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Abstracts of the Joint Australasian HIV&AIDS and Sexual Health Conferences

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Sexual Health – Social, Political and Cultural Aspects

1 '*I CAN GO IN AND GET FRESHIES BECAUSE IT IS HEALTHY FOR YOU AND MAKES YOU FEEL BETTER*': THE INCREASING ABORIGINAL PEOPLES' USE OF SERVICES THAT REDUCE HARMS FROM ILLICIT DRUGS PROJECT

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***Background*:** Injecting drug use and associated poor physical health outcomes, including higher risk of hepatitis C and HIV, are issues of concern among Indigenous Australians. Exploratory qualitative research with Aboriginal people in Western Australia who inject drugs (consumers) investigated what influences their use of needle and syringe programs (NSP), and identification of opportunities for health promotion/education and improved consumer engagement.

***Methods*:** An Aboriginal Advisory Group and a Co-Design Working Group were established, comprising four Elders, five Aboriginal consumers, and staff from 16 organisations including government, non-government, research, Aboriginal Community Controlled Health Services, peak bodies, and NSP services. NSP staff recruited and facilitated one-on-one yarning sessions with Aboriginal consumers exploring: barriers and enablers to accessing NSP services, cultural safety of NSPs, language used for drugs or equipment, reusing or sharing equipment, and where consumers access sterile equipment.

***Results*:** Twenty-one Aboriginal adult consumers (11 males, 10 females) participated in the yarning sessions. Findings included being street present (n = 8), supplying equipment to others (n = 13), reusing equipment (n = 15), sharing others' equipment (n = 8), sharing own equipment with others (n = 12), and using multiple NSPs (n = 12). Reasons for not accessing NSP services included shame, lack of anonymity, obtaining equipment from other consumers, locations and opening hours. Motivators for accessing NSPs included wanting to use sterile equipment, rapport with staff, referral by friends or family, incentives, free equipment, information, and support. Community education and raising awareness about harm reduction services, holistic models of service delivery, workforce education and training, increasing service availability, and a peer referral program were identified as intervention areas.

***Conclusion*:** Yarning sessions demonstrated that insight from Aboriginal consumers is essential for identifying the needs of themselves and their local drug using community, including interventions to improve access to NSPs. Interventions should be co-designed with Aboriginal consumers considering local needs, language, and service availability.

Disclosure of interest statement:
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2 OLDER WOMEN'S EXPERIENCES OF SEX WORK IN QUEENSLAND, PRE- AND POST-COVID-19

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***Background*:** Australia's ageing population extends into the sex work workforce. International studies show ageing in sex work is associated with declining earnings, and precarity affecting wellbeing. Sex workers have been at the forefront of Australia's successes in combatting the HIV epidemic and infectious diseases by encouraging safer sex behaviour, but little is known about the experiences of older sex workers within a legally regulated Australian context nor the impact of the COVID-19 pandemic on their circumstances and work practices.

***Methods*:** This qualitative study explores the impacts of COVID-19 on the circumstances and work practices of eight cisgender women aged 50–64 years, working in regional, urban and suburban settings in Queensland. Participants were recruited and interviewed as part of a broader study in 2019, and follow-up interviews were conducted in July–August 2020. Thematic analysis of transcripts identified how COVID-19 impacted and changed their circumstances and work practices.

***Results*:** Older women engage in sex work in diverse ways; work styles and practices are tailored to personal circumstances by weighing considerations in four domains: earnings/finances; health and safety; policing; and stigma. COVID-19, the consequential workplace and social restrictions, and government welfare programs introduced new considerations that impacted all four domains. Not all participants accessed support mechanisms and their responses included discontinuing sex work, interrupting and resuming sex work, or continuing to work throughout. The majority who continued work modified their work practices and undertook COVID Safe work training and a Queensland Sex Industry work plan developed in partnership with Respect Inc.

***Conclusion*:** Ongoing consultation with sex workers and sex worker organisations about the diversity of sex worker experiences is important for ensuring equitable and industry-appropriate policies, and to provide opportunities for the skills of this workforce to be recognised and strengthened to address the COVID-19 pandemic.

Disclosure of interest statement:
None of the authors have any conflicts of interest to be disclosed. The research is self-funded by the first named author, who receives a national research and training scholarship to cover tuition fees and a living allowance stipend during her PhD.

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3 LEARNING IN THE TIME OF COVID-19: ADAPTING SEXUAL HEALTH WORKFORCE EDUCATION TO THE ONLINE ENVIRONMENT

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***Background/Purpose*:** Before the COVID-19 pandemic, most of ASHM's workforce education was delivered face-to-face. Following restrictions on gatherings and travel, ASHM moved to entirely online education, requiring curricula and materials to be adapted to the online environment. ASHM's Sexual Health program adapted two courses: 'STI and BBV Nursing: An Introduction' and 'Sexual Health Update for Primary Care'.

***Approach*:** Adaptation was informed by the principle that adult learners are relevancy-oriented and self-directed. Working closely with ASHM's Medical Educator, we prioritised key messages within facilitated sessions and provided additional content as self-directed online learning. Interactive elements including quizzes and discussion questions were incorporated throughout to maintain engagement. Conscious that many learners would be joining from home with family nearby, we provided content warnings prior to displaying images of STIs' clinical presentation.

***Outcomes/Impact*:** The sexual health program delivered six online courses between May and August. The flexibility of the online environment meant that these courses had greater reach than if they had been delivered face-to-face. One online STI and BBV Nursing course educated over three times more nurses than a typical face-to-face course, and included nurses in rural and remote areas who often have limited access to professional development. Learners have provided overwhelmingly positive feedback on the online format, praising the accessibility, interactivity, engagement and use of technology.

***Innovation and significance*:** Delivering sexual health education online allows ASHM to reach more health professionals across a larger geographic region compared to face-to-face education. This is a significant benefit, particularly when the rates of many STIs are increasing while opportunistic screening has reduced due to COVID-19. However, online learning is unable to replicate all of the benefits of face-to-face education, including informal networking. In a post-COVID-19 world, face-to-face education will return; ASHM has an opportunity to ensure online sexual health education remains available alongside it.

Disclosure of interest statement:
The authors have no conflicts of interest to declare.

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Sexual Health – Clinical Management and Therapeutics

4 ENTERIC AND SEXUALLY ACQUIRED PATHOGENS IN MEN WHO HAVE SEX WITH MEN WITH CLINICAL PROCTITIS

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***Background*:** Rectal infections are common in men who have sex with men (MSM) and may increase HIV risk. This study aimed to determine enteric and sexually acquired rectal pathogens among MSM presenting with non-chlamydial, non-gonococcal proctitis and to compare these with MSM without proctitis.

***Methods*:** This was a retrospective study performed on stored anorectal swab samples obtained from MSM attending Melbourne Sexual Health Centre between January 2017 and March 2019. We identified anorectal samples from MSM with a clinical diagnosis of proctitis where anorectal NAAT was negative for *Neisseria gonorrhoeae* and *Chlamydia trachomatis*. Anorectal samples from MSM with no proctitis symptoms were used as a comparison group. Samples were NAAT tested for viral, bacterial and protozoal enteric pathogens using the AusDiagnostics Faecal Pathogen M 16-well assay and STIs using the Resistance Plus® MG for *Mycoplasma genitalium* and PlexPCR® VHS for HSV-1, HSV-2 and *Treponema pallidum*.

***Results*:** Anorectal samples from 499 men with symptomatic proctitis and 507 asymptomatic men were analysed. Among men with proctitis, 38% were HIV negative and taking HIV PrEP and 16% were HIV positive. *Shigella* was detected more frequently among men with proctitis compared to asymptomatic men (n = 14, 2.8% [95% CI: 1.5–4.7%] vs 1.0% [95% CI: 0.3–2.3%]; P <0.001). Most men with proctitis and *Shigella* did not report diarrhoea. *T. pallidum* was more common in men with proctitis (n = 18, 3.6% [95% CI: 2.2–5.6%] vs 0% [95% CI: 0–0.7%]; P <0.001). Most men with anal *T. pallidum* presented with painful anal primary infections. Also more common among men with proctitis were: *M. genitalium* (9.4% [95% CI: 7.0–12.3%] vs 5.2% [95% CI: 3.4–7.4%]; P = 0.009) and HSV-1 and HSV-2 (17.4% [95% CI: 14.2–21.1%] vs 3.7% [95% CI: 2.6–6.3%]; P <0.001).

***Conclusion*:** Testing for *Shigella* and *T. pallidum* should be considered in MSM presenting with symptomatic proctitis. These data support an aetiological role for *M. genitalium* in proctitis.

Disclosure of interest statement:
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5 ORAL AND ANAL *T. PALLIDUM* DETECTION IN MEN WHO HAVE SEX WITH MEN WITH EARLY INFECTIOUS SYPHILIS: A CROSS-SECTIONAL STUDY

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***Background*:** This study of men who have sex with men (MSM) with early syphilis determined the frequency of *Treponema pallidum* shedding from potentially asymptomatic sites and the stage with the most frequent shedding.

***Methods*:** Primary and secondary syphilis lesions were swabbed. Non-lesion samples collected were oral rinse, oral cavity swab, anal canal swab, urine, and semen. Specimens were tested for *T. pallidum* using polymerase chain reaction assays targeting *polA* and *47kDa* gene targets.

***Findings*:** Two hundred men with serologically confirmed early syphilis were included: 54 (27%) primary, 93 (46.5%) secondary and 53 (26.5%) early latent cases. *T. pallidum* DNA was detected orally in 48 (24%; 95% CI: 18.3–30.5%) men by oral rinse and/or oral lesion swab, 24 with no oral lesion. Oral *T. pallidum* detection was most frequent during secondary syphilis compared to other stages, (44% (41/93) versus 7% (7/107), P <0.0001); and in men with rapid plasma reagin titres ≥1:64 (32% (37/117) versus 13% (11/83), $P = 0.0026$). *T. pallidum* was detected by anal canal swab and/or anal lesion swab in 45/196 (23%; 95% CI: 17.3–29.5%) men, 10 with no anal lesion. Seventy-four percent (69/93) of men with secondary syphilis had *T. pallidum* detected at any site: 26% (24/93) had detection at ≥2 separate sites. *T. pallidum* was detected in 6% (12/198) of urine and 12 (6/50) of semen samples tested.

***Interpretation*:** Unrecognised oral and anal shedding of *T. pallidum* may be a factor in sustaining syphilis transmission. Secondary syphilis may be the most infectious stage, with oral transmission possibly being important. Control should focus on early testing and treatment to prevent progression to secondary syphilis.

Disclosure of interest statement:
All authors declare no competing interests.

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6 ANTISEPTIC MOUTHWASH FOR GONORRHOEA PREVENTION (OMEGA): A RANDOMISED, DOUBLE-BLIND, PARALLEL-GROUP, MULTICENTRE TRIAL

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***Background*:** To address the increasing incidence of gonorrhoea and concern regarding antimicrobial resistance, we compared the efficacy of Listerine™ and Biotène™ mouthwashes for preventing gonorrhoea among men who have sex with men (MSM).

***Methods*:** The OMEGA trial was a multicentre, parallel-group, double-blind randomized controlled trial among MSM conducted at four sexual health and one GP clinic in Australia. Men were eligible if they were diagnosed with oropharyngeal gonorrhea in the last month or were aged 16–24 years. Men were randomised to the intervention (Listerine) or control (Biotène) group via a computer-generated sequence. Participants were instructed to use the mouthwash daily for 12 weeks. Oropharyngeal swabs were collected every 6 weeks and saliva samples every 3 weeks and tested for *Neisseria gonorrhoeae* with nucleic acid amplification test (NAAT). The primary outcome was detection of oropharyngeal *N. gonorrhoeae* over the 12-week period, defined as a positive result for either an oropharyngeal swab or saliva sample by NAAT. A modified intention-to-treat analysis for the primary outcome was conducted which included men who provided at least one follow-up specimen over the 12-week study period. The trial was registered on the Australian and New Zealand Clinical Trials Registry (ACTRN12616000247471).

***Results*:** Between 31 March 2016 and 26 October 2018, 264 MSM were randomly assigned to the Biotène group, and 266 to the Listerine group. The analysis population included 227 (86.0%) men in the Biotène group and 219 (82.3%) in the Listerine group. Oropharyngeal gonorrhoea was detected in 4.4% (10/227) of MSM in the Biotène group compared with 6.8% (15/219) in the Listerine group (adjusted risk difference = 2.5%; 95% CI: -1.8%–6.8%).

***Conclusion*:** Listerine did not reduce the incidence of oropharyngeal gonorrhoea compared to Biotène. Future studies should investigate different types of mouthwashes, methods of administering them, placebo preparations, and also determine if mouthwash use could potentially reduce transmission to sex partners.

Disclosure of interest statement:
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Sexual Health – Prevention, Epidemiology and Health Promotion

7 INCIDENCE AND DURATION OF INCIDENT OROPHARYNGEAL GONORRHOEA AND CHLAMYDIA INFECTIONS AMONG MEN WHO HAVE SEX WITH MEN: A PROSPECTIVE COHORT STUDY

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***Background*:** This prospective cohort study aimed to determine the natural history and incidence of oropharyngeal gonorrhoea and chlamydia among a cohort of men who have sex with men (MSM) over a 12-week period, and to examine risk factors associated with incident oropharyngeal infections.

***Methods*:** MSM either aged ≥18 years and had a diagnosis of oropharyngeal gonorrhoea by nucleic acid amplification test (NAAT) in the last three months; or aged 18–35 years who were HIV-negative taking PrEP were eligible for this study. Enrolled men were followed for 12 weeks. Oropharyngeal swabs were collected at week 0 (baseline) and week 12 (end of study). Between these timepoints, weekly saliva specimens and the number of tongue-kissing, penile-oral and insertive rimming partners were collected by post. Oropharyngeal swabs and saliva specimens were tested by NAAT for *Neisseria gonorrheae* and *Chlamydia trachomatis*.

***Results*:** The incidence of oropharyngeal gonorrhoea and chlamydia was 56 (95% CI: 30–94) and 4 (95% CI: 1–32) per 100 person-years, respectively. The estimated median duration of oropharyngeal gonorrhoea infection was 28 days (IQR 21–36) and chlamydia was 14 days (IQR 10–17). The incidence rate ratio (IRR) for oropharyngeal gonorrhoea increased with increased number of kissing partners (IRR 1.08; 95% CI: 1.03–1.12; $P = 0.001$) and increased number of penile-oral sex partners (IRR 1.07; 95% CI: 1.01–1.14; $P = 0.016$) but not with increased number of insertive rimming partners (IRR 1.11; 95% CI: 0.95–1.29; $P = 0.175$) or other demographic factors. The IRR for oropharyngeal chlamydia was not calculated due to small number of cases ($n = 2$).

***Conclusion*:** Incident oropharyngeal gonorrhoea was associated with tongue-kissing and penile-oral sex partners but not insertive rimming. MSM have a high incidence of oropharyngeal gonorrhoea and the infection is short-lived (i.e. 28 days), suggesting some infections may be missed with three-monthly screening.

Disclosure of interest statement:
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8 GOANNA SURVEY 2: THE SECOND NATIONAL SEXUAL HEALTH SURVEY FOR ABORIGINAL AND TORRES STRAIT ISLANDER YOUNG PEOPLE

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***Background*:** The GOANNA Survey is a periodic sexual health survey specifically designed for Aboriginal and Torres Strait Islander young people. GOANNA Survey 2 has recently been completed (September 2017–January 2020). The aim was to gather current information on knowledge, risk behaviours and health service access for STIs and blood borne viruses (BBVs).

***Methods*:** Participants aged 16–29 years were recruited at community events and completed anonymous questionnaires on hand-held tablets. Aboriginal organisations partnered in the project, with staff trained as survey coordinators and local community members recruited as peer survey collectors.

***Results*:** Over 1300 participants were recruited from urban, regional and remote areas of Australia. Sexual identity was more diverse than the first GOANNA survey (2011–13). Eighty percent of respondents were sexually active. Major sexual risks included inconsistent condom use (60% reported no condom at last sex compared to 46% in first GOANNA survey) and sex while drunk or high (27%). Mobile phone apps were used by 28% to find partners. While 70% of sexually active respondents had been tested for STIs, only 42% of 16–19 year olds reported being offered STI testing during their last health check compared to 70% of 20–24 year olds and 74% of 25–29 year olds. Self-reported STIs were common (17% of sexually-active respondents). BBV testing had declined since the first survey, with only 33% ever tested for HIV and 32% for hepatitis C. Aboriginal medical services were preferred for sexual health advice, health checks, STI/BBV testing and help for alcohol and drug use.

***Conclusion*:** The GOANNA Survey is now established as an ongoing program of research to gather social and behaviour data and monitor long term trends in order to support policies and health interventions targeting STIs and BBVs in Aboriginal and Torres Strait Islander communities.

Disclosure of interest statement:
No conflicts of interest to disclose.

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9 PATIENT DELIVERED PARTNER THERAPY FOR CHLAMYDIA: VIEWS OF AUSTRALIAN GENERAL PRACTITIONERS

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***Background*:** Patient delivered partner therapy (PDPT) refers to the process in which antibiotic treatment for chlamydia infection is prescribed or provided to the index case to give to their sexual partner/s. PDPT is effective in expediting partner treatment and reducing reinfections. We investigated the use of and perceptions towards PDPT for chlamydia among general practitioners (GPs) working in Australia.

***Methods*:** During 2019, we conducted an online survey of 323 GPs and semi-structured telephone interviews with 24 GPs across Australia about their chlamydia management practices, including PDPT. Descriptive statistics were used to examine quantitative data, and thematic analysis applied to qualitative data.

***Results*:** Over half (53.4%) of survey respondents reported that they never offered PDPT, while 36.6% sometimes did and 10.0% often offered PDPT. A higher proportion of GPs from Australian states with some PDPT guidance reported offering PDPT (52.6%; 95% CI: 44.9–60.2) than GPs from states without guidance (36.8%; 95% CI: 27.6–46.7). In both the survey and interviews, GPs described potential benefits of PDPT including improved treatment and clinical outcomes, reduced reinfection risk and access to treatment for hard-to-reach people. However, most GPs indicated it was preferable for partners to be consulted directly to allow testing and prevention education as well as treatment. Barriers to PDPT included concern about allergies and medication interactions, potential medicolegal implications in treating a person they had not seen, and that PDPT is unsuitable for some patients and their partners. Many GPs were uncertain about the practicalities of PDPT and indicated a need for professional and regulatory guidance that PDPT is permissible as well as clinician, patient and partner resources to support its use.

***Conclusion*:** Despite the acknowledged benefits of PDPT, further work from professional and regulatory bodies is needed to support GPs to feel confident to include PDPT as an option for partner management.

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The authors declare no conflicts of interest. The research on which this abstract is based forms part of the Management of Chlamydia Cases in Australia (MoCCA) project, funded by a NHMRC Partnership Grant (APP1150014).

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10 SEXUALLY TRANSMITTED INFECTION SYNDROMES AND ACCESS TO SEXUAL HEALTH SERVICE BEFORE AND AFTER THE NATIONAL LOCKDOWN FOR COVID-19 IN MELBOURNE, AUSTRALIA

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***Background*:** Australia introduced a national lockdown from late March to early May due to the COVID-19 pandemic, which included measures restricting travel, closure of non-essential businesses, physical distancing and stay home restrictions, which may have influenced an individual's sexual practice. We aimed to examine the reason for attending a public sexual health service and the diagnoses of sexually transmitted infection (STI) syndromes before and after lockdown in Melbourne.

***Methods*:** This was a cross-sectional study conducted at the Melbourne Sexual Health Centre (MSHC) from January to June. MSHC remained open during lockdown. Incidence rate ratio (IRR) was calculated by Poisson regression to compare the number of consultations and STI diagnoses and syndromes four weeks before and after lockdown.

***Results*:** The total number of consultations dropped from 4197 to 2431 four weeks before and after lockdown (IRR = 0.58; 95% CI: 0.55–0.61) with the greatest reduction in females (IRR = 0.43; 95% CI: 0.39–0.47), followed by males (IRR = 0.65; 95% CI: 0.61–0.69). However, this number began to rise after 3–4 weeks of lockdown. The number of asymptomatic screening dropped from 1327 to 407 (IRR = 0.31; 95% CI: 0.27–0.34). The number of contact of infections dropped from 292 to 194 cases (IRR = 0.66; 95% CI: 0.55–0.80) and the number of sex work certificates issued dropped from 50 to 3 (IRR = 0.06; 95% CI: 0.02–0.19). Urgent cases with more mild conditions showed a marked reduction, including non-gonococcal urethritis (IRR = 0.64; 95% CI: 0.52–0.80), bacterial vaginosis (IRR = 0.51; 95% CI: 0.38–0.69) and candidiasis (IRR = 0.66; 95% CI: 0.49–0.90). Urgent cases with more severe conditions showed a less marked reduction and did not change significantly, including pelvic inflammatory disease (IRR = 0.81; 95% CI: 0.43–1.53), primary syphilis (IRR = 0.74; 95% CI: 0.37–1.47) and secondary syphilis (IRR = 1.71; 95% CI: 0.67–4.35).

***Conclusion*:** There were significant reductions in asymptomatic screening at the beginning of lockdown but this started to rise after 3–4 weeks of lockdown. Milder STI conditions reduced more than severe conditions, suggesting healthcare seeking was influenced by the seriousness of the condition.

Disclosure of interest statement:
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Sexual Health – Discovery and Translational Science, Biology, Resistance and Pathogenesis

11 A CUSTOM AMPLICON SEQUENCING APPROACH TO DETECT RESISTANCE ASSOCIATED MUTATIONS AND SEQUENCE TYPES IN *MYCOPLASMA GENITALIUM*

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***Background*:** *Mycoplasma genitalium* resistance to antibiotics is increasing, for both macrolides (first line) and fluoroquinolones (second line), with very limited treatment alternatives on the horizon. Surveillance via sequencing of multiple *M. genitalium* loci would allow: monitoring of known antibiotic resistance mutations, associations between resistance/treatment failure and specific mutations, and strain typing for epidemiological purposes. In this study we assessed the performance of a custom amplicon sequencing approach, which negates the cost of library preparation for next generation sequencing (NGS).

***Methods*:** Fifty-two *M. genitalium* positive samples (cervical, vaginal, anal and rectal swabs, and urine) were used. Three regions associated with *M. genitalium* antibiotic resistance (23S rRNA, *parC* and *gyrA* genes) were targeted, in conjunction with a locus used for differentiation of sequence types in the *mgpB* gene, and findings compared to Sanger sequencing.

***Results*:** Amplicon sequencing provided adequate sequence read coverage (>30x) for the majority of samples for 23S rRNA gene (96%) and *mgpB* (97%), *parC* (78%) and *gyrA* (75%). Single nucleotide polymorphisms (SNPs) were characterised in samples for 23S rRNA gene (94%), parC (56%) and gyrA (4%). Unlike Sanger sequencing, mixed mutations could be identified by the amplicon sequencing method, and ratios of mutation types determined. All results, with one exception, were concordant to Sanger sequence results. Sequence diversity in the *mgpB* region was represented by 15 sequence types, 4 being observed in multiple samples. No clear association between antibiotic resistance SNPs and *mgpB* sequence types was determined.

***Conclusion*:** The utility of this custom amplicon sequencing approach for generating highly informative datasets with the capacity to identify and determine ratios of mixed sequences is demonstrated. The use of this customisable amplicon sequencing method enables cost effective, scalable amplicon sequencing of multiple target regions of interest in *M. genitalium*.

Disclosure of interest statement:
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12 THE IMPACT OF PARTNER TREATMENT FOR BACTERIAL VAGINOSIS ON THE GENITAL MICROBIOTA OF HETEROSEXUAL COUPLES

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***Background*:** More than 50% of women experience recurrence of bacterial vaginosis (BV) within 3–6 months following first-line antibiotics. Increasing evidence suggests that reinfection from an untreated regular sexual partner contributes to BV-recurrence. We conducted a pilot study of combined oral and topical antibiotic treatment of male partners of women being treated for BV, and investigated the impact of concurrent partner treatment on the genital microbiota of couples.

***Methods*:** Women attending Melbourne Sexual Health Centre with symptomatic BV (≥3 Amsel criteria and Nugent Score = 4–10) were recruited between March 2018–2019 with their regular male partner (RSP). Women received first-line BV-treatment and their RSP received oral metronidazole 400mg *BD* and 2% clindamycin cream topically to penile skin *BD,* for 7 days. Couples self-collected genital samples (vaginal swab, penile skin swab, and male first-pass urine [representing the urethral microbiota]) immediately post-treatment (i.e. day-8) and then 4-weekly for up to 12-weeks. Specimens underwent microbiota analysis using 16S-rRNA gene sequencing. Changes in the relative abundance of bacteria between pre- and post-treatment specimens were assessed using the Wilcoxon rank-sum test.

***Results*:** Data from 31 couples was available for microbiota analysis. The bacterial composition of the male genital microbiota differed at the penile skin site and the urethral site. Partner treatment reduced the relative abundance of BV-associated bacteria in the genital microbiota of both men and women immediately post-treatment. Specifically, *Prevotella* and *Sneathia* were reduced at the vaginal (P <0.001), penile skin (P = 0.005) and urethral (P <0.001) sites post-treatment compared to pre-treatment. Post-treatment, *Gardnerella* was reduced in the urethral (P = 0.02) and vaginal (P = 0.001) microbiota, and not in the penile skin microbiota but this was likely due to the low relative abundance of *Gardnerella* at this site.

***Conclusions*:** Treating sexual partners of women with BV reduces the abundance of BV-associated bacteria in the vaginal, penile skin and male urethral microbiota immediately post-treatment.

Disclosure of interest statement:
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13 GENOMIC ASSESSMENT OF WITHIN-HOST POPULATION VARIATION IN *NEISSERIA GONORRHOEAE*: IMPLICATIONS FOR GONORRHOEA TRANSMISSION

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***Background*:** Mathematical modelling and genomic analyses are powerful methods for investigating transmission dynamics of *N. gonorrhoeae*; however often make the implicit assumption that *N. gonorrhoeae* isolates at different anatomical sites within the same individual are the same strain.

***Methods*:** In this study, we used two approaches to explore genetic diversity. First, we examined a collection of stored *N. gonorrhoeae* isolates sourced from multiple anatomical sites of single individuals attending a sexual health clinic in Melbourne from 2011–2019. Second, we obtained multiple colony picks from primary plates of clinical samples from individuals attending a sexual health clinic in Melbourne from 2019–2020. Whole genome sequencing and a variety of bioinformatics approaches were used to determine both within-host and within-sample genetic diversity.

***Results*:** Thirty-seven individuals were identified that had cultured *N. gonorrhoeae* from two or more anatomical sites (urogenital, anorectal, or oropharyngeal), with a final dataset of 105 isolates. In 35/37 (94.6%) individuals, infections were highly similar at the genetic level, with identical multi-locus sequence types (MLST) and multi-antigen sequence types (NG-MAST). Comparisons of isolates within each individual indicated that the maximum within-host pairwise SNP distance was 13 SNPs (median = 1, IQR: 0–3). Notably, four distinct multi-individual phylogenetic clusters were identified, where the maximum pairwise SNP distance was 19 SNPs (median = 6, IQR = 2–11). Similarly, comparisons of isolates within each sample indicated that the maximum within-sample pairwise SNP distance was 8 SNPs (median = 2, IQR:1–3).

***Conclusion*:** This study suggests that in most cases, the same strain of *N. gonorrhoeae* causes infection at multiple anatomical sites. However, WGS data alone cannot differentiate between the same infecting strain or (re)infections from the same transmission network. These data guide recommendations regarding optimal bioinformatic approaches to infer genetic relatedness *of N. gonorrhoeae* and will help inform future studies of gonorrhoea transmission and epidemiology.

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HIV – Prevention, Epidemiology and Health Promotion

14 DECLINING HIV DIAGNOSES AND RISING PREP UPTAKE IN AUCKLAND, NEW ZEALAND: SUCCESSES AND CHALLENGES

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***Background*:** Gay, bisexual and other men who have sex with men (GBM) are a key population for PrEP in New Zealand. Auckland has the country's largest GBM population and launched the earliest PrEP programme in 2017. We assessed the impact of PrEP in this city by examining trends in HIV diagnoses and casual sex behaviours.

***Methods*:** To examine HIV transmission trends, we utilised HIV epidemiological surveillance 2010–2019 for GBM infected in New Zealand and living in Auckland, disaggregated by CD4 count, age and ethnicity. To explore behavioural patterns we analysed online behavioural surveillance surveys (2011, 2014) and annual online Ending HIV surveys (2016–2019). Behavioural analyses were limited to non-positive Auckland participants engaging in anal intercourse with casual partners, categorised as: No condomless anal intercourse (No CLAI); PrEP; CLAI tested for HIV <6 months; CLAI tested for HIV >6 months; CLAI never tested. Findings were disaggregated by age, ethnicity and partner numbers.

***Results*:** There were 376 HIV diagnoses over 10 years; 24 in 2010 rising to 63 in 2016 then declining to 26 in 2019, a 59% decrease. Half (48%) were recent infections (CD4 >500), declining from 32 in 2014 to 6 in 2018 and 12 in 2019. The proportion recently infected did not differ by year, ethnicity or age. Between 2011–2019, of 1962 participants, No CLAI declined from 55%–21%; PrEP rose from 0%–30%; CLAI never tested reduced from 11%–5%. Combined PrEP or No CLAI remained stable (55%–51%); some on PrEP still used condoms. Overall, participants ever testing rose 73%–91% and those testing <6 months increased 33%–61% (statistically significant after adjusting for age). PrEP coverage was greater among participants aged 30+ or with more sexual partners; HIV testing indicators were better among non-Māori.

***Conclusion*:** Ecological analyses suggest HIV incidence has declined in Auckland since PrEP, consistent with changes in HIV prevention coverage but equity gaps remain.

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15 LARGE DIFFERENCES IN DISCONTINUATION OF PBS-SUBSIDISED PREP IN AUSTRALIA: EVALUATION USING NATIONAL PRESCRIPTION DATA

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***Background*:** Findings from the EPIC-NSW PrEP cohort show that the strongest predictors of PrEP failure are non-adherence, particularly stopping PrEP. We used Australian government prescription data to determine the rate and predictors of discontinuation in the two years since Pharmaceutical Benefits Scheme (PBS) listing.

***Methods*:** From linked de-identified records of all dispensed PBS-subsidised PrEP between April 2018 and March 2020, we used date and quantity dispensed to determine days covered by PrEP, assuming daily dosing. We determined if over the last 90 days patients were: on PrEP (any days covered) or potentially discontinued (no days covered). Patient demographics, PBS concessional entitlement, year of initiation, PrEP caseload (number of patients prescribed PrEP by each prescriber) and estimated prevalence of gay-identified men in patient and prescriber postcode were used to compare rates of potential discontinuation and predictors of time from initiation to discontinuation.

***Results*:** Over two years, 35 965 patients were dispensed PBS-subsidised PrEP (median age 35yrs, 523 women (1.4%)). Over the last 90 days, 25 282 were on PrEP, including 3169 initiations. Of the 10 683 who had potentially discontinued, the median time from initiation to discontinuation was 274 days (IQR: 169–414) and 4311 (40.4%) were dispensed PrEP only once. Large differences in the rate of potential discontinuation were observed among subgroups: gender (73.5%: women, 33.8%: men, HR = 3.87 (P <0.001)), age (43.1%: <30yrs, 28.8%: 40+yrs, HR = 1.49 (P <0.001)), PBS entitlement (37.7%: concessional, 33.9%: ordinary, HR = 1.14 (P <0.001)), year of initiation (36.2%: year two, 33.7%: year one, HR = 1.89 (P <0.001)), PrEP caseload of the patient's prescriber (60.9%: caseload = 1, 27.7%: caseload >100, HR = 2.05 (P <0.001)), prevalence of gay men in patient postcode (41.8%: lowest, 25.8%: highest, HR = 1.65 (P <0.001)), and in prescriber postcode (51.8%: lowest, 25.7%: highest, HR = 1.90 (P <0.001)). All of these factors, with the exception of concessional entitlement, were independently associated with discontinuation.

***Conclusion*:** The large differences in discontinuation among subgroups require urgent investigation. This information can inform strategies to protect individuals and achieve elimination of HIV transmission.

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16 DEPRESSION AND ANXIETY IN AUSTRALIAN GAY AND BISEXUAL MEN PRIOR TO AND DURING COVID-19 RESTRICTIONS

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***Background*:** In response to COVID-19, Australian governments introduced physical distancing measures in late March. We examined depression and anxiety prior to and during COVID-19 restrictions in a cohort of gay and bisexual men (GBM).

***Methods*:** Flux is an ongoing prospective cohort since 2014 of Australian GBM involving 6-monthly online surveys. In April 2020, 940 participants responded to questions about COVID-19. During 2019, and again in April 2020, 681 men completed the Patient Health Questionnaire (PHQ-9, measuring depression) and Generalised Anxiety Disorder Assessment (GAD-7, measuring anxiety). Increased depression and anxiety were defined as a ≥5 point increase on the respective scales.

***Results*:** PHQ-9 (mean = 5.98, SD = 5.93) and GAD-7 (mean = 4.54, SD = 4.95) scores remained stable between 2014 and 2019. Mean PHQ-9 increased to 6.56 (SD = 6.03) in 2020 ($P = 0.004$). Almost one in five participants ($n = 121$, 17.8%) increased ≥5 points on the PHQ-9; in these men, mean PHQ-9 score increased from 4.11 (SD = 4.21) in 2019 to 12.78 (SD = 5.61) in 2020 ($P < 0.001$). Mean GAD-7 score increased to 4.96 (SD = 5.07) in 2020 ($P = 0.015$). 104 participants (15.3%) increased ≥5 points on the GAD-7; within these men, mean GAD-7 score increased from 3.46 (SD = 3.83) in 2019 to 11.15 (SD = 4.85) in 2020 ($P < 0.001$). Factors associated with increased depression/anxiety included: concerns about losing employment ($P < 0.001$ / $P = 0.005$) and avoiding social venues ($P = 0.025$ / $P = 0.002$). Increased depression was associated with avoiding sex ($P = 0.020$) and having less casual sex ($P = 0.043$), while concerns about contracting COVID-19 ($P = 0.024$) and fears about an overwhelmed health system were associated with increased anxiety ($P = 0.003$).

***Conclusion*:** A substantial minority of GBM experienced significant declines in mental health following the introduction of COVID-19 restrictions. Both anxiety and depression were associated with more general COVID-19-related concerns, but there was a particular association between reduced sexual connection and depression.

Disclosure of interest statement
The Kirby Institute and Centre for Social Research in Health are funded by the Australian Government Department of Health. Flux received funding from the Australian Research Council and the NSW Ministry of Health. In 2018, Flux was partly funded by the Gilead Australia Fellowship Research Grants Program. Gilead had no input in the data collection, analysis, interpretation, or presentation of any findings.

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17 PREP BECOMES MOST COMMON HIV PREVENTION STRATEGY USED BY GAY AND BISEXUAL MEN IN AUSTRALIA AND 'NET PREVENTION COVERAGE' INCREASES: RESULTS OF REPEATED, NATIONAL BEHAVIOURAL SURVEILLANCE, 2014–19

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***Background*:** The combination prevention era raises the possibility that sexual transmission of HIV can be eliminated in Australia. We analysed trends in condoms, pre-exposure prophylaxis (PrEP) and undetectable viral load (UVL) and the proportion of gay and bisexual men (GBM) protected by any of these strategies ('net prevention coverage').

***Methods*:** National data from the Gay Community Periodic Surveys were included. Trends and characteristics of men who were 'at risk' of HIV (HIV-negative or untested GBM not on PrEP who had condomless anal intercourse with casual partners, CAIC) were analysed using multivariate logistic regression, controlling for demographic and behavioural variables.

***Results*:** 32,048 responses from GBM with casual sex partners were included. GBM reporting no anal intercourse decreased from 18.0% in 2014 to 14.8% in 2019 (P <0.001). Consistent condom use decreased from 44.6% to 23.2% (P <0.001). The other groups all reported CAIC and changed as follows: HIV-positive GBM who had a detectable viral load decreased (1.6% to 0.6%, P <0.001) while GBM who were HIV-positive and had a UVL increased (4.8% to 5.8%, P = 0.002); GBM who were HIV-negative on PrEP increased (0.7% to 31.1%, P <0.001), while the 'at risk' group decreased in size from 30.3% to 24.5% (P <0.001). Net prevention coverage increased from 68.1% to 74.9% (P <0.001). The 'at risk' group became more likely to identify as bisexual (7.2%–9.5%), be born overseas (24.2%–30.2%), be recently tested for HIV (61.6%–68.5%) and have CAIC with partners on PrEP (21.4%–33.9%) or UVL (9.6%–14.9%). They reported more frequent CAIC but fewer male partners over time.

***Conclusion*:** PrEP has replaced condoms as the most common prevention strategy used by GBM in Australia. Net prevention coverage has increased through rising PrEP use and UVL, while consistent condom use has declined. GBM not on PrEP appear to have become less at risk of HIV over time. This creates conditions conducive to falling HIV infections.

Disclosure of interest statement:
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18 HIV-1 EPIDEMIOLOGY AND SUBTYPE DIVERSITY IN THE AUSTRALIAN-BORN AND NEWLY-ARRIVED ASIAN-BORN MSM POPULATIONS IN VICTORIA, AUSTRALIA 2015–2018

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***Background*:** Notified cases of HIV-1 among gay and bisexual men (GBM) in Victoria decreased by 33% between 2016 and 2018 while the proportion of total incident cases diagnosed among newly-arrived Asian-born GBM increased. To improve our understanding of locally-acquired HIV transmission and inform prevention and response strategies, we aimed to characterise the epidemiology and subtype diversity of HIV-1 in Australian-born and newly-arrived Asian-born GBM in Victoria.

***Methods*:** Data included were from newly-diagnosed HIV cases notified to the Victorian Department of Health and Human Services, 1 January 2015 to 31 December 2018 who: were Australian-born or newly-arrived Asian-born GBM (≤4 years before HIV diagnosis), reported country of HIV acquisition, and had HIV subtyping data available. Subtyping data from the Victorian Infectious Diseases Reference Laboratory were linked to notification records.

***Results*:** The study included 267 Australian-born and 104 newly-arrived Asian-born GBM. Of the nine HIV-1 subtypes observed in Australian-born GBM, subtype B predominated (79%), followed by CRF01_AE (12%). In newly-arrived Asian-born cases, subtype CRF01_AE was the most common (47%) followed by subtype B (40%). There was no significant change in the proportion of B and non-B subtypes in either Australian-born ($P = 0.76$) or newly-arrived Asian-born ($P = 0.66$) GBM over time. Subtype B represented 40% of infections in Asian-born cases who reported local acquisition compared to 29% of those with overseas acquisition. Non-B subtypes represented 58% of infections in Australian-born GBM with overseas acquisition compared to 21% of those who acquired it locally.

***Conclusion*:** Victoria is characterised by significant HIV-1 viral diversity but dominated by the B subtype. The substantial proportion of locally acquired non-B infections (particularly CRF_01AE) in Australian-born GBM, and subtype B in newly-arrived Asian-born GBM as well as the greater proportion of locally acquired infections in newly-arrived Asian-born GBM suggests sexual mixing and ongoing local HIV transmission between these two populations.

Disclosure of interest statement:
No interests to declare.

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HIV – Clinical Management and Therapeutics

19 IMPACT OF ROSUVASTATIN ON PROGRESSION OF ATHEROSCLEROSIS IN PEOPLE WITH HIV AT MODERATE CARDIOVASCULAR RISK: A MULTICENTRE, RANDOMISED, DOUBLE BLIND, PLACEBO-CONTROLLED TRIAL

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***Background*:** People with HIV (PWHIV) are at increased risk for cardiovascular disease. This study aimed to determine if PWHIV would benefit from starting statins at a lower threshold than currently recommended in the general population.

***Methods*:** A double-blinded multicentre, randomised, placebo-controlled trial was performed. Participants were adults with well controlled HIV at moderate cardiovascular risk (Framingham risk score of 10–15%) who were not recommended to be on statin therapy. They were recruited from HIV centres in Australia and Switzerland. Participants were randomised 1 : 1 to rosuvastatin 20mg oral daily or matched placebo for 96 weeks stratified by site. Detailed assessments including fasting bloods and carotid intima media thickness (CCA-IMT) were performed at baseline, and weeks 48 and 96. The primary outcome was the change from baseline to week 96 in CCA-IMT.

***Results*:** Participants (n = 88) were randomised to rosuvastain (n = 44) or placebo (n = 40) from July 2013 to August 2016. They were predominantly male (82 (97·6%)); mean age 54 years (SD 6.0). At 96 weeks there was no difference in the change CCA-IMT between the rosuvastatin (mean 0.004mm, SD 0.0036) and placebo (0.0062mm, SD 0.0039) arms (P value = 0.684), leading to no difference in CCA-IMT levels between groups at week 96 (rosuvastatin arm, 0.7232mm (SD 0.030); placebo arm 0.7785mm (SD 0.032), P = 0.0749). Adverse events were common (n = 146) but mostly mild, grade one or two (131 [89%]) but were more common in the rosuvastatin arm (108 [73.9%]) vs placebo (38 [26.0%]). Participants on rosuvastatin were more likely to cease study medication due to an adverse event (12 [27.2%] vs 2 [5.0%]).

***Conclusion*:** The prescription of statins to people with HIV at a lower threshold than general population guidelines did not lead to improvements in surrogate markers of cardiovascular disease but was associated with a significant rate of adverse events.

Disclosure of interest statement:
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20 LONGER TERM SAFETY OF F/TAF AND F/TDF FOR HIV PREP: DISCOVER TRIAL WEEK 96 RESULTS

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***Background*:** DISCOVER, a double-blind, randomized-controlled trial, compared F/TAF to F/TDF, demonstrating noninferior efficacy for HIV prevention, and improved bone mineral density (BMD) and renal biomarkers at week (W)48. We now report W96 safety outcomes.

***Methods*:** We evaluated renal and lipid parameters and weight changes in participants on F/TAF vs F/TDF. BMD was evaluated in younger participants (<25 years). We examined glomerular function, proteinuria, and renal biomarkers (PTI; β2M/Cr, RBP/Cr) in participants ≥50 years and those with moderate renal impairment (eGFR 60–<90 mL/min).

***Results*:** Among 5387 participants F/TAF (n = 2694) users had significantly increased BMD, the magnitude of between-group differences increasing between W48 to W96. Participants <25 years had greater declines in BMD on F/TDF with a greater magnitude of difference between groups than those ≥25 years. Overall, F/TAF users had increases in eGFR and declines in UPCR and PTI biomarkers. Older F/TDF users had greater declines in eGFR and greater increases in UPCR and PTI markers compared to younger users. Similarly, those on F/TDF with eGFR 60–<90 mL/min had greater changes in PTI markers compared with those with eGFR ≥90 mL/min. F/TAF users had stable lipids through W96, whereas F/TDF users had decreases. Those on F/TDF had a smaller weight increase than those on F/TAF through W96.

***Conclusions*:** DISCOVER allows for the largest single-variable comparison of the tenofovir prodrugs without underlying HIV infection and in the absence of third antiretrovirals. Overall, those on F/TAF had increased BMD compared to declines in F/TDF users, with more pronounced differences in younger participants. Older participants on F/TDF and those with impaired renal function had more adverse impact on renal biomarkers. Lipid and weight changes were consistent with the known lipid-lowering and weight suppressive effects of TDF. F/TAF is a safe, longer-term option for PrEP, with certain subgroups experiencing greater benefits in BMD and renal biomarkers.

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21 SUSTAINED VIRAL SUPPRESSION AMONG PARTICIPANTS WITH PRE-EXISTING M184V/I WHO SWITCHED TO BICTEGRAVIR/EMTRICITABINE/TENOFOVIR ALAFENAMIDE

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***Background*:** Pre-existing resistance can affect antiretroviral therapy efficacy in people living with HIV. One of the most common treatment-emergent resistance substitutions is M184V/I. This substitution can be transmitted, archived in the viral reservoir, and reactivated, even when genotyping shows wild-type virus. Studies 1844, 1878, 4030, 4449, and 1474 demonstrated the safety and efficacy of switching stably suppressed HIV-1-infected individuals to bictegravir/emtricitabine/tenofovir alafenamide (B/F/TAF). In this pooled analysis, we investigated the prevalence of pre-existing M184V/I and impact on virologic outcomes.

***Methods*:** Participants enrolled were aged ≥18 years (studies 1844, 1878, and 4030), ≥65 years (study 4449), or 6 to <18 years (study 1474). Pre-existing drug resistance was assessed by historical genotypes and/or retrospective proviral DNA genotyping (GenoSure Archive® assay, Monogram Biosciences). Virologic outcomes were based on last available on-treatment HIV-1 RNA, where early discontinuation with HIV-1 RNA <50 copies/mL was considered suppressed.

***Results*:** Altogether, 1545 participants switched to B/F/TAF and were treated for 24 to 144 weeks. Cumulative baseline genotypic data from historical and/or proviral genotypes were available for 88% (1356/1545). Pre-existing M184V/I was detected in 9.7% (132/1356) of participants: by proviral genotyping only (83%, 109/132), historical genotype only (9%, 12/132), or both (8%, 11/132). At baseline, participants with pre-existing M184V/I were 15–78 years old. At the time of analysis (≥24 weeks of B/F/TAF treatment), 98% (129/132) of participants with pre-existing M184V/I were suppressed compared to 99% (1528/1545) of the overall B/F/TAF study population. No B/F/TAF-treated participant developed new drug resistance.

***Conclusions*:** Pre-existing M184V/I was detected in nearly 10% of suppressed participants' baseline genotypes, the majority of which was previously undocumented. High rates of virologic suppression in participants who switched to B/F/TAF, and the absence of treatment-emergent resistance, indicate B/F/TAF may be an effective and durable treatment for suppressed patients with archived M184V/I.

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HIV – Social, Political and Cultural Aspects

22 WHY TRUST DIGITAL HEALTH? KEY INFORMANT PERSPECTIVES ON THE PROMISE AND RISKS OF DIGITAL HEALTH FOR PRIORITY POPULATIONS IN THE AUSTRALIAN HIV AND STI RESPONSE

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***Background*:** Despite extensive government investment in expanding digital health systems, minimal research has documented community views on these systems in Australia. And there has been almost no research on the perspectives of populations affected by blood-borne viruses (BBVs) and sexually transmissible infections (STIs). The Trust in Digital Health study was conducted by CSRH in collaboration with community organisations representing four of the priority populations in the current national BBV/STI strategies: people with HIV, trans and gender diverse people, sex workers, and gay and bisexual men.

***Methods*:** We conducted qualitative phone/computer interviews with 16 key informants holding expertise in policy, advocacy, education, research and health promotion across one or more of the priority populations and/or in relation to digital health. The purpose of the interviews was to identify key issues in engaging these communities with digital health systems, and a thematic analysis was conducted of deidentified transcripts.

***Results*:** In addition to specific issues for priority populations, participants commonly argued that trust in digital health was affected by (1) the pervasive and persistent stigma and discrimination experienced in health care settings, (2) the criminalisation of particular behaviours related to HIV, sex work, and drug use, and (3) the potential for personal information, particularly about stigmatised or pathologised identities or practices, to be shared without the knowledge or consent of the affected person. Meaningful consultation, law reform, inclusive system design, and mechanisms for community members to control data access were proposed as essential for increasing trust.

***Conclusion*:** Community stakeholders offered many reasons that populations affected by BBV and STIs may be reluctant to engage with, and therefore realise the promise of, digital health. In addition to driving new technological innovations, resources must be directed towards remediating the social, cultural, and political issues that continue to marginalise some communities from participating in digital health systems.

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23 CHANGES IN HIV-POSITIVE MEN'S RELATIONSHIPS IN THE BIOMEDICAL PREVENTION ERA: AN ANALYSIS OF AUSTRALIAN BEHAVIOURAL SURVEILLANCE DATA, 2014–2019

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***Background*:** The vast majority of HIV-positive gay and bisexual men (GBM) in Australia have undetectable viral loads (UVL), posing no risk of onward HIV transmission. Increased uptake of pre-exposure prophylaxis (PrEP) has further reduced HIV acquisition risk for HIV-negative GBM. We investigated whether increased use of biomedical prevention was associated with changes in HIV-positive men's relationships and sexual practices.

***Methods*:** National data from the Gay Community Periodic Surveys were included. We analysed the trends (multivariable logistic regression) and characteristics of HIV-positive participants' serodiscordant versus seroconcordant partnerships (binary logistic regression).

***Results*:** During 2014–19, 4388 surveys were completed by HIV-positive GBM (8.6% of the whole sample). The proportion receiving antiretroviral therapy (ART) increased from 85.3% to 95.5% (aOR = 1.21, P <0.001). Serodiscordant relationships were reported by 48.6% of HIV-positive GBM in relationships in 2014 and 57.4% in 2019 (aOR = 1.07, P = 0.280). Agreements that required condoms to be used within relationships became less common (20.7% to 8.1%, aOR = 0.83, P <0.001). Condomless anal intercourse (CAI) became more common in serodiscordant regular relationships (49.4% to 68.1%, aOR = 1.12, P = 0.045), and in 2019, 43.7% of HIV-positive GBM with serodiscordant regular partners reported that those partners were taking PrEP. CAI also became more common with casual partners (from 41.5% to 62.1%, aOR = 1.15, P = 0.002). HIV-positive GBM in serodiscordant and seroconcordant relationships generally reported similar characteristics, although men in serodiscordant relationships were more likely to have been together for less than two years (aOR = 0.33, P <0.001).

***Conclusion*:** As ART and UVL have increased among HIV-positive GBM, and PrEP uptake has increased among HIV-negative GBM in Australia, HIV-positive GBM have become more likely to engage in CAI with serodiscordant regular partners and with any casual partners. Increased reliance on biomedical HIV prevention strategies has coincided with HIV-positive GBM reporting more diverse relationship experiences and sexual practices.

Disclosure of interest statement:
The Centre for Social Research in Health and the Kirby Institute receive funding from the Australian Government Department of Health. The Gay Community Periodic Surveys are supported by state and territory health departments and surveillance funding from the Australian Government Department of Health. No pharmaceutical grants were received for this study.

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24 '*IT HAS NEVER SEEMED RELEVANT*' – TRANS AND GENDER DIVERSE AUSTRALIAN'S RESPONSES TO HIV

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***Background*:** Despite being recognised as a key population at risk for HIV, there is a paucity of research dedicated to trans and gender diverse (TGD) people within the HIV response. Positive Life NSW and The Gender Centre conducted a TGD needs assessment in collaboration with TGD community members to identify the healthcare and social needs of TGD people living with HIV (PLHIV) or at risk of acquiring HIV.

***Methods*:** Between June and September 2019, $n = 699$ respondents were recruited through social media for a national online anonymous survey, with TGD people central to its development and implementation. The survey asked open and closed questions about demographics, access and experience of healthcare settings, gender affirming hormones and surgery experience, sexual health literacy, mental health, housing, employment, discrimination, and preferred TGD-specific future research directions.

***Results*:** Participants included trans men (21.5%), trans women (40.3%), gender diverse people assigned female at birth (22.2%) and assigned male at birth (16%). 2.8% were PLHIV and 13.8% were HIV unknown. While many respondents showed literacy in HIV awareness, 9.1% of participants reported no HIV screening in six or more years, while 40.1% reported never undertaking HIV screening. Half of all respondents (54.8%) were aware of Pre-Exposure Prophylaxis (PrEP) and Post Exposure Prophylaxis, and only 3.3% were taking PrEP. Respondents identified numerous HIV testing and care barriers, and gaps in knowledge potentially contributed to low rates of HIV awareness and screening among these respondents. Participants reported significant concerns about stigma and discrimination in healthcare settings.

***Conclusion*:** Findings showed HIV risk awareness and HIV testing was low. TGD people require targeted resources and communication about HIV. Respondents felt safe and comfortable discussing sexual health within trans-inclusive clinics, with peer workers/clinicians knowledgeable of TGD medical care and sexuality, non-judgmental and respectful. The survey results will be used to develop educational resources.

Disclosure of interest statement:
Nothing to declare.

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HIV – Discovery and Translational Science, Biology, Resistance and Pathogenesis

25 RNA-DIRECTED EPIGENETIC SILENCING PROTECTS HUMANISED MICE DURING HIV CHALLENGE

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***Background*:** The HIV-1 latent reservoir is maintained by specific epigenetic modifications, such as increased histone methylation and decreased histone acetylation. Using RNA-directed epigenetic silencing to induce and enforce super-latency, we aim to mimic natural virus latency in an HIV-1 functional cure 'block and lock' approach. We have previously shown novel siRNAs induce potent HIV-1 silencing in various cell lines *in vitro* and provide protection from virus challenge in a humanized mouse model of **acute** HIV-1 infection. We now investigate their potential for gene therapy using shRNA-transduced CD34+ haematopoietic stem cells in a humanized mouse model of **chronic** HIV-1 infection.

***Methods*:** Human CD34+ cells were transduced using GFP-labelled lentivirus expressing the promoter-targeted shRNA, shPromA or dual construct shPromA/shCCR5 or mock-transduced or empty shRNA-transduced and transplanted into irradiated NSG mice. Transduction efficiencies ranged between 40–70%. At 17 wks post-engraftment mice expressing GFP in ~4000 CD4+ T cells/mL were challenged with CCR5-tropic HIV-$1_{JR\text{-}FL}$. Mice were bled at wks 3, 5, 7 and 10 post-infection (p.i.), and then received ART for 8 wks, following which ART was interrupted to measure virus rebound for 4 wks prior to sacrifice and assessment of CD4+ T cells/GFP expression by flow cytometry and viral load using RT-PCR.

***Results*:** Transduced mice expressing shPromA or dual shPromA/shCCR5 showed up to 90% CD4+ GFP expression, with means of ~30–40%, respectively, over wks 3, 5 and 7 p.i. This correlated with a decrease in viraemia in transduced mice vs mock at wks 3, 5 and 7, between 1 and 3 logs, depending on the individual mouse CD4+ GFP expression. Transduced mice also showed a >1 log increase in CD4+ T cell numbers compared to mock at 10 wk p.i. in spleen, bone marrow and blood. RNAscope and immunostaining of lymph nodes is currently underway.

***Conclusion*:** Preliminary data from this study demonstrates RNA-directed epigenetic silencing by shPromA/shCCR5 delivered by *ex vivo* gene therapy can protect against HIV-1 in a humanized mouse model.

Disclosure of interest statement:
CA, AK and GS hold siRNA patents. GS is an employee of CSL. All other authors report no conflict of interest.

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26 LACTIC ACID PRODUCED BY AN OPTIMAL VAGINAL MICROBIOTA PROMOTES CERVICOVAGINAL EPITHELIAL BARRIER INTEGRITY: IMPLICATIONS FOR HIV TRANSMISSION

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***Background*:** Women with a *Lactobacillus spp*.-dominated vaginal microbiota have a decreased risk of HIV acquisition compared to women colonized with 'non-optimal' vaginal microbiota, the latter being associated with decreased cervicovaginal epithelial barrier integrity. Lactic acid (LA) is a key metabolite of *Lactobacillus spp*. with antimicrobial and anti-inflammatory properties that is differentially produced by *Lactobacillus* species as L- and D- isoforms. However, the impact of LA in promoting epithelial barrier integrity through modulation of junctional molecules is unknown.

***Methods*:** Cervicovaginal epithelial (Ect) cells were cultured in a transwell system and treated apically for 1 h with 0.3% L-LA or D-LA (pH 3.9), or acidity alone (pH 3.9, HCl adjusted). Transepithelial electrical resistance (TEER) across the cell monolayer was determined prior to and 24 h post-treatment to measure epithelial barrier integrity. Expression of junctional molecule mRNA after L or D-LA treatment was determined by RNASeq and qRT-PCR, and protein levels were determined by Western blot.

***Results*:** Treatment of Ect cells with L- or D-LA significantly increased TEER by 1.5-fold ($n = 4$; $P < 0.05$), in contrast to pH control treatment. RNASeq and gene ontology enrichment analysis were consistent with the TEER functional data demonstrating that L- and D-LA caused significant differential expression (FDR <0.05) of at least 11 genes associated with intracellular junctions and barrier function, including claudin-1 (CLDN1, Log_2 fold change L-LA 1.12/ D-LA 1.17), claudin-4 (CLDN4, Log_2FC 1.47/1.63) and occludin (OCLN, Log_2FC 0.49/0.55), with no differential gene expression between isoforms. These findings were confirmed by qRT-PCR. In addition, tight junction protein levels were significantly increased by L-LA treatment (CLDN1 FC = 1.56, TJP2 FC = 1.42) but not with the pH control ($n = 5$; $P < 0.05$).

***Conclusion*:** LA significantly increases cervicovaginal epithelial barrier integrity by increasing the expression of junctional molecules, which has implications for the paracellular penetration of HIV through cervicovaginal tissue and subsequent HIV acquisition.

Disclosure of interest statement:
G.T. and A.H. are co-inventors on patent applications on the anti-inflammatory effects of LA on cervicovaginal epithelium (Patent Application AU201501042 and US Patent Application 20150306053). The remaining authors declare no conflict of interest.

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27 DIFFERENTIAL EXPRESSION OF HIV ENVELOPE EPITOPES ON THE SURFACE OF HIV-INFECTED MACROPHAGES AND CD4+ T CELLS

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***Background*:** HIV-infected macrophages contribute to the persistence of HIV reservoirs in the tissues of people living with HIV on antiretroviral therapy. One potential targeting strategy is the use of antibody-dependent cellular cytotoxicity (ADCC) against infected cells expressing the HIV envelope (Env) protein on the surface. ADCC strategies require the characterisation of exposed Env epitopes and identifying antibodies capable of opsonising them, yet little is known regarding the susceptibility of HIV-infected macrophages to be targeted using this strategy.

***Methods*:** Monocytes purified from HIV-seronegative donors were cultured into monocyte-derived macrophages (MDM) for 5 days. MDM and activated peripheral blood mononuclear cells (PBMC + IL-2, 10 IU/mL) were then infected *in vitro* with the R5-tropic HIV BaL strain for 7–10 days and 3–4 days respectively. MDM were analysed using flow cytometry and fluorescence microscopy to assess productive infection (intracellular HIV p24), and surface expression of Env (using antibodies targeting different epitopes); which was then compared to the expression of Env on CD4+ T cells from PBMCs.

***Results*:** Our results reveal potential differences in epitope expression on macrophage- and T cell-expressed Env. Notably, HIV_{BaL}-infected macrophages were more susceptible to opsonisation by NIH45-46 and 17b antibodies (median = 37.2% and 28.2% respectively) compared to infected T cells (median = 15.4% and 2%; $P = 0.002$ and 0.004 respectively), which were susceptible to opsonisation by PG16 (median = 27.2%) compared to MDM (median = 7.9%, $P = 0.004$). Furthermore, some neutralising antibodies used were ineffective at opsonising cell-surface Env, indicating that it may be presented differently to Env on cell-free virions.

***Conclusion*:** Here we show that HIV-infected macrophages may display a distinct surface Env epitope profile compared to infected T cells. The differential Env epitope expression between macrophages and T cells suggest that cell-type dependent differences alter binding of anti-Env antibodies. This impacts the efficacy of antibody-mediated targeting approaches and will inform the development of future cure strategies.

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