P1-S1.33 TIMING OF PROGRESSION OF *CHLAMYDIA TRACHOMATIS* INFECTION TO PELVIC INFLAMMATORY DISEASE - A MATHEMATICAL MODELLING STUDY

doi:10.1136/sextrans-2011-050108.33

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Background Screening programmes aim to detect and treat asymptomatic *Chlamydia trachomatis* (chlamydia) infections to prevent ongoing transmission and reduce the incidence of pelvic inflammatory disease (PID). The timing of development of PID after chlamydia infection might affect the potential impact of screening to interrupt ascending infection. We used mathematical models to study three hypothetical processes for the timing of progression from chlamydia infection to PID and determine which was most consistent with empirical data.

Methods We used data from the Prevention of Pelvic Infection (POPI) randomised controlled trial (RCT) that was designed to examine the effect of chlamydia screening on PID incidence over a follow-up period of 1 year. We developed a compartmental model that simulates the RCT results in a Susceptible-Infected-Susceptible framework and tracks the number of PID episodes in the screened and control groups. The model is fitted to the incidence of 1.9% in the absence of screening (POPI control group) and predicts PID rates when screening is implemented. The hypothesised processes were—PID develops at the beginning of an infection with chlamydia; PID can develop throughout the course of a chlamydia infection at a constant rate; and PID happens at the end of chlamydia infection before spontaneous clearance. We predicted the incidence of PID with each process and compared these with the observed cumulative incidence of 1.3% (95% CI 0.7 to 2.1%) in the POPI screened group. We took into account baseline chlamydia prevalence, screening uptake during the RCT, duration of infection and treatment failure.

Results The mathematical models suggested that the process by which PID develops during the course of a chlamydia infection was closest to the observed cumulative incidence in the screened group, but the process with PID at the end of chlamydia infection was also compatible with the empirical data. The process where PID develops at the very beginning of a chlamydia infection predicted a higher incidence of PID in the screened than the control group. Our model also allowed us to estimate the proportion of chlamydia infections that develops PID and the reduction in PID incidence due to long-term screening.

Conclusion This study suggests that the development of PID can happen during or, possibly, at the end of a chlamydia infection. This implies that screening for chlamydia might have a direct effect on PID prevention by interrupting ascending infection.

P1-S1.34 FIRST REPORT OF THE SWEDISH NEW VARIANT OF *CHLAMYDIA TRACHOMATIS* (nvCT) IN RUSSIA

doi:10.1136/sextrans-2011-050108.34

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Background The new variant of *Chlamydia trachomatis* (nvCT), first reported in Sweden in late 2006, has so far rarely been reported outside the Nordic countries. However, knowledge of the presence of nvCT beyond these countries is limited due to the few recent studies, many laboratories still cannot detect nvCT, and the ones that can detect nvCT do mainly not distinguish it from wild type CT. The aims were to i) investigate the presence of nvCT in St. Petersburg, the largest city of the Northwest of Russia and in close proximity to Sweden, and ii) assess nucleic acid amplification tests (NAATs) used in Russia to diagnose *C trachomatis* infections for their ability to identify nvCT.

Methods June—December 2010, consecutive samples (cervical swabs from females and urethral swabs from males) found positive for *C trachomatis* during routine testing with commercial PCR assays able to detect nvCT were collected. For nvCT detection, DNA was isolated using NucliSens easyMAG (bioMérieux) or QIAamp DNA mini kit (Qiagen), and analysed with an international real-time nvCT-specific PCR. *C trachomatis* NAATs currently used in Russia was also examined regarding their ability to detect nvCT DNA.

Results During the study period, 9517 samples were submitted from patients of gynaecological, urological and STI clinics for *C trachomatis* testing. Of these samples, 275 (2.9%) from 198 females and 75 males were positive for *C trachomatis*. The mean age of the patients was 26.4 years (range 19—51 years). nvCT was detected in one sample (0.4%), which was obtained from a 23-year-old Russian woman. Genotyping using variable number of tandem repeats (VNTR) typing showed that the nvCT was indistinguishable to the previously typed nvCT samples from the Nordic countries (type 8.7.1). Six NAATs, which are used in the majority of laboratories in Russia performing *C trachomatis* diagnostics, were assessed for the ability to detect nvCT (Abstract P1-S1.34 table 1). All evaluated assays, with exception of the Lytech PCR, tested positive with nvCT DNA. Conclusions This study is the first report of an nvCT case in Russia, and in general in Eastern Europe, and that evaluates most *C trachomatis* NAATs currently used in Russia for the ability to detect nvCT. Although the prevalence of nvCT is still considered low outside Northern Europe, wider geographic spread of nvCT cannot be excluded, and therefore regular monitoring and participation in external quality assessments of diagnostic methods in use are necessary.

Abstract P1-S1.34 Table 1 Nucleic acid amplification tests (NAATs) developed and used in Russia for the detection of *Chlamydia trachomatis* and their ability to detect nvCT

NAAT (Manufacturer, City)	Gene target(s)	Able to detect nvCT?
Conventional PCR (DNA-Technology, Moscow)	Cryptic plasmid	Yes
Real-time PCR (DNA-Technology, Moscow)	16S rRNA gene	Yes
Conventional PCR (Central Research Institute of Epidemiology, Moscow)	Cryptic plasmid	Yes
Real-time PCR (Central Research Institute of Epidemiology, Moscow)	Cryptic plasmid	Yes
Conventional PCR (Lytech, Moscow)	Cryptic plasmid	No
Real-time PCR (Vector-Best, Novosibirsk)	Cryptic plasmid and *gyrA* gene	Yes

P1-S1.35 DECLINING POSITIVITY AMONG 15—24-YEAR-OLDS SCREENED FOR CHLAMYDIA IN ENGLAND - A SIGN OF FALLING PREVALENCE OR A SYMPTOM OF CHANGING UPTAKE?

doi:10.1136/sextrans-2011-050108.35

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Background The number of tests performed as part of the National Chlamydia Screening Programme (NCSP) has increased since the start of the programme in 2003 and the positivity has declined. We explored the extent to which available data can be used to adjust for changes in who is being screened in order to estimate any changes in the population prevalence up to 2010.

Methods Analyses of positivity trends were conducted using available data for opportunistic asymptomatic tests (screens) from the NCSP national dataset for 2005 to 2010 from areas that implemented screening throughout this time period. Age, sex, ethnicity, sexual behaviour, regional and venue of screen weights for the English population of 15–24-year-olds were derived (from national sources where available) and applied to the dataset.
Results From 2005 to 2010 there was an increase in screens among men. There were no major changes in characteristics known to be associated with infection (year of age, sexual behavioural variables). Available data on sexual behavioural variables and ethnicity decreased over time. There were some changes in venue use over time. Weighting for 5-year age group, sex, <2 sexual partners in past 12 months, ethnicity and region lowered positivity in each year but slightly increased the decline in positivity from an average decline of 13% per year (from 11% in 2005 to 6% in 2010) to an average of 14% per year (from 10% to 4%). Additional standardisation by screening venue did not reduce the overall observed decline in positivity during this period. Differences in positivity between venues remained, but were slightly reduced, after weighting for differences in known characteristics of screened clients.
Conclusions The observed decline in positivity over time among screens was not accounted for by weighting for known characteristics of those screened or changes in testing venues. Together with the consistency of declining positivity in all sub-categories this suggests that a true decline in population prevalence may have occurred. Further analyses of the potential effects of data limitations and using regression techniques with additional variables (eg, deprivation) are in progress to better understand the relationship between screen positivity and population prevalence at different levels of screening uptake in England.

Epidemiology poster session 1: STI trends: *Neisseria gonorrhoeae*

P1-S1.36 PREVALENCE OF *NEISSERIA GONORRHOEAE* INFECTIONS AMONG MEN AND WOMEN ENTERING THE NATIONAL JOB TRAINING PROGRAM-USA, 2004–2009

doi:10.1136/sextrans-2011-050108.36

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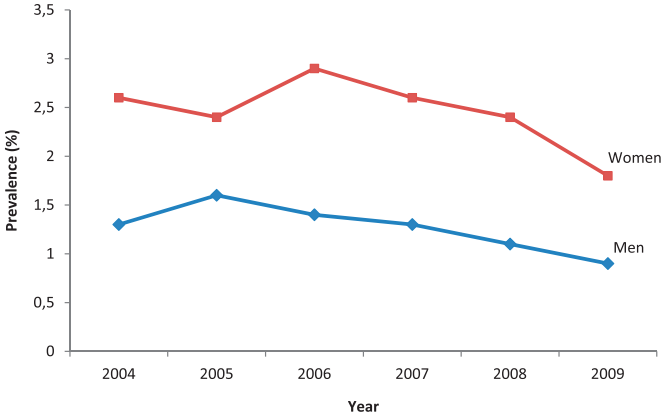
Background National notifiable disease data indicate that 99 of every 100 000 persons in the USA were infected with gonorrhoea in 2009, the lowest recorded gonorrhoea rate in US history. However, the extent to which declining case reports signify a reduction in prevalence is unknown. In order to better understand national gonorrhoea trends, we examined prevalence over time among men and women entering the National Job Training Program (NJTP).
Methods Gonorrhoea prevalence was estimated among 16–24-year-old men and women entering the NJTP in 48 states and the District of Columbia from 2004–2009. To approximate gonorrhoea screening, only data from the 105 (85% of all 123) centers that performed gonorrhoea testing on at least 50% of the population were included. Conditional logistic regression was used to assess the probability of testing positive for gonorrhoea over time, adjusted for variables associated with gonorrhoea risk.
Results 95 184 men and 91 697 women were screened for gonorrhoea upon entry to the NJTP from 2004 to 2009. For women, gonorrhoea prevalence increased from 2004 (2.6%) to 2006 (2.9%), then decreased steadily through 2009 (1.8%). For men, prevalence increased from 2004 (1.3%) to 2005 (1.6%), then decreased through 2009 (0.9%). Gonorrhoea prevalence among black women decreased from 3.6% in 2004 to 2.5% in 2009 and was 2–4 times higher than prevalence among white women during the study period. Likewise, prevalence among black men decreased from 2.0% to 1.5% and was 8–22 times higher than prevalence among white men. After adjusting for age, race, region, and test technology, the odds of a woman testing positive for gonorrhoea decreased by 50% from 2004 to 2009. Similarly, the odds of a man testing positive for gonorrhoea decreased by 40% during the study period see Abstract P1-S1.36 Figure 1.
Conclusions Declining trends in gonorrhoea infection among NJTP entrants are similar to those observed in gonorrhoea case report data, suggesting that the decrease in case reports is due to a decrease in prevalence. Both data sources also demonstrate continuing racial disparities in gonorrhoea infection between blacks and whites. Interventions to reduce gonorrhoea infections should be developed to reach populations with a disproportionate risk.



Abstract P1-S1.36 Figure 1 Gonorrhoea prevalence among men and women screened for gonorrhoea at entry to the National Job Training Program—USA, 2004–2009.

P1-S1.37 PREVALENCE OF AND RISK BEHAVIOURS FOR *NEISSERIA GONORRHOEAE* IN PARTURIENT WOMEN AGED 15–24 IN BRAZIL

doi:10.1136/sextrans-2011-050108.37

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Background *Neisseria gonorrhoeae* (NG) is a sexually transmitted infection having repercussions on reproductive health and impact on the fetus. Our goal was to estimate the prevalence of and risk factors for NG in young parturient women in Brazil.
Methods A national cross-sectional study among parturient women, aged 15–24, attending Brazilian public hospitals was performed in 2009. Participants answered a questionnaire including demographic, behavioural and clinical data. A sample of urine was collected and screened for NG and *Chlamydia trachomatis* (CT), using PCR.
Results A total of 2400 women were selected and 2071 (86.3%) participated in the study. Mean age was 20.2 years (SD 2.7). A total of 59.1% had up to 8 years of schooling and 93.3% reported an income under US$ 500. Ninety-five per cent attended antenatal care. Prevalence of NG was 1.0% (95% CI 0.6% to 1.4%) and 4% of women infected with NG also had CT infection. First sexual intercourse was reported under 15-years old by 32.8%; 5% reported previous STI; 0.8% were commercial sex workers and 6.0% used illicit drugs. NG associated factors in the final logistic model were—being single [OR=3.2 (95% CI 1.27 to 8.01)]; having more than one sexual partner in lifetime [OR=1.6(95% CI 1.13 to 2.26)]; and CT infection [OR=7.7(95% CI 2.99 to 19.91)].