Epidemiologic features of syphilis

Robert S. Remis
Ontario HIV Epidemiologic Monitoring Unit
Public Health Sciences, University of Toronto

3rd Annual Sexuality Conference
STI Clinical Update
Guelph, Ontario, June 13, 2005
Organization of presentation

- Epidemiology of syphilis
- Occurrence of infectious syphilis
- Syphilis outbreaks in industrialized countries
- Prevention and control
- Future perspectives
Epidemiology of syphilis

- Organism: spirochaete *Treponema pallidum*
- Stages of infection
  - Primary
  - Secondary
  - Latent (early and late)
  - Tertiary
  - (Congenital)
Epidemiology of syphilis

- Modes of transmission
  - Transplacental (maternal-infant)
  - Bloodborne
  - Sexual (vaginal, anal and oral contact)
    and, theoretically, other direct contact
Epidemiology of syphilis

- Incubation period: 3 weeks (10 days to 3 months)
- Infectivity: susceptibility universal
- 30% of exposures result in infection
- Infectious when lesions of primary and secondary syphilis present
Occurrence of sexually transmitted syphilis

- Endemic at high levels in developing countries
- Sporadic and epidemic in industrialized countries
- Age corresponds to period of greatest sexual activity and partner change as well as sexual network factors
- Males >> females in WICs
Infectious syphilis rates by age and sex

![Graph showing infectious syphilis rates by age and sex in Ontario, Canada. The graph displays the rate per 100,000 population for different age groups and gender, with notes that the 2000 numbers are preliminary and expected to change.](image-url)
Occurrence of sexually transmitted syphilis

- In WICs, incidence increased in 1960s and 1970s
- Most cases (>90%) in men who have sex with men (MSM)
- Marked decrease in incidence starting in early 1980s related to dramatic reduction in high risk sexual behaviours with recognition HIV epidemic in 1981
Occurrence of sexually transmitted syphilis

- 1985-1999 quiescent period
- Most cases imported from hyperendemic countries
- No endemic reservoir of syphilis in Canada
- Dramatic increases seen starting from 1999-2002
Occurrence of sexually transmitted syphilis, UK

- From 1995 to 1998, syphilis rates relatively low and stable
- Increase began in 1998 with sharp rises in 2001 and 2002
- 1997 to 2002 syphilis increased 716%
- 2002: 1,232 cases, males 4.0 and females 0.5 per 100,000
Occurrence of sexually transmitted syphilis, UK

- Outbreaks of syphilis experienced in major urban centres including London, Manchester and Brighton (also in Dublin, Ireland)
- Factors identified in Manchester outbreak:
  - HIV-positivity
  - Large number of anonymous sex partners
  - Oral sex
  - Internet contact

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Occurrence of sexually transmitted syphilis, United States

- From 1990 to 1999 national incidence of decreased from 20.3 in 1990 to 2.1 in 2000
- In 2003 compared to 2000, rate in men increased 62% in men and decreased 53% in women
- Outbreaks among MSM in most major cities, including New York, Chicago, Los Angeles and San Francisco
- Increased rates in non-white MSM

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
P & S syphilis, United States, 1988-2003
P & S syphilis by race/ethnicity, United States, 1988-2003


* Per 100,000 population.
Occurrence of sexually transmitted syphilis, Canada

- National rate attained low plateau of 0.4 per 100,000 in 1996-97
- Increased since 1997 to 0.9 in 2001, 2.7 in 2003 and 3.8 per 100,000 in 2004
- Highest rates in Yukon (12.9), BC (9.6), Ontario (3.8) and Quebec (3.7)
Reported infectious syphilis in Canada, 1994-2001, rate / 100,000

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Occurrence of sexually transmitted syphilis, BC

- BC experienced over six-fold increase in syphilis
- BC cases increased from 7% of Canadian cases to 68% in 1998
- Outbreak concentrated in downtown eastside, Vancouver among sex trade workers and other “street-involved” people and their partners
- Contact tracing ineffective since index cases unwilling or unable to identify contacts

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Occurrence of sexually transmitted syphilis, Calgary

- No locally acquired syphilis in Calgary 1990-1999
- Outbreak began September 2002
- Cases first in MSM and then in heterosexual persons
- MSM outbreaks contacts in bars and by internet and contact in bathhouses
Occurrence of sexually transmitted syphilis, Montreal

- 35 cases, all male & all but one MSM
- Mean age, 38.6 years
- ~50% HIV-positive
- 2/3 cases linked to contact in bathhouses and 1/3 had contact outside Quebec

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Epidemiologic characteristics of syphilis outbreaks in WICs 1999+

- Most outbreaks concentrated in males and, in particular, MSM
- Mostly in major and secondary urban centres
- Oral sex common mode of transmission
- Substantial proportion (25-70%) HIV+

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Epidemiologic characteristics of syphilis outbreaks in WICs 1999+

- High rate of partner change
- Casual, often anonymous, partners met through internet or in bathhouses and other public places
- Heavy use of recreational drugs
Underlying factors in syphilis outbreaks in WICs 1999+

- Increases in risky sexual behaviour related to treatment optimism and safer sex fatigue
- Serosorting (HIV+ concordant) to protect against HIV infection
- Lessened awareness and knowledge of other sexually transmitted infections (STIs)
Underlying factors in syphilis outbreaks in WICs 1999+

- Syphilis is a serious STI transmitted readily by oral sex
- Minority of MSM practicing risky sexual behaviours resistant to change
- Contact tracing not effective in identifying and locating multiple anonymous partners

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Intervention - Primary prevention

- Define population at risk, beyond demographic characteristics
- Target promotion of safer sexual message
  - Change social norms
  - Education about continued risk of STIs
- Referral of persons at high risk for individual interventions
Intervention - Screening

- Educate health care providers about guidelines for syphilis screening
- Increase accessibility of syphilis screening to non-traditional sites
- Sensitize at-risk population about need to seek regular screening
Intervention - Case-finding and contact tracing

- Sensitize health care providers to suspect clinical diagnosis of syphilis
- Sensitize at-risk population to seek care when indicated
- Ensure easy access to care of marginalized populations
- Contact tracing around confirmed cases
Intervention - Surveillance, research and evaluation

- Ensure completeness of case reporting and availability of supplementary data
- Enhanced surveillance
- Analytic studies, if indicated and feasible
- Comprehensive, systematic ongoing evaluation of interventions

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Case-control study - Toronto

- Cases of primary and secondary syphilis
- MSM from Ontario who are sexually active
- Recruitment at six Toronto clinics with highest caseload
- Four controls per case from same clinics
- Detailed questionnaire of sexual history and psychosocial factors administered through internet

Dr. Robert S. Remis
Public Health Sciences, University of Toronto
Case-control study - Toronto

- Detailed questionnaire of sexual history and psychosocial factors administered through internet
- Cases to be recruited from July 2005 to January 2006
Control of syphilis: Future perspectives

- Control of syphilis in MSM major challenge
- Successful control will require considerable political will and substantial allocation of resources
- Evaluation critical to determine program effectiveness
- Informs withdrawal, continuation and redeployment of available resources
Control of syphilis: Future perspectives

- Some indications of partial success
- However, some believe incidence of syphilis may never return to baseline
Acknowledgements

- Frank McGee, AIDS Bureau, Ontario Ministry of Health and Long-Term Care
- Brent Moloughney, consultant, Toronto Public Health
- Nicole Greenspan, MHSc candidate, Department of Public Health Sciences, University of Toronto