Methods In a prospective study among 2269 HIV-1 infected ART-naïve women from 7 countries in East and southern Africa, we examined the effect of pregnancy on HIV-1 disease progression. We used random effects models to compare CD4 and plasma viral load changes between pregnant, postpartum and non-pregnant periods (prenatal periods from women who became pregnant and all periods from women who did not become pregnant). Among women who became pregnant, we compared CD4 counts during prenatal, pregnant, and postpartum periods.

Results Women contributed 3471 person-years and 475 women became pregnant (7.2% of time was pregnant and 6.8% was postpartum). After accounting for baseline levels, CD4 counts were 67.7 cells/mm^3 lower (95% CI 55.5–79.9) during pregnant compared to non-pregnant periods and 81.2 cells/mm^3 lower (95% CI 65.3–97.2) during pregnant compared to postpartum periods. After adjustment for baseline viral load, there were small increases in plasma viral load: a 0.05 $\log_{10}$ increase in pregnant vs. non-pregnant periods (95% CI 0.01–0.10) and a 0.08 $\log_{10}$ increase in pregnant vs. postpartum periods (95% CI 0.01–0.14). Postpartum CD4 and plasma viral loads were not different from non-pregnant periods (p = 0.1 and p = 0.5). Among women who experienced pregnancy, CD4 counts were 59.6 cells/mm^3 lower (95% CI 35.2–84.0) during pregnant versus prenatal periods and 71.6 cells/mm^3 lower (95% CI 48.0–95.1) during pregnant versus postpartum periods. Prenatal and postpartum CD4 counts were similar (p = 0.4).

Conclusion CD4 count and plasma viral load changes among HIV-1 infected women during pregnancy are not permanent and are likely to return to prenatal levels. Pregnancy was not associated with subsequent disease progression.

P3.201 **RECENT SYPHILIS PREDICTS HEPATITIS C VIRUS (HCV) SEROCONVERSION AMONG HIV-POSITIVE MEN WHO HAVE SEX WITH MEN (MSM)**

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[1,2]**A N Burchell**, [1]M Manno, [1,2]S Gardner, [3]T Mazzulli, [2]R S Remis, [4,2]A Bayoumi, [5]F McGee, [2]P Millson, [6,2]J Raboud, [1,2]S B Rourke. [1]Ontario HIV Treatment Network, Toronto, ON, Canada; [2]University of Toronto, Toronto, ON, Canada; [3]Public Health Ontario, Toronto, ON, Canada; [4]St. Michael's Hospital, Toronto, ON, Canada; [5]Ontario Ministry of Health and Long Term Care, Toronto, ON, Canada; [6]University Health Network, Toronto, ON, Canada

Background There is evidence of sexual HCV transmission among HIV-positive MSM from the UK and Europe. We estimated HCV seroincidence and its risk factors in a North American population of HIV-positive MSM with no known history of injection drug use.

Methods We analysed data from the OHTN Cohort Study, an ongoing cohort of persons in HIV care in Ontario, Canada. Data were obtained from medical charts, interviews, and record linkage with the provincial public health laboratories. We restricted the analysis to 1,534 MSM who: (1) did not report injection drug use; (2) were under follow-up in 2000–2010; and (3) had 2+ HCV antibody tests, of which the first was negative. Person-time commenced at the later of the HCV-negative result or HIV diagnosis and ended at the first HCV+ or last date of follow-up (median 6.1 person-years (PY) of follow-up; sum 9,987PY).

Results We observed 51 HCV seroconversions, for an overall incidence of 0.51 per 100PY (CI: 0.39–0.67). Annual incidence varied from 0.16 to 0.89 per 100 PY, with no statistical evidence of a temporal trend. Seroconversion was statistically-significantly associated with acute syphilis infection in the previous 6 months (adjusted hazard ratio = 4.9, CI 1.2–21) and there was a marginally statistically-significant association for men who had not yet initiated antiretroviral treatment (adjusted hazard ratio = 1.9, CI 0.91–4.0). There were no statistically significant effects of age, ethnicity, region, CD4+ cell count or viral load.

Conclusion Sexual behaviour was unmeasured and we cannot exclude the possibility of HCV acquisition via unreported injection drug use. Nevertheless, the strong association with recent syphilis suggests that at least some cases were due to sexual transmission. Future research is needed to establish whether syphilis is a marker for high-risk behaviour or may potentiate sexual HCV transmission among persons with HIV.

P3.202 **ESTIMATION OF HIV INCIDENCE IN BRAZIL, 2004–2011**

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C L Szwarcwald, P R B Souza-Jr. Fiocruz, Rio de Janeiro, Brazil

Background The HIV incidence is the most valuable indicator of epidemiological surveillance as it establishes the degree to which HIV transmission is occurring and which groups are most at risk for HIV infection. However, the HIV incidence is a difficult indicator to estimate. This paper addresses a method to estimate the HIV incidence in Brazil in recent years.

Methods The information source is SISCEL, which is the national laboratory-based surveillance system created to monitor CD4+/CD8+ T lymphocytes and HIV viral load. The proposed method is based on the first CD4 count after HIV diagnosis among all treatment-naïve cases registered in SISCEL in the time period 2004–2011. A regression model that relates progress of CD4 to time of seroconversion was used to estimate time of HIV infection at the date of first CD4 count. The analysis was performed by sex and age group.

Results For all years, the proportion of HIV cases registered in SISCEL in the same year of infection was 31%, and approximately 6% for each year of the 5 subsequent years after infection, so that almost 40% cases are registered in SISCEL only 7 years or more after infection. The HIV incidence was stable in the period 2005–2011. After adjusting for HIV cases tested in private laboratory and undiagnosed cases not registered in SISCEL, the mean estimate was 41600 cases, corresponding to an HIV incidence rate of 0.27 per 1000 population. Analysis by sex and age showed a rising trend among males, particularly for young men, and a decreasing trend among females.

Conclusion In terms of late HIV diagnosis, the results indicate that coverage of HIV testing in the general population should be largely expanded. As to most at risk populations, the findings suggest that interventions should be focused on young adult men to reverse the increasing trend.

P3.203 **MORTALITY RATES IN HIV-1/2 DUAL- AND MONO-INFECTED INDIVIDUALS: A SYSTEMATIC REVIEW AND META-ANALYSIS**

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[1]P Prince, [1]A Matser, [2]C van Tienen, [1]**M Schim van der Loeff**. [1]Public Health Service of Amsterdam, Amsterdam, The Netherlands; [2]Medical Microbiology & Infectious Diseases, Erasmus Medical Center, Rotterdam, The Netherlands

Background Although HIV-1 and HIV-2 share the same transmission routes, HIV-2 is less transmissible, it has a longer median time from infection to AIDS, and the associated mortality risk is lower. It has been suggested that HIV-2 infection inhibits HIV-1 disease progression in dually infected (HIV-D) individuals, but whether the mortality rate of HIV-D infected individuals differs from that of HIV-1 mono-infected individuals is still not clear. We conducted a systematic review and meta-analysis on HIV mortality.

Methods Medline and Embase databases were searched. The inclusion criteria for studies were an antiretroviral therapy-naïve population during follow-up, reporting mortality data and

person-years of observation (pyo) for at least two of the three HIV-groups, i.e. a HIV-1 mono and/or a HIV-2 mono and/or a HIV-D infected group. Meta-analyses were performed using random effects models, estimating combined mortality rate ratios (MRRs).

Results Of the 631 identified titles, 7 articles met the inclusion criteria. Of these, 6 articles were included in the meta-analysis of HIV-D versus HIV mono-infected and 7 were included in the analysis of HIV-1 versus HIV-2 mono-infected people. The overall MRR of HIV-D versus HIV-1 was 1.11 (95% CI 0.95–1.30). The overall MRR of HIV-D versus HIV-2 was 1.81 (95% CI 1.43–2.30) and the MRR of HIV-1 versus HIV-2 was 1.86 (95% CI 1.44–2.39)

Conclusion The mortality rate of HIV-D infected individuals did not significantly differ from the mortality rate of HIV-1 mono-infected individuals. The mortality rates of both HIV-1 mono-infected and HIV-D infected individuals were significantly higher than the rate among HIV-2 mono-infected individuals. Therefore, we conclude that HIV-2 mono-infected have a lower mortality rate than HIV-1 infected individuals, but there is no evidence that HIV-D infected individuals survive longer than HIV-1 mono-infected individuals.

P3.204 | **HIV RISK BEHAVIOUR AMONG MEN WHO HAVE SEX WITH MEN IN YANGZHOU AND GUANGZHOU CHINA: A COHORT STUDY**

Q. Wang, Y Yin, X Chen, G Liang, B Wang, R Zhang, N Jiang. *Institute of Dermatology, Chinese Academy of Medical Sciences, Nanjing, China*

Background This study provides the HIV prevalence, HIV incidence, HIV risk-factors, and demographics of Yangzhou MSM and a comparison of HIV risk behaviour among Yangzhou and Guangzhou MSM in China.

Methods A cross-sectional study and a prospective cohort study were conducted among MSM in Yangzhou and Guangzhou from July 2009 to September 2010. A total of 617 MSM (317 Guangzhou, 305 Yangzhou) were screened for eligibility.

Results Compared with Guangzhou sample, Yangzhou sample was significantly older and lower educated and less likely to identify themselves as homosexual (p < 0.001), but more likely to be married (p < 0.001), and more likely to sex intercourse with female (p<0.001). No significant differences were found in receiving more than 5 sexual health services in two samples (p > 0.05) and the proportions never or not always using condoms during sex with female and always use condoms in such a case (p > 0.05). A higher prevalence of HIV and syphilis was found among Yangzhou sample than Guangzhou sample (p < 0.001). Aged (older than 40 years), married, and syphilis-positive were associated with HIV infection in both samples In Multivariate logistic regression analysis.

Conclusions There were significantly differences in demographic characteristics and risk sexual behaviours and the prevalence and incidence of HIV and syphilis between Yangzhou sample and Guangzhou sample. Our results showed that Yangzhou sample was at higher risk of infection of HIV than Guangzhou sample and reinforced the strong need for more and further investigation targeting MSM in economic-medium cities to prevent HIV in China.

P3.205 | **DECLINING HIV PREVALENCE IN ZAMBIA: SENTINEL SURVEILLANCE PROGRAMMATIC INSIGHT AND THE NEED FOR HIV INCIDENCE DATA**

[1]**S Kamocha**, [2]C Mulenga, [2]D Mwakazanga, [3]M Monze, [2]I Nyoni, [1]F Soud, [1]M Shields, [1]M Marx. [1]*Centers for Disease Control and Prevention, Lusaka, Zambia;* [2]*Tropical diseases research centre, Ndola, Zambia;* [3]*University teaching hospital, Lusaka, Zambia*

Background Antenatal clinic (ANC) HIV sentinel surveillance has provided key data to inform health policy, especially between population-based surveys. HIV prevalence among teenage attendees has been used as a proxy for incidence in Zambia, where incidence data are lacking. We present trends in HIV prevalence among ANC attendees in Zambia since 1994.

Methods We assessed HIV prevalence in 15–39 year-old women accessing ANC in convenience sample-based cross-sectional surveys in 21 sites in 1994, 1998, 2002, 2004, 2006, 2008 and 2011. Anonymous blood was tested from consecutively-enrolled women on their first ANC visit; age, residence, parity and gravidity were also noted. We evaluated trends in HIV prevalence.

Results Among 8,222 women surveyed in 2011, HIV prevalence remained essentially unchanged from 2008 (16.2% vs. 16.4%, p = 0.74), but declined from a peak of 19.6% in 1994 (p < 0.001). Similarly, HIV prevalence stagnated among 1,661 15–19 year-olds between 2011 and 2008 (7.9% vs. 8.3% p = 0.66) but declined from its peak of 13.9% in 1994 (p < 0.001). Declines in HIV prevalence among rural residents have been modest (11.8% peak in 2004 vs. 10.4% in 2011 [n = 2904], p = 0.09). HIV prevalence among 5,318 urban women declined from 22.8% in 2008 to 19.6% in 2011 (p < 0.001), the lowest level since a peak of 27.6% in 1994 (p < 0.001). Among 904 15–19 year-old urban women HIV prevalence declined in 2011 (10.1%) from a peak of 16.4% in 2002 (p < 0.001), but was essentially unchanged compared to 2008 (11.1%, p = 0.42).

Conclusions HIV prevalence declined in urban ANC attendees from 2008–2011 and in all surveyed ANC attendees compared to 1994. Results suggest success in prevention activities over the past 17 years, especially among urban women. Declines in prevalence have slowed recently, likely reflecting increased treatment-related survival possibly combined with decreases in incidence. Incidence and survival data are needed to fully understand these data.

P3.206 | **CHARACTERIZING HIV SERO-DISCORDANCY AMONG STABLE COUPLES IN CAMBODIA, THE DOMINICAN REPUBLIC, HAITI, AND INDIA**

[1]**H Chemaitelly**, [1,2,3]L J Abu-Raddad. [1]*Infectious Disease Epidemiology Group, Weill Cornell Medical College-Qatar, Doha, Qatar;* [2]*Department of Public Health, Weill Cornell Medical College, Cornell University, New York, NY, United States;* [3]*Vaccine and Infectious Disease Institute, Fred Hutchinson Cancer Research Center, Seattle, WA, United States*

Background Characterizing the epidemiology of HIV sero-discordancy among stable couples (SCs) is essential to inform HIV policy and programming, especially considering the recent availability of efficacious interventions among stable HIV sero-discordant couples (SDCs). This work complements a quantitative assessment of HIV sero-discordancy among SCs in sub-Saharan Africa (SSA), by analysing sero-discordancy in all countries outside SSA for which HIV biomarker demographic and health surveys (DHS) are available.

Methods We derived measures of HIV sero-discordancy using nationally-representative DHS data for Cambodia, the Dominican Republic (DR) including a sub-population at higher risk of HIV (Bateyes-DR), Haiti, and India. Vietnam was excluded from our analysis because of the low number of couples affected by HIV (3 couples).

Results HIV was more prevalent in Bateyes-DR (3.3%) and Haiti (2.2%) than in other settings (< 1%). About two-third of the population in reproductive age in these countries were engaged in SCs. The proportions of SCs affected by HIV and of SDCs were, respectively, 5.7% and 4.2% (Bateyes-DR), 4.7% and 3.2% (Haiti), 1.2% and 0.9% (DR), 1.0% and 0.5% (Cambodia), and 0.5% and 0.4% (India). Among SCs affected by HIV, 74.3% were sero-discordant in Bateyes-DR compared to 68.3% in Haiti, 70.1% in DR, 51.6% in Cambodia, and 78.5% in India. About a third of HIV sero-positive persons had