Methods We adapted a previously published model of the impact and cost-effectiveness of 4vHPV to include the five additional HPV types in 9vHPV. The vaccine strategies we examined were (1) 4vHPV for males and females; (2) 9vHPV for females and 4vHPV for males; and (3) 9vHPV for males and females. In the base case, we assumed 9vHPV cost $13 more per dose than 4vHPV. Our model included a wide range of HPV-associated health outcomes that could potentially be averted by vaccination: cervical intraepithelial neoplasia; genital warts; juvenile-onset recurrent respiratory papillomatosis; and cervical, vaginal, vulvar, anal, oropharyngeal, and penile cancers

Results Compared to no vaccination, 4vHPV for both sexes cost $5,100 to $22,300 (in 2013 US dollars) per quality-adjusted life year (QALY) depending on assumptions regarding vaccine coverage and 4vHPV cross-protection against HPV 31, 33, 45, 52, and 58. Providing 9vHPV for females instead of 4vHPV was cost-saving in most scenarios we examined. The cost per QALY gained by providing 9vHPV to males instead of 4vHPV varied substantially depending on assumptions such as vaccine coverage and cross-protection of 4vHPV. However, the strategy of 9vHPV for both sexes (compared to the strategy of 4vHPV for both sexes) was cost-saving under most scenarios.

Conclusion A vaccination program of 9vHPV for both sexes can save money and improve health outcomes compared to a vaccination program of 4vHPV for both sexes.

Disclosure of interest statement The authors have no conflicts to declare. No pharmaceutical grants were received in the development of this study.

O16.5 HEALTH CARE ATTENDANCE AMONG ABORIGINAL YOUTH AGED 15–19 YEARS PROVIDES OPPORTUNITIES TO IMPROVE HUMAN PAPILLOMARUS VIRUS (HPV) VACCINATION COVERAGE

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10.1136/sextrans-2015-052270.169

Introduction A national school-based HPV vaccination program for 12–13 year olds was introduced in Australia in 2007 for females, and 2013 for males, with about 70% coverage achieved for 3-doses. However lower coverage has been reported in some states. In the context of an Aboriginal Sexual and Reproductive Health Program (2010–2014), we examined health care attendance among Aboriginal adolescents and young Aboriginal people attending Aboriginal Medical Services (AMSs) to determine clinical opportunities to offer HPV vaccination and HPV vaccination uptake.

Methods We extracted de-identified clinical data from 15–24 year old Aboriginal clients attending six AMSs between mid-2013 and mid-2014, and calculated total individuals attending, the median number of medical consultations per person and HPV vaccinations recorded. We used ranksum tests to compare medians.

Results Over 12 months, 1814 15–19 year old Aboriginal people attended (715 males, 1099 females), with similar proportions aged 15, 16, 17, 18 and 19 years in males and females. Among 15–19 year olds, there was a median of 4 consultations per person, higher in females (5, IQR: 2–11) than males (3, IQR: 1–5), $p < 0.001$. A similar number of 20–24 year olds attended (n = 1785), with a median of 5 consultations, higher in females (6, IQR: 3–13) than males (3, IQR: 1–6), $p < 0.001$. HPV vaccination was documented in the records of only three people, all 15 years old females (<2% all 15–19 yos).

Conclusion Despite concerns that many teenagers have poor health seeking behaviour, at six participating AMSs, we found that 15–19 year olds attend at a similar rate to 20–24 year olds, with females in both age groups attending more frequently. However, very few HPV vaccination doses were reported as given. Considering HPV vaccination is provided free at AMSs in NSW, these data highlight the need for better systems to support AMSs to identify incompletely vaccinated Aboriginal adolescents in addition to clinic-based prompts, reminders and feedback reports to raise clinician awareness.

Disclosure of interest statement The Aboriginal Sexual and Reproductive Health Program was funded by the New South Wales Ministry of Health.

O16.6 GENERAL PRACTITIONER AWARENESS OF SEXUAL ORIENTATION IN A COMMUNITY AND INTERNET SAMPLE OF GAY AND BISEXUAL MEN IN NEW ZEALAND: IMPLICATIONS FOR HPV VACCINATION

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10.1136/sextrans-2015-052270.170

Background General practitioners (GPs) can improve HIV and sexually transmitted infection (STI) screening and advice for gay, bisexual and other men who have sex with men (GBM) if they are aware of a patient's sexual orientation. We aimed to estimate GP awareness of their GBM patients' sexual orientation and examine whether HIV and STI screening was associated with this. These data will also inform policy debates about targeted catch-up HPV vaccination strategies for adult GBM.

Methods We analysed anonymous self-completed data from 3168 GBM who participated in the community-based Gay Auckland Periodic Sex Survey (GAPSS) and internet-based Gay men's Online Sex Survey (GOSS) undertaken in New Zealand in 2014. Participants were asked if their usual GP was aware of their sexual orientation or that they had sex with men.

Results Half (50.5%) believed their usual GP was aware of their sexual orientation/behaviour, 17.0% were unsure, and 32.6% believed he/she was unaware. In multivariate analysis, GP awareness was significantly lower if the respondent was younger, Asian or an "other" ethnicity, bisexual-identified, had never had anal intercourse or had first done so very recently or later in life, and had fewer recent male sexual partners. GBM whose GP was aware of their sexual orientation were more likely to have ever had an HIV test (91.5% vs 57.9%; AOR 6.6), specific STI tests (91.7% vs 68.9%; AOR 4.6), and were twice as likely to have had an STI diagnosed.

Conclusions Lack of sexual orientation disclosure is resulting in missed opportunities to reduce sexual health inequalities for GBM. This is despite over 20 years of anti-discrimination law and near complete legal equality. To address this, general practices should provide more proactive, inclusive and safe environments for sexual orientation minorities. Uptake of HPV vaccination among sexually-active GBM will be suboptimal unless communication about sexual orientation with GPs improves.

O17 - Basic science advances in HIV and HTLV-1

O17.1 HISTONE DEACETYLASE INHIBITORS ALTER THE ACCUMULATION OF CELL-ASSOCIATED SPLICED HIV MRNA – IMPLICATIONS FOR REACTIVATING THE RESERVOIR

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10.1136/sextrans-2015-052270.171

Background Clinical trials in HIV-infected patients on antiretroviral therapy with histone deacetylase inhibitors (HDACi) have demonstrated an increase in cell-associated unspliced (CA-US) HIV RNA, variable changes in plasma HIV RNA and no change in the number of latently infected cells. We aimed to define the effects of latency reversing agents (LRAs) on HIV mRNA splicing.

Methods Resting $CD4^+$ T cells isolated from the blood of HIV-negative individuals were treated with the chemokine CCL19 and infected with wild type $HIV^{NL4.3}$ to establish latency (n = 9). Latently infected CCL19-stimulated cells were then cultured with vorinostat, romidepsin, JQ1, romidepsin+JQ1 or PMA/PHA, all in the presence of an integrase inhibitor (L8). Cells and supernatant were harvested at 6, 24, 48, and 72 h. Reverse transcriptase (RT) was quantified in supernatant and CA-US and multiply spliced (MS) HIV RNA were quantified by real time qPCR.

Results In latently infected CCL19-treated $CD4^+$ T-cells, stimulation with PMA/PHA led to a significant exponential increase in both US-RNA and MS-RNA by 72 h and reached a mean fold increase above baseline of 34-fold for US-RNA and 54-fold for MS-RNA ($p = 0.0003$, $p = 0.0005$ respectively, relative to DMSO). In contrast, following stimulation with each LRA, there was only a modest increase in CA-US RNA that was not statistically significantly different from DMSO ($p = 0.89$). MS-RNA increased transiently (mean 1.65-fold change at 6hr with romidepsin) and then significantly declined over time with a reduction to 0.18-fold by 72 h relative to DMSO ($p = 0.008$ romidepsin compared to baseline) in the absence of any cellular cytotoxicity.

Conclusions In this *in vitro* model of latency, PMA/PHA and the potent HDACi romidepsin had strikingly different effects on the accumulation of US-RNA, MS-RNA and virus production. Changes in HIV RNA splicing may limit the efficacy of HDACi in activating latent HIV.

O17.2 CHARACTERISING CLADE-SPECIFIC VIRUS-HOST INTERACTIONS IN HIV INFECTED CLINICALLY ASYMPTOMATIC AND AIDS PRESENTING SUBJECTS

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10.1136/sextrans-2015-052270.172

Introduction The utilised co-receptor is indicative of the clinical progression in HIV infected subjects. Differences in clades are known to impact the outcome of HIV infection. In this study, we investigated the utilised co-receptor and N-glycosylation sites in clinically asymptomatic and AIDS presenting subjects.

Materials and methods A total of 1,538 nucleotide sequences encompassing the hyper-variable V3 loop of HIV-1, from clinically asymptomatic and AIDS presenting subjects were downloaded from the Los Alamaos Database, which belonged to clades A, B, C and D of HIV-1. Co-receptor prediction was performed using web-based tools *PSSM* and *(ds) Kernel*. Numbers of N-glycosylation sites were also calculated using the '*N-glycosite*' tool.

Results CCR5 was the utilised co-receptor in 97% (n = 200) of asymptomatic individuals of clade A and 96.5% (n = 199) of AIDS presenting subjects. In B-clade, 98.9% (n = 194) subjects in asymptomatic group were CCR5 utilising, and 83.5% of AIDS presenting subjects were CCR5 utilising (n = 163, CXCR4 were 22.3%, n = 47). In C-clade the CCR5 was utilised in 193 subjects (asymptomatic, n = 200), and 142 (AIDS presenting, n = 148) utilised both co-receptors (dual co-tropic), and in D clade the co-receptor utilised in 55% subjects was CCR5, n = 154 (CXCR4 in 45% subjects, n = 126), and 81% (n = 198) AIDS presenting subjects utilised CCR5, and 19% utilised CXCR4. Percentage of subjects exhibiting N-glycosylation sites also varied among clades with decrease in number of sites in some and increase in others, when compared between the two clinical categories.

Conclusions Co-receptor switching and addition of N-glycosylation sites does not seem to occur universally in all clades studied. The number of N-Glycosylation sites is also not increased from clinically asymptomatic to AIDS presenting subjects. In conclusion, co-receptor switching (from CCR5 to CXCR4) and increase in number of N-glycosylation sites, which are predictive of disease progression, does to occur in all clades universally, thus indicating clade specific responses.

O17.3 IL-4/IL-13 INHIBITOR VACCINES INDUCE PROTECTIVE IMMUNITY BY MODULATING INNATE LYMPHOCYTIC, DENDRITIC AND MACROPHAGE CELL SUBSETS AT THE VACCINATION SITE

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10.1136/sextrans-2015-052270.173

Introduction We have created two novel poxviral vector-based HIV vaccines that transiently inhibit IL-4/IL-13 activity at the vaccination site (murine IL-13Rα2 or IL-4R antagonist) that induce high avidity HIV-specific CD8 T cells with better protective efficacy. Compared to the IL-13Rα2 adjuvanted vaccine, the IL-4R antagonist adjuvanted vaccine induced not only high avidity CD8 T cells but also excellent gag-specific IgG1 and IgG2a antibody differentiation similar to what has been observed in HIV elite controllers. In this study, how IL-4/IL-13 differentially regulate T and B cell immunity following intranasal fowl poxvirus vector based vaccination were evaluated.

Methods BALB/c mice were immunised intranasally with recombinant fowl poxvirus co-expressing IL-13Ra2 or IL-4R antagonist adjuvanted together with HIV antigens and wt BALB/c and IL-4, IL-13 gene knockout (KO) mice with the unadjuvanted HIV vaccine. 24 h to 7 days post vaccination different innate lymphocytic cell (ILC) and antigen presenting cell subsets recruited to the vaccination site were evaluated using multi-colour flow cytometry.