Sex workers face increased burden of STI and blood-borne infections
- Globally, sex workers are 30 times more likely to have HIV than the general population (UNAIDS)
- Mean global prevalence of selected STIs in SWs (WHO 2022):
 - HIV : 36%
 - Syphilis : 10.8% (5.8 – 30.3)
 - Other STIs (including Hep B) : limited info

Research question(s)

- Sex workers face increased burden of STI and blood-borne infections (STBBIs)
- Within the Belgian framework of specific work-related risks and social protection, including possible compensation and prevention, there is a need for detailed and concrete data on prevalence of STIs in sex workers compared to the general population in Belgium and/or comparable high-income countries

=>Research questions :

- (1) what is the prevalence of STIs in sex workers in high-income countries compared to the general population ?
- (2) For which STI the relative risk (RR) was ≥ 4

Search strategy

- Topic already explored in a recent systematic review of infectious disease risk associated with occupational exposure among non-health care workers by Acke et al (Acke et al; 2020)
- Extensive electronic search strategy in Medline, Ovid, Embase and Cochrane Central for period Jan 1 2009 – December 8, 2020 => 13 studies on SWs from high-income countries
- In addition PubMed search was done for period December 9, 2020-March 1, 2023 => 20 studies on SWs from high-income countries
- => data extracted from 33 studies (13+20)

Relative risk compared with general population

- Most studies do not include prevalence from the general population (GP)
- Sources of comparison data :
 - UNAIDS on HIV in GP data available for most countries
 - WHO prevalence estimates for high income countries :
chlamydia, gonorrhoea, trichomoniasis and syphilis

WHO prevalence estimates in % of chlamydia, gonorrhoea, trichomoniasis and syphilis in high income countries in the general population aged 15-49 yrs

	Women	Men
Chlamydia	3.0	2.0
Gonorrhoea	0.4	0.3
Trichomoniasis	2.3	0.7
Syphilis	0.1	0.1

Prevalence of STI in SW compared with the
GP :
results

Prevalence of HIV in female sex workers compared with general population (15 studies)

Location	Prevalence (in %)	Prevalence in general population	Prevalence UNAIDS data
• Portugal	8.0	0.1	0.5
• Baltimore (USA)	5.2	NA	0.5
• Baltimore (USA)	5.0	NA	0.5
• Verona (Italy)	4.6	0.4	0.2
• Moscow (Russia)	3.9	1	NA
• A'dam, R'dam, The Hague (Netherlands)	3.8	NA	0.2
• Catalonia (Spain)	3.0	NA	0.4
• Alicante (Spain)	2.9	0.3	0.4
• Rome (Italy)	1.2		0.2
• A'dam (Netherlands)	0.7	NA	0.2
• South Limburg (Netherlands)	0.4	NA	0.2
• Switzerland	0.4	0.0	0.2
• England (UK)	0.2	0.1	NA
• Melbourne (Australia)	0.02	NA	0.1
• Lausanne (Switzerland)	0.0	0.4	0.2

HIV in female sex workers

Discussion

- HIV : in 9/15 studies prevalence in FSW at least 4 times higher than general population
- Prevalence was low in places with high condom use and/or performing services (e.g. GUM clinics)
- Prevalence higher in “criminalized” places and southern Europe, remarkably low in western Europe (but still higher than in general population)

Prevalence of syphilis in female sex workers compared with the general population (11 studies)

Location	Prevalence (in %)	Prevalence in general population or OR*
• Moscow	14.0	0.2-1.1
• Switzerland	5.9	0.0
• Lausanne	5.2	< 0.02
• London	2.2	
• Verona	2.0	
• South Limburg	0.5	
• England	0.1	0.1
• Melbourne	0.07	
• Amsterdam	0.0	
• Rome	0.0	
• Japan		3.4* (2.0-5.9)
• WHO estimate		0.1

Syphilis in female sex workers

Discussion

- Syphilis : in 7/11 studies prevalence higher (RR > 4) than in general population (WHO estimate)
- Prevalence was low in places with high condom use, presence of performing services (e.g. GUM clinics), absence of criminalization

Prevalence of gonorrhoea and chlamydia in female sex workers compared with the general population (12 studies)

Location	Gonorrhoea (%)		Chlamydia (%)	
	In FSWs	In general population	In FSWs	In general population
• Amsterdam	0.7		8.9	
• Baltimore	15.8		18.2	
• Baltimore	12.6		10.5	
• Catalonia	0.5		1.8	
• England	2.7	1.0	10.4	8.5
• Lausanne (Switzerland)	0.0		6.3	6.0
• London	10.4		11.3	
• London	2.2		4.3	
• Melbourne (Australia)	0.24	0.57	4.2	7.9
• Moscow (Russia)	3.4	0.5- 2.2	9.6	3.0-6.6
• South Limburg	2.9		5.7	
• Switzerland	4.9	0.0	6.3	5.4
WHO estimates		0.4		3.0

Gonorrhoea & chlamydia in female sex workers discussion

- Gonorrhoea & chlamydia : prevalence 2 – 3 times general population
- Gonorrhoea : 8/12 studies RR > 4 / Chlamydia : 1/12 studies RR > 4
- Intriguing data from London: much higher prevalence when police enforcement occurs

Prevalence of HBV & HCV in female sex workers compared with general population(GP)

Location	HBV prevalence	(%) GP	HCV prevalence	(%) GP
England	0.6	0.1	0.2	0.04
Lausanne	4.2	0.3	0.0	NA
Switzerland	1.4	0.0	0.4	NA
Verona	3.5	<2	0.9	4.0

HBV & HCV in female sex workers

Discussion

2<

- Hepatitis B : limited number of studies (n=4) ; in 3/4 studies prevalence higher (RR > 4) than in general population
- Hepatitis C : studies difficult to interpret ; not a large problem

Prevalence of HPV in female sex workers compared with general population(GP)

Location	HPV prevalence (%)	GP
Amsterdam	54.6	19
Sofia	43.4	23
Antwerpen	41.7	19.8
Alicante	30.8	10.1

HPV in female sex workers

Discussion

- HPV : prevalence 2 – 4 times higher than in the general population

Prevalence of Trichomoniasis (TV) in female sex workers compared with general population(GP)

Location	TV prevalence (%)	GP
Baltimore	48.5	
England	0.9	0.8
Moscow	12.0	0.8-1.7
Switzerland	10.4	0.0
Meta-analysis	22	5
WHO estimate		2.3

Trichomoniasis in female sex workers

Discussion

- Trichomoniasis : large meta-analysis showed clearly higher prevalence in FSWs than in general population (RR > 4)

Prevalence of HIV and syphilis in male sex workers (MSW) compared with the GP

Place	HIV (%)		Syphilis (%)	
	MSW	GP	MSW	GP
Melbourne	1.7	0.1	6.1	NA
Tel Aviv	5.7	4.7	1.9	3.4
South Limburg	7.6	0.2		
31 European countries			16.5	1.0
31 European countries			9.9	4.5
31 European countries			6.3	2.3
WHO estimate				0.1

Prevalence of gonorrhoea & chlamydia in male sex workers (MSW) compared with the GP

Place	<i>N.gonorrhoeae</i> (%)		<i>C.trachomatis</i> (%)	
	MSW	GP	MSW	GP
Melbourne	10.8	NA	9.6	NA
Tel Aviv	5.7	4.7	3.8	1.7
South Limburg	7.6	0.2	18.4	8.0
WHO estimate		0.3		2.0

Prevalence of HBV & herpes simplex in male sex workers (MSW) compared with GP

Place	Hepatitis B virus (%)		Herpes simplex (%)	
	MSW	GP	MSW	GP
Tel Aviv	1.9	0.4	11.3	5.1
South Limburg	5.2	0.0		

Sexually transmitted infections in sex workers

Discussion : Male sex workers

- Few studies but nearly all show consistently elevated risk compared with the general population
- Risks are smaller than in FSWs but prevalence in comparison groups (MSM) higher

Transgender sex workers

- Studies for HIV (n=3), *N.gonorrhoeae* (n=2), *C.trachomatis* (n=2), *T.pallidum* (n=1), *Trichomonas vaginalis* (n=1)

	Sex workers (%)	General TG population (%)
• HIV :	14.6 – 40.3	13.4.
• <i>N.gonorrhoeae</i>	5.1 – 9.7	7.6
• <i>C.trachomatis</i>	8.0 – 17.7	10.1
• <i>T.pallidum</i>	0.7	2.6
• <i>T.vaginalis</i>	14.5	

Transgender sex workers

Discussion

- Data are sparse and limited to trans women
- Few studies ; showing consistently high prevalence of STIs (HIV, chlamydia, gonorrhoea, infectious syphilis), comparable in SWs and NSWs
- Prevalence of STIs clearly higher than in WHO data in both men and women

Sexually transmitted infections in sex workers

General discussion

Limitations : heterogeneity with regard to definition of sex work, sampling strategy and geographical diversity, precluding statistical meta-analysis

Most studies are on FSWs and limited number of studies on MSWs and TG SWs

Almost no studies /data on *Mycoplasma genitalium*, genital herpes and *H.ducreyi*

Sexually transmitted infections in sex workers

Conclusions

- SW (FSWs, MSWs, TG SWs) have a higher prevalence of a number of STIs compared to the general population : HIV, gonorrhoea, chlamydia, trichomoniasis, HPV and HBV
- Most studies in FSWs and MSWs show an increased prevalence of syphilis
- In TGSWs the risks for HIV, gonorrhoea, chlamydia and syphilis is comparable with TG NSWs but much higher than in the general male or female population
- Choice of comparison groups important (STI clinics, TG,...)
- KB (AR)

Sexually transmitted infections in sex workers

Prevention (1)

Behavioural and biomedical interventions for prevention are only moderately successful in reducing STIs at population level

Optimal access to health and STI services : available, accessible and acceptable health services

Vaccination

Vaccination against HPV and HBV is clearly an option, but implementation studies are limited
Use of meningococcal serogroup B vaccines against gonorrhoea has been recommended by JCVI

Decriminalization of sex work

Sexually transmitted infections in sex workers

Prevention (2)

- List of priority health and structural interventions targeting HIV and other STIs among sex workers (WHO;2022)
 - Prevention (condom, pre-exposure prophylaxis, etc.)
 - Harm reduction interventions (needle and syringe programmes, opioid substitution therapy, naloxone)
 - Behavioural interventions
 - HIV testing services
 - HIV treatment and care
 - Prevention and management of tuberculosis, hepatitis and mental health
 - Sexual and reproductive health interventions

Sexually transmitted infections in sex workers

Prevention (3)

- List of priority health and structural interventions targetting HIV and other STIs among sex workers (WHO;2022)
- Structural interventions
 -
 - Supportive legislation, policy and funding including decriminalization of behaviours (e.g. drug use and possession, sex work, same-gender sex)
 - Addressing stigma and discrimination
 - Available, accessible and acceptable health services
 - Community empowerment
 - Addressing violence

Thank you for your attention !

Questions ?

Antoon.deschryver@proximus.be