

Conclusions Rates of STIs are strongly associated with deprivation. Presentation of STI rates by ethnic categories should be adjusted to take into account the strong interaction between ethnicity and SED. While SED is a key determinant of ill health other cultural influences on sexual behaviour may contribute to STI risk exposure among ethnic groups. The high STI rates seen among black ethnic communities are likely to be the consequence of a complex interplay of cultural, economic and behavioural factors.

Epidemiology poster session 6: Preventive intervention

P1-S6.01 CONTROLLING THE HETEROSEXUAL HIV EPIDEMIC IN LOW-PREVALENCE DOMAINS

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Background HIV/AIDS has a manifest ability to swell to epidemic proportions and debilitate entire societies. Currently, the disease remains below the level of a generalised epidemic¹ in the USA and many other developed nations. Yet the number of reported HIV infections continues to expand steadily.² The same strains of virus affect all humans, but their ecology and epidemiology are markedly different in opposite-sex vs same-sex communities. Variance terms in the transmission equations of opposite-sex communities are reduced in same-sex communities, changing the dynamics of the disease and the interventions that could successfully control it.

Methods and Results We apply mathematical disease models of minimal complexity and higher complexity equation-free network models to show how (1) purely epidemiological forces are sufficient to explain the rapid spread of the virus through male same-sex communities, independent of usual assumptions of more dangerous or careless sexual practices in those communities³, (2) the expansion tendencies of HIV can be counteracted in national testing and treatment programs aimed at breaking the spread of infection, and (3) simple behavioural changes resulting from increased awareness of infection through increased testing⁴ can conceivably bring the infection under control in the heterosexual community, even without universal voluntary testing.⁵

Conclusions Much world effort properly is being focused where the disease is rampant, as in opposite-sex communities in many African nations⁶ as well as male same-sex communities everywhere.⁷ Critical attention must be continued in these sensitive populations, but attention throughout the general population is called for as an additional pre-emptive measure. Our results illustrate how expanded efforts in low-prevalence heterosexual communities throughout the developed world could moderate the expanding infection there, arrest it before it reaches run-away levels, and conceivably cause it to decline and eventually vanish from the general population.

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P1-S6.02 CONTRACEPTIVE DISCONTINUATION BY RURAL KENYAN WOMEN IN HIV DISCORDANT PARTNERSHIPS AFTER EXITING AN HIV PREVENTION TRIAL

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Background Women in biomedical HIV prevention clinical trials are frequently counselled to use effective contraceptive methods in order to avoid pregnancy during the study and consequent withholding of study products. Moreover, research study participants often have access to medical care at research clinics that might not otherwise be as readily available in their communities. We evaluated change in contraceptive use among women after exiting from a biomedical HIV prevention clinical trial in Kenya.

Methods The Partners in Prevention HSV/HIV Transmission Study enrolled HIV serodiscordant couples at 14 sites in East Africa and Southern Africa, including a site in Thika, Kenya. Participants were offered contraception free-of-charge at the research site during the clinical trial. Unblinding visits, at which the results of the trial were conveyed to participants, were conducted after the trial results were reported. Contraceptive use data were collected at the trial exit visit and at the later study unblinding visit.

Results Among 213 women from Thika in the trial, 114 returned for the unblinding visit, of whom 80 (70.2%) were HIV positive. The median time between exit and the unblinding visit was 1.11 years (ranging from 0.84—to 2.13 years). Non-barrier contraceptive prevalence (ie, use of oral, injectable, implantable contraceptives, intra-uterine devices [IUD] or surgical) dropped from 62.3% to 47.4% ($p=0.01$) between exit and unblinding visits: from 70.0% to 53.8%, ($p=0.03$) among HIV positive women and from 44.1% to 32.4%, ($p=0.31$) among HIV negative women. However, the prevalence of IUD use among the HIV positive women increased from 3.8% to 20%, ($p=0.002$) during this period. Additionally, the proportion of women who were using condoms as their sole contraceptive method decreased, from 29% at study exit to 1.8% at the unblinding visit ($p<0.0001$), resulting in greater numbers of women who were not using any contraceptive method.

Conclusions There was a high rate of contraceptive discontinuation, both hormonal and barrier methods, after women exited from a biomedical HIV prevention trial. Discontinuation of contraception may reflect participant fertility desires after trial procedures are completed, or may reflect loss of clinical and counselling services available during the study. Innovative strategies to support the contraceptive needs of women after exiting HIV prevention trials are urgently needed.

P1-S6.03 WHY ARE SO MANY OF OUR BIOMEDICAL AND BEHAVIOURAL PREVENTION TRIALS FAILING?

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Background With a few exceptions, most biomedical and behavioural randomised, controlled prevention trials have failed to demonstrate efficacy. The recently reported iPrEx Trial on pre-exposure prophylaxis, the Thai prophylactic vaccine trials and the CAPRISA 004 trial of a female-controlled microbicide demonstrated only modest protection from HIV acquisition in high-risk populations, although both attained statistical significance. Understanding why most trials fail is important to designing trials that may have greater success in the field.

Methods We conducted a desk review of all Phase III biomedical and behavioural prevention trials reported in the past 10 years, including

vaccines, microbicides, barrier methods, circumcision and behavioural prevention interventions, and assessed possible factors associated with success and failure to achieve anticipated outcomes.

Results Of the hundreds of prevention trials conducted over the past decade, only six reported significant findings, of which three were male circumcision trials, with one each for prophylactic vaccines, Truvada for PREP, and TDF+FTC microbicide gel. Most biomedical prevention trials rely on patient reports of adherence to use, and generally adherence is significantly lower than advised. Condom use among treatment arms are also usually lower than in control arms, which when linked with insufficient product use, leads to increased risk of disease acquisition. Repeated behavioural prevention counselling, HIV testing, STD detection and treatment all lead to diminished reports of risk behaviour among both intervention and control participants, diminishing the statistical power of the planned trials. IRB requirements may lead to control conditions that provide prevention services dramatically greater than is involved in "usual care". RCTs which randomise individuals can also lead to significant cross-exposure among treatment arms.

Conclusions Alternative to the RCT Conclusions: Design alternatives to the individual or community randomised controlled trial may be required in the future. Increased attention to improving adherence to recommended use of prevention approaches which must repeatedly conducted (eg, use of a microbicide before each sex act), and alternatives to enriching control conditions above that of usual care should be considered, while maintaining fidelity to ethical conduct of research.

P1-S6.04 EDUCATION AND LIFETIME RISK OF HIV INFECTION IN MANICALAND, ZIMBABWE

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Background There is evidence that attendance at school is protective against HIV among young people in South Africa. Further work is required to investigate the effect of education on the life-time risk of HIV in sub-Saharan Africa. In this paper, we have examined the association between education and HIV infection/sexual risk behaviour among men and women of different ages in Zimbabwe.

Methods The effects of education level (none or primary only; secondary or higher) on prevalent HIV infection and sexual risk behaviours among young people of school age (15–21 years) and older adults (22–54 years) were investigated using data from four rounds of an open cohort study collected between 1999 and 2008 in Manicaland, Eastern Zimbabwe. Multivariate regression models were used to investigate the independent effects of education, marriage and wealth.

Results School-aged men, interviewed in 1999/2000, with secondary or higher education had significantly reduced risk of HIV infection compared to those with none or primary education only (adjusted OR=0.35; p=0.011). For older men, the effect of education level was not significantly associated with HIV risk (adjusted OR=1.17; p=0.125). For those interviewed in 2006/2008, education level was not found to be independently associated with HIV infection among school-aged or older men. At both time points, marital status and living in a town were independent risk factors for HIV among older men. Among women interviewed in 1999/2000, adjusted models indicate that a higher level of education had a significant protective effect for school-aged (adjusted OR=0.64; p=0.023) and older (adjusted OR=0.80; p=0.017) women. For those interviewed in 2006/2008, a higher level of education level was protective among school-aged (adjusted OR=0.56; p=0.040) but not older (adjusted OR=0.99; p=0.940) women. Marital status was an independent risk factors for HIV infection for women of all ages.

Conclusions There is evidence that secondary or higher education is protective against HIV infection among school-aged people in Zimbabwe, particularly women. Among older men, education does not appear to be protective against HIV. In 1999/2000, secondary or higher education was protective against HIV among older women. However, in 2006/2008, this protective effect was reduced. Further work to calculate the lifetime cumulative risk of HIV infection by education level, in this population, will be conducted.

P1-S6.05 INFLUENCE OF SOCIAL SUPPORT NETWORKS ON THE HIV TRANSMISSION RISK BEHAVIOURS OF PEOPLE LIVING WITH HIV IN MANITOBA, CANADA

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For people living with HIV/AIDS (PLWHA) positive social support networks (SSNs) can help improve quality of life, overall well-being, coping, and decrease mood disturbance, morbidity, mortality, sexual and substance associated HIV transmission risk factors. However, HIV diagnosis can cause a negative change in SSNs leading to social isolation (actual/perceived) and increase risk of HIV transmission behaviours. Having an effective strategy to encourage the development/maintenance of SSNs may have a positive effect upon the health outcomes and HIV transmission risk behaviours of PLWHA.

Objective To describe the SSNs of Manitobans living with HIV/AIDS (MLHA) and determine the influence of SSNs on transmission risk behaviour. The relationship between independent variable (size and type of SSNs- positive/negative) and dependant variables (sexual risk behaviour, and alcohol, injection and non-injection drug use) was examined. Control variables included: age, gender, ethnicity, time since diagnosis, and sexual orientation. This data was collected in the Positive Prevention Study (PPS), a cross-sectional survey which included 135 MLHA aged 18 plus. The PPS assessed a broad list of transmission related determinants and only enrolled people if they were aware of their HIV diagnosis for at least 6 months, allowing for analysis of sustained positive behavioural changes. For this analysis SAS statistical software was used. Analysis of variance was done between the size and type (positive/negative) of SSNs and the chosen transmission risk behaviours; sexual behaviour, alcohol use, injection and non-injection drug use. Analysis of covariance was conducted with independent, dependent and control variables. Multiple regression analysis was run with independent and dependent variables to determine any relation. Level of social support achievable depends on one's attachment to those in their SSN and the role they play. It is not just the quantity of people but also the quality of relationships (eg, frequency, perceived support) that defines the success of SSNs. Not all SSNs are positive; some types may increase transmission risk behaviour. Only positive SSNs (regardless of size) are associated with avoidance of transmission risk behaviours. The results of this study help to assess the degree to which SSNs affect the sustainability of long-term secondary prevention measures, and thus inform groups offering services to MLHA with local scientific evidence.

P1-S6.06 WHAT HAS BEEN THE EFFECT OF THE AVAHAN HIV INTERVENTION ON CONDOM USE AMONG FEMALE SEX WORKERS? INSIGHTS FROM A FULLY BAYESIAN INFERENCE METHODOLOGY

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