

and methicillin susceptible *Staphylococcus aureus* (MSSA) colonisation and infection among MSM in Amsterdam, the Netherlands. **Methods** MSM attending the sexually transmitted infections outpatient clinic in Amsterdam were invited to participate in this study and divided in two groups: (1) MSM with clinical signs of a skin/soft tissue infection (symptomatic group) and (2) MSM without clinical signs of such infections (asymptomatic group). Demographic characteristics, medical history, sexual behaviour, history of sexual contacts and known risk factors for colonisation with *S aureus* were collected through a self-completed questionnaire. Swabs were collected from the anterior nasal cavity, throat, perineum, penile glans and, if present, from infected skin lesions. Culture for *S aureus* was done on blood agar plates and for MRSA broth on selective chromagar plates after enrichment in broth. If MRSA was found, the sex partners of the index patient were invited for screening for MRSA.

Results Between October 2008 and April 2010 a total of 214 MSM were included in the study: 76 into the symptomatic group and 138 MSM into the asymptomatic group. The prevalence of MSSA in the nose was 36% (78/214) and in skin lesions 36% (27/76). The prevalence of MRSA was 0.9% (2/214). Both MRSA cases, one asymptomatic and one symptomatic, were HIV positive. The asymptomatic MRSA carrier had been hospitalised the previous year. None of the four sexual contacts that could be traced were colonised by MRSA. The symptomatic MRSA case had a soft tissue infection in the genital area; in this case also the nasal cavity, perineum and glans penis were positive for MRSA. No sexual contacts could be traced. There were no significant differences in age, sexual risk behaviour, drug use, history or diagnoses of sexual transmitted diseases, circumcision status or hygiene behaviour between those with and without a genital *S aureus* infection, but those infected with *S aureus* were significantly more often HIV infected (55% vs 34%; $p<0.01$).

Conclusion CA-MRSA among MSM STI outpatient clinic visitors in Amsterdam is rare. There were no indications for sexual transmission of MRSA or MSSA in this population.

01-S03.06 EVIDENCE OF CIRCULATING MACROLIDE RESISTANCE IN MYCOPLASMA GENITALIUM INFECTIONS AND DEVELOPMENT OF A RAPID ASSAY TO DETECT RESISTANCE

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Background *Mycoplasma genitalium* (Mg) is a sexually transmitted bacterium causing urethritis, cervicitis and longer term sequelae such as pelvic inflammatory disease. At Melbourne Sexual Health Centre (MSHC), Australia, from December 2007 to December 2009, 111 *M genitalium* infected patients (86 males/25 females) were treated with 1 g azithromycin with a cure rate of 69% (95% CI 60% to 77%). Resistance to macrolide antibiotics such as azithromycin occurs via mutations of the Mg 23S rRNA gene in response to exposure of sub-therapeutic doses of the drug. It is our hypothesis that the unacceptably high rate of treatment failures seen at this clinic is due to macrolide resistant Mg strains circulating in the community. To test this theory, we determined whether resistance was present in initial consult samples collected at MSHC, and we developed a rapid assay able to detect resistance during routine diagnostics.

Methods A subset of 83 Mg positive samples from patients taken prior to azithromycin was analysed in this study (62 males/20 females); 56 of these patients were subsequently cured by azithro-

mycin and 27 cases failed azithromycin. DNA sequencing was then carried out to determine each respective 23S rRNA sequence type. A real-time PCR assay coupled with high resolution melt analysis was developed to detect the mutational changes in the Mg 23S rRNA gene, dubbed MARS (Macrolide Antibiotic Resistance Screen), and was tested against a panel of known macrolide resistant Mg isolates and the subset of samples from MSHC.

Results In total, 16/83 (19%) of the pre-treatment samples tested possessed 23S rRNA mutations conveying macrolide resistance; significantly more patients who failed 1 g azithromycin had pre-existing macrolide mutations (12/27; 44%) compared to those who were cured by 1 g azithromycin (4/56; 7%); $p<0.0001$ (Abstract O1-S03.06 table 1). The MARS assay that was developed was able to identify when a 23S rRNA mutation was present in 100% of these samples.

Conclusions This data shows compelling evidence that macrolide resistance is circulating in certain populations and is attributing to a significant level of treatment failures seen in an Australian sexual health clinic. The development of a rapid molecular assay to detect resistance provides the means for clinicians to choose a more appropriate second line treatment option such as moxifloxacin, and thereby reduce transmission of resistant strains and avoiding sequelae associated with persistent infection.

Abstract O1-S03.06 Table 1 23S rRNA gene mutations present in a subset of 2007–2009 Mg positive samples from initial consult from MSHC

Sequence type	Patients failing azithromycin, n = 26 (%)	Patients cured by azithromycin, n = 56 (%)	p Value	Detection with MARS
Detection of any 23S rRNA gene mutation	12 (44)	4 (7)	<0.0001	100%
A2059G	7	3	0.01	
A2058G	4	1	0.04	
A2059C	1	—	—	
Wild type	14	52	<0.0001	100%

Epidemiology oral session 4: STI and HIV among youth

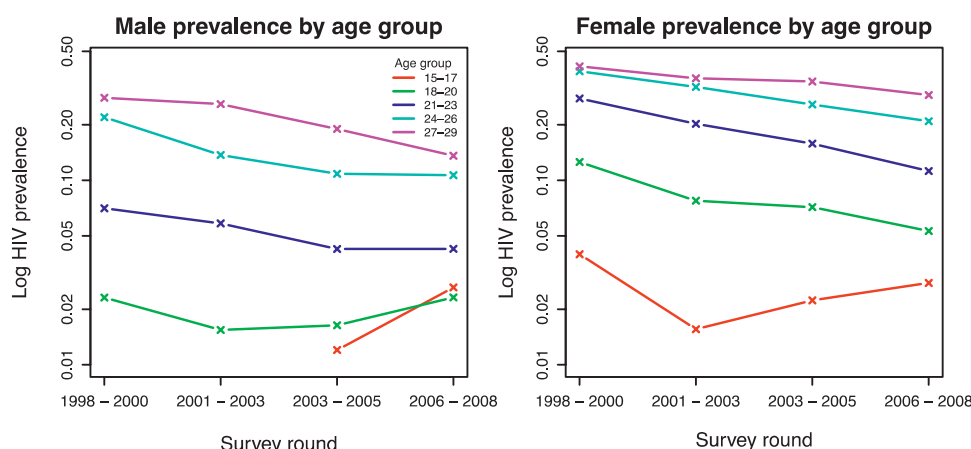
01-S04.01 INCREASING ADOLESCENT HIV PREVALENCE IN NORTHEASTERN ZIMBABWE: EVIDENCE OF LONG-TERM SURVIVORS OF MOTHER TO CHILD TRANSMISSION

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Background Longitudinal data from eastern Zimbabwe suggested an increase in HIV prevalence among 15 to 17 year olds between 2005 and 2008. Prevalence increased from 1.2% to 2.6% among adolescent males and from 2.2% to 2.8% in females (see Abstract O1-S04.01 figure 1). This is surprising given a general trend of decreasing HIV prevalence in the past decade associated with a reduction in sexual risk behaviour. It is unknown whether the increase is the result of resurgence in risky sexual behaviour, or long-term survival of infants infected perinatally during the early 1990s when prevalence was increasing exponentially among pregnant women in Zimbabwe

Methods We use data from the Manicaland HIV/STD Prevention Project collected between 2006 and 2008 to test hypotheses indicating whether adolescent HIV infections are likely sexually acquired or perinatally acquired. We use Fisher's exact test and relative risk regression to examine the association between



Abstract 01-S04.01 Figure 1

adolescent HIV infection and (i) maternal mortality, (ii) adolescent sexual behaviour, and (iii) chronic illness.

Results There were 990 males and 972 females aged 15 to 17 years included in the cohort. Mothers of HIV positive adolescent males were more likely to be deceased than those of HIV negative males (RR 2.72, $p < 0.001$). Mothers of HIV positive females were not more likely to be deceased, but were more likely to be HIV positive if still alive (RR 3.68, $p < 0.001$). Among males there was no association between having had sex and HIV status. Sexually active females were more likely to be HIV positive (RR 2.44, $p = 0.042$). During the period that adolescent prevalence increased, the proportion of adolescent males who reported having had sex reduced from 14% to 8% ($p < 0.001$), and did not change in females. HIV positive adolescents were more likely to report recurring sickness or chronic illness, indicative of late-stage HIV infection.

Conclusions Increasing HIV prevalence in adolescent males cannot be explained by a rebound in sexual risk behaviour and is likely attributable to long-term survivors of perinatal HIV transmission. Among females, both perinatal and sexual transmission account for adolescent HIV infections. These findings question the interpretation of HIV prevalence in young people as an indicator of recent trends in HIV incidence. They suggest an urgent need to prevent onward HIV transmissions by perinatally infected adolescents and the expansion of HIV testing and treatment to include young people.

01-S04.02 REGIONAL HIV SURVEILLANCE OF YOUTH MSM THROUGH MULTILEVEL ANALYSIS OF RDS STUDIES IN LATIN AMERICA

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Background Men who have sex with men (MSM) are the population most affected by HIV in Latin America (LA). Youth MSM (YMSM) are of particular interest given potentially greater levels of risk behaviour and as a barometer of recent epidemic dynamics. Yet single MSM studies lack sufficient sample size to characterise YMSM so that HIV prevalence and variation among YMSM within LA is unknown.

Methods We developed a multilevel statistical framework to borrow strength across recent (2006–2009) respondent-driven sampling

(RDS) studies with similar survey methodologies to permit characterisation of HIV prevalence and risk factors among YMSM in LA and comparisons across cities. Data from participants aged 18–24 years tested for HIV in MSM studies in nine high-population cities in Argentina, Bolivia, Costa Rica, El Salvador and Honduras (N=1410) were pooled. Weights incorporating personal network and population sizes adjusted for selection probability. Logistic, multi-level models identified correlates of HIV infection, including city-level fixed effects and accounted for intraclass correlation within recruitment chains.

Results HIV prevalence was 4.6% (95% CI: 3.2% to 6.5%) in the pooled sample and varied significantly across cities from 2.7% in Buenos Aires, Argentina to 9.3% in San Pedro Sula, Honduras. Samples varied ($p < 0.05$) in terms of completion of secondary education (69.6%–100.0%), gay (range 2.5%–77.5%) and bisexual self-identity (18.8%–97.6%), past-year drug use (5.9%–64.8%), condom use at last anal sex (26.6%–72.7%) and other risk behaviours, knowledge of HIV prevention and transmission (26.4%–71.9%) and lifetime HIV testing (28.7%–59.2%). In multivariate analysis, syphilis infection (adjusted OR [AOR]=2.5), aged 23–24 years (vs 18–22) (AOR=2.2), past-year crack/cocaine use (AOR=2.2) and bisexual self-identity (AOR=0.5) were associated with HIV infection. Significant city effects for Salvador, El Salvador and Santa Cruz, Bolivia persisted net of individual-level differences.

Conclusions Formal comparisons of HIV burden and risk differences among cities can be achieved through multilevel analysis. HIV prevalence, drug and sexual risk behaviours, and low HIV testing among YMSM in LA are considerable and vary substantially within the region. The need for prevention among YMSM in LA is urgent and must address substance abuse, STI and be tailored to local context. Prevention should target younger YMSM as probability of infection rises rapidly with age.

01-S04.03 CO-INFECTION WITH SEXUALLY TRANSMITTED INFECTIONS AMONG CANADIAN STREET-INVOLVED YOUTH 2001–2006

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Background Canadian street-involved youth are at greater risk for sexually transmitted infections (STIs), due to their increased