

Diagnoses of blood-borne viruses and other sexually transmitted infections in a sample of 356 sex workers attending a sexual health outreach clinic in Auckland over a two-year period

Sunita Azariah

ABSTRACT

AIM: We aimed to describe demographics and rates of diagnoses of blood-borne viruses and other sexually transmitted infections (STBBI) in sex workers attending an outreach clinic in Auckland.

METHODS: Sex workers attending an outreach clinic in Auckland from 31 December 2018 to 31 December 2020 were eligible for inclusion. Gonorrhoea and chlamydia rates in sex workers were compared to rates in two comparator groups: attendees to general sexual health clinics and a population-based sample.

RESULTS: Three hundred and fifty-six sex workers were eligible for inclusion. The majority were cisgender-gender females (93.5%, n=333). Test positive rates for chlamydia (5.1%) and gonorrhoea (3.9%) in cisgender-female sex workers were lower than for females attending general sexual health clinics. Chlamydia and gonorrhoea rates were higher in transgender-female sex workers than in cisgender-female sex workers, but the numbers were small (n=14). Of the 159 sex worker participants tested for hepatitis C antibody, 25 were antibody positive (15.7%).

CONCLUSIONS: Cisgender-female sex workers had lower rates of diagnosis of chlamydia and gonorrhoea than females attending general sexual health clinics. STBBI testing in sex workers should routinely include assessment and testing for hepatitis C. The data indicate that sex workers should continue to be a priority population in the STBBI strategy.

Sex workers are a designated priority population in the Aotearoa New Zealand Sexually Transmitted and Blood Borne Infection (STBBI) Strategy¹ as they have been identified as a group experiencing inequities in this area. The illicit nature of sex work in many countries renders sex workers vulnerable to exploitation and can be a barrier to effective health promotion and risk-reduction activities. A United Kingdom review of STBBIs in sex workers identified a number of structural factors that could contribute to increased STBBI risk, including illicit drug use, gender identity, stigma, criminalisation and enforcement-based approaches.² In 2003 New Zealand passed the *Prostitution Reform Act (PRA)*, which was intended to enable sex workers to have the same protections afforded to people employed in other types of work and to create an environment to protect the human rights, public health and the occupational safety and health of sex workers. A study in 2007 concluded that there had been many

positive outcomes from the implementation of the *PRA* and there was little or no evidence of negative consequences for the health and safety of sex workers following decriminalisation.³

The NZPC: Aotearoa New Zealand Sex Workers' Collective (NZPC) was founded in 1987 by sex workers as an organisation seeking equal rights for people engaging in sex work, and it provides a range of services with a particular focus on HIV and AIDS prevention. A pilot study of 20 sex workers commissioned by the NZPC in 1991 found that sex workers had high levels of knowledge and awareness of HIV/AIDS, and this was accompanied by extensive use of condoms with clients.⁴ However there are very little available data on STBBI diagnoses in New Zealand sex workers to help guide future policy and risk-reduction activities.

There were two aims for this study. The first was to describe demographics and frequency of diagnoses of STBBIs in a sample of Auckland sex workers. The second was to compare rates of

diagnoses of chlamydia and gonorrhoea in sex workers to two comparator groups, which were attendees to Auckland Sexual Health Service (ASHS) general sexual health clinics and a population-based sample.

Methods

ASHS provides secondary-level sexual health services to the greater Auckland Region, including a weekly nurse-led outreach clinic located at the NZPC offices in central Auckland. Serology for HIV and syphilis and testing for chlamydia and gonorrhoea is offered to all people requesting or requiring a sexually transmitted infection (STI) screen. Screening for viral hepatitis is offered selectively based on disclosure of specific risk factors. Multiple anatomical sites may be tested for gonorrhoea and chlamydia depending on sexual practices and behaviour, including the oropharynx, vagina and ano-rectum. All pharyngeal and rectal swabs are dual tested for chlamydia and gonorrhoea, and vaginal swabs are also tested for trichomoniasis. (Trichomoniasis testing data have not been included).

Diagnostic tests performed at ASHS clinics are all processed at the Auckland City Hospital laboratory (LabPLUS). This study is reporting on laboratory data that were collected during the period from 31 December 2018 to 31 December 2020.

Gonorrhoea test positive rates and chlamydia test positive rates were compared across three different comparator groups:

1. Sex workers attending the ASHS NZPC clinic during the study period
2. Attendees to ASHS general clinics for STI testing during the study period
3. A population-based sample derived from laboratory testing data for chlamydia and gonorrhoea in the Auckland Region

Inclusion criteria—sex worker sample

Sex workers who had attended the NZPC clinic during the study period were eligible for inclusion. Attendees who were not sex workers or who were not at risk of STI through their work (e.g., sensual massage only) were excluded. Demographic data were collected from the electronic patient management system including age, sex and ethnicity. As the patient's registered sex is not always concordant with gender identity, the notes for each participant were checked to correctly assign gender. Ethnicity was categorised as: New Zealand or other European, Māori, Pacific, Asian, Other

(African, Latin American/Hispanic, Middle Eastern) and not stated or specified. Laboratory test results for the following STBBIs were collated for each participant over the study period: chlamydia, gonorrhoea, syphilis, HIV, hepatitis B (HBV) and hepatitis C (HCV). Clinic records of people with reactive syphilis serology were reviewed to determine if the reactive test represented a new infection, as syphilis serology usually remains reactive for life following treatment. If HBV testing had not been requested during the relevant time period, results of previous serological testing were reviewed to check for previous immunity or infection as per standard clinical practice to reduce unnecessary testing or vaccination. Notes were also reviewed for documentation regarding methamphetamine or injecting drug use (IDU).

STBBI test positive rates were calculated by dividing the total number of positive tests taken during the study period by the total number of requested tests in the same time period. Individuals could have multiple tests for gonorrhoea and chlamydia collected from different anatomical sites on a single visit, so the denominator for the gonorrhoea and chlamydia testing data was the total number of tests requested, not individuals tested. Data were entered into a password-protected Microsoft Excel spreadsheet and stored in a password-protected computer.

Inclusion criteria—ASHS general clinic attendees

Gonorrhoea and chlamydia laboratory quarterly testing data are routinely provided by the hospital laboratory in the form of password-protected Excel spreadsheets. These include the following variables: date of test, unique national health identifier (NHI), date of birth (DOB), patient sex, anatomical site of test and test result for each site tested. Testing data from people who had attended ASHS general clinics during the study period were included in the analysis. Sex and age data for ASHS general clinic attendees were derived from the testing data. Due to the large numbers involved it would have been too logistically challenging to manually review each individual health record for ethnicity and gender; therefore, ASHS general clinic volumes data from 2019 and 2020 for priority populations were used to give some limited comparative data for gender, ethnicity and sexual behaviour.

Gonorrhoea and chlamydia testing data for quarter two of 2020 were not able to be accessed for unknown technical reasons, so testing data from 2020 only included results from available

quarters one, three and four. LabPLUS was not routinely supplying serological testing data for HIV, syphilis and viral hepatitis during that time period, so blood-borne infection (BBI) testing data for general ASHS clinic attendees were not included in the analysis.

Inclusion criteria—population-based sample

These data were derived from population-based anonymised chlamydia and gonorrhoea laboratory testing data for the Auckland Region during the 2019 and 2020 time periods. These data are collated by the New Zealand Institute for Public Health and Forensic Science (PHF Science) and mainly reflect testing in primary care. The data were provided by personal communication from Putu Duff, PHF Science.

Safety and data monitoring

Due to sensitivity of the data, the study was conducted under the guidance of a small, informal committee that included ASHS clinical staff and

representatives of NZPC.

Ethics review

The study was approved by the Health and Disability Ethics Committee (reference 2023 EXP 13385).

Results

Demographics

NZPC cohort

There were 356 eligible participants who attended the NZPC clinic during the study period. The age range of participants was 20 to 61, with a median age of 31. The majority were cisgender-females (93.5%; n=333), with 14 transgender-females, seven cisgender-males and two transgender-males. The majority identified as New Zealand or other European (n=152; 42.7%), 62 identified as Māori (17.4%), 87 as Asian (24.4%), 15 as Pacific (4.2%) and 38 as Other (10.7%). Ethnicity was not stated for two participants (Table 1).

Table 1: Demographics.

NZPC: Aotearoa New Zealand Sex Workers' Collective (NZPC) cohort N=356	Auckland Sexual Health Service (ASHS) 2019 testing data No. of tests=24,434	ASHS 2020 testing data No. of tests=16,325*
Age range 20–67 Median 31	15–87 37	14–84 31
Gender Female 333 (93.5%) Male 7 (1.9%) Transgender-male 2 (0.005%) Transgender-female 14 (3.9%)	Sex Female 4,398 (18.0%) Male 20,008 (82.0%)	Sex Female 2,909 (18.0%) Male 13,391 (82.0%)
Ethnicity	ASHS volumes data for priority populations Total visits=31,755	ASHS volumes data for priority populations Total visits=25,658
Māori 62 (17.4%) European 152(42.7%) Asian 87 (24.4%) Pacific 15 (4.2%) Other 38 (10.6%) Not stated 2 (0.6%)	Māori 4,434 (15.3%) Pacific 3,362 (10.6%) Gay or bisexual men (GBMSM) 11,630 (36.6%) Transgender 1,385 (4.4%)	Māori 3,461 (13.5%) Pacific 2,865 (11.1%) GBMSM 9,079 (35.3%) Transgender 1,063 (4.1%)

*Quarter two data missing.

ASHS general clinic attendees

The age range of those tested for gonorrhoea and chlamydia in 2019 was 15–87 in 2019 (median age 37) and 14–84 in 2020 (median age 31) (Table 1). Clinic volumes of people attending ASHS general clinics were 20% lower in 2020 (n=25,658) than in 2019 (n=31,755) due to the COVID-related lockdowns that occurred during 2020 in Auckland. In 2019, 4,434 of clinic visits to ASHS general clinics were for people of Māori ethnicity (15.3%) and 3,362 were for people of Pacific ethnicity (10.6%). The data for 2020 were similar, with Māori accounting for 13.5% of clinic visits and Pacific people for 11.1% of clinic visits. The NZPC sample had a higher proportion of Māori participants (17.4%) and a lower proportion of Pacific participants (4.2%) when compared with encounter volumes data for those attending ASHS general clinics (Table 1). Gay and bisexual men (GBMSM) accounted for over a third (n=11,630; 36.6%) of clinic visits in both 2019 and in 2020 (n=9,079; 35.3%). Transgender people accounted for a similar proportion (n=1,385; 4.4%) of clinic visits

in 2019 and in 2020 (n=1,063; 4.1%). However, transgender people mainly access ASHS for gender-affirming healthcare so not all visits would have been due to STI-related concerns.

Chlamydia testing results

NZPC cohort

There were 1,429 chlamydia and gonorrhoea tests requested from the 365 NZPC participants during the study period (Table 2). All participants were tested at least once during the study period; some were tested multiple times. Over 90% of tests at NZPC were requested in cisgender-females. The overall test positive rate was 4.9%. Transgender-female sex workers had a higher chlamydia test positive rate (7.4%) than cisgender-female sex workers (5.1%).

ASHS general clinic attendees

In 2019, there were 24,434 chlamydia and gonorrhoea tests requested in individuals attending ASHS general clinics, and there were 16,325 tests requested in 2020 in quarters one, three and four.

Table 2: Chlamydia test results.

NZPC: Aotearoa New Zealand Sex Workers' Collective (NZPC) clinic	Auckland Sexual Health Service (ASHS) general clinics 2019/2020*	Public Health and Forensic Science (PHF Science) sexually transmitted infection surveillance data 2019/2020
No. tests by gender N (%)	No. tests by sex N (%)	No. tests by sex N (%)
Female 1,342 (91.4%) Male 46 (3.2%) Transgender-female 67 (4.7%) Transgender-male 9 (0.63%) Total 1,429 (100%)	Female 7,307 (18.0%) Male 33,399 (80.0%) Total 40,706 (100%)	Female 230,849 (67.7%) Male 110,264 (32.3%) Total 341,113 (100%)
Positive tests by gender N (%)	Positive tests by sex N (%)	Positive tests by sex N (%)
Female 66 (5.1%) Male 1 (2.1%) Transgender-female 5 (7.4%) Transgender-male 0 (0%) Total 72 (4.9%)	Female 660 (9.0%) Male 1,857 (5.6%) Total 1,509 (6.2%)	Female 14,544 (6.3%) Male 8,578 (7.8%) Total 23,122 (6.8%)

*Quarter two ASHS lab data not available.

(As stated previously, 2020 data were incomplete as no data were available from quarter two). In contrast to the NZPC clinic, over 80% of tests requested at ASHS general clinics were requested in males (Table 2). The chlamydia test positive rates for females (9.0%) attending ASHS general clinics were higher than that of males (5.6%). They were also higher than rates in cisgender-females presenting to NZPC (5.0%) (Table 2).

PHF Science data

In the Auckland STI surveillance data for 2019 and 2020, chlamydia test positive rates for females were lower than females attending ASHS general clinics (6.3%) but were higher than cisgender-female sex workers (5.1%). In contrast to the ASHS testing data, most tests in the PHF Science data were requested in females (Table 2).

Gonorrhoea test results

NZPC cohort

The overall gonorrhoea test positive rate was 4.4%. Transgender-female sex workers had higher gonorrhoea test positive rates (12.7%) than cisgender-female sex workers (3.9%) (Table

3). Cisgender-female sex workers had lower test positive rates than females attending ASHS general clinics (5.0%). There were 32 participants who were diagnosed with gonorrhoea on at least one occasion during the study period: 25 were cisgender-female (78.1%), two were cisgender-male and five were transgender-female (15.6%). The ethnic breakdown was as follows: 12 were Māori (37.5%), 13 were European (40.6%), three were Pacific (9.4%), three were Asian (9.4%) and one identified as Other (3.1%). In cisgender-females, the site of infection was predominantly urogenital (22) followed by pharyngeal infection (13). Ten had dual site infections. All the transgender-females had either pharyngeal or anorectal infections. Of the two cisgender-males, one had urogenital infection and the other had both ano-rectal and pharyngeal infection.

ASHS general clinic attendees

The overall test positive rate for gonorrhoea was higher for ASHS general clinic attendees (6.0%) than for the NZPC cohort. Males had higher test positive rates (6.4%) than females attending ASHS general clinics (5.0%) (Table 2).

Table 3: Gonorrhoea test results.

NZPC: Aotearoa New Zealand Sex Workers' Collective (NZPC) clinic	Auckland Sexual Health Service (ASHS) general clinics 2019/2020*	Public Health and Forensic Science (PHF Science) sexually transmitted infection surveillance data 2019/2020
No. tests by gender N (%)	No. tests by sex N (%)	No. tests by sex N (%)
Cisgender-female 1,342 (93.9%) Cisgender-male 23 (1.6%) Transgender-female 55 (1.7%) Transgender-male 9 (0.62%) Total 1,429 (100%)	Female 7,307 (18.0%) Male 33,399 (80.0%) Total 40,706 (100%)	Female 251,637 (67.0%) Male 117,100 (33%) Total 368,737 (100%)
Test positive N (%)	Test positive N (%)	Test positive N (%)
Cisgender-female 53 (3.9%) Cisgender-male 3 (13.0%) Transgender-female 7 (12.7%) Transgender-male 0 (0.0%) Total 63 (4.4%)	Female 364 (5.0 %) Male 2,125 (6.4 %) Total 2,449 (6.0%)	Female 3,654 (1.5%) Male 6,783 (5.8%) Total 10,437 (2.8%)

*Quarter two ASHS lab data not available.

PHF Science data

Female gonorrhoea test positive rates (1.5%) in PHF Science data were lower than cisgender-female sex workers (3.9%) and also lower than females attending ASHS general clinics (5.0%). Male gonorrhoea test positive rates (5.8%) were similar to the test positive rates for male ASHS general clinic attendees (6.4%) (Table 3).

Serology results for NZPC cohort

HIV

During the study period there were 615 HIV tests requested for the NZPC clinic sample. All those who had serology for HIV also had syphilis serology requested on the same sample. All participants were tested at least once during the study period, apart from one person with previously diagnosed HIV who was on anti-retroviral treatment with an undetectable viral load. There were no new diagnoses of HIV during the study period in any of the participants.

Syphilis

Sixteen people (2.6%) had reactive syphilis serology test results, but after excluding those with previously treated syphilis only four participants had a new diagnosis (0.65% of tests). Of the four NZPC participants with new diagnoses of syphilis, three were cisgender-females and one was a cisgender-male.

HBV

HBV serological status was known for 253 (71%) of the 356 NZPC participants, either due to testing that was undertaken during the study period or from previous testing results. The majority of those who had been tested for HBV were either immune (48.2%) or had negative serology (36.0%). Three participants had serology results indicating chronic HBV infection; all were of Asian ethnicity.

HCV and documentation of drug use

There was no documentation in the notes regarding methamphetamine or injecting drug use in 189 participants (53.0%). One hundred and twenty-two responded no to use of methamphetamine or IDU (34.2%). Forty said yes to methamphetamine use (11.2%). Four were currently injecting drugs and one person had previously injected drugs.

One hundred and fifty-nine (44.4%) of the NZPC clinic participants were tested for HCV antibody (HCV Ab). The majority of those tested for HCV Ab were cisgender-females, (n=141; 88.6%), five were

cisgender-males (3.1%), 12 were transgender-females (7.5%) and one was a transgender-male. One hundred and thirty-four of those tested were negative for HCV Ab (84.2%) (Table 4). Twenty-five participants had HCV Ab detected (15.7%): 17 cisgender-females, seven transgender-females and one transgender-male (Table 4). Seven of the 25 people with reactive HCV Ab tests had HCV RNA detected, indicating current infection: five were cisgender-females and two were transgender-females (4.4% of those tested). Only four of the 25 people with reactive HCV Ab had a history of past treatment for HCV (16%). Only about two-thirds of those tested for HCV Ab (n=100; 63%) had documentation regarding whether they were taking illicit drugs or the indication for testing. Five of the people with reactive HCV Ab tests were documented as having a current or past history of injecting drugs (20%) and three of them had active infection with detectable HCV RNA. Of the 25 people with reactive HCV Ab, six had no documentation in the notes regarding illicit drug use, 13 were past or current users of methamphetamine, three had a current or previous history of injecting drugs and three denied any illicit drug use (Table 4).

Discussion

This study addresses an important gap in the literature, as there has previously been very little published data available on STBBI diagnoses in sex workers in New Zealand apart from some limited enhanced surveillance data for gonorrhoea and syphilis.⁵

It was interesting to note that test positive rates of chlamydia were lower in cisgender-female NZPC participants (5.1%) than in females in the PHF Science data (6.3%) and lower than females attending ASHS general clinics (9.0%). Gonorrhoea rates in cisgender-females in the NZPC cohort, however, were higher (3.9%) than female test positive rates in the PHF Science data (1.5%) but were lower than female rates in ASHS general clinic attendees (5.0%). The finding of higher test positive rates for chlamydia and gonorrhoea in females attending ASHS general clinics in comparison to the PHF Science data was not unexpected, as following a review of the service in 2015 primary access to ASHS clinics was restricted to priority (key) populations with known inequities in STBBIs. These populations were identified from STI surveillance data and include people under the age of 30, people of

Table 4: Hepatitis C results and documentation of drug use.

Tested for HCV antibody (HCV Ab) N=159 (44.4%)	Documentation of drug use in those tested for HCV Ab
Gender	HCV Ab negative N=134 (84.3%)
Female 141 (88.6%) Male 5 (3.1%) Transgender-female 12 (7.5%) Transgender-male 1 (6.2%)	Not documented 55 (41.0%) Meth use yes 21 (15.7%) Meth use no 57 (42.5%) Current or past injecting drug use (IDU) 2 (1.5%)
HCV Ab positive N=25 (15.7%)	HCV Ab positive N=25 (15.7%)
Female 17 (68.0%) Male 0 (0%) Transgender-female 7 (28.0%) Transgender-male 1 (4.0%)	Not documented 6 (24%) Meth use yes 13 (52%) Meth use no 3 (12.0%) Current or past IDU 3 (12.0%)
HCV RNA detected N=7 (4.4%)	HCV RNA detected N=7 (4.4%)
Female 5 Male 0 Transgender-female 2 Transgender-male 0	Not documented 1 Meth use yes 4 Meth use no 1 Current or past IDU 1

Māori and Pacific ethnicity, GBMSM, people living with HIV, transgender people, sex workers and people who inject drugs.⁶

It is not known why gonorrhoea rates were higher in NZPC participants than rates in PHF Science data when chlamydia rates were lower, but this may be due to differing risk factors within the cohort for acquisition of gonorrhoea. There were 32 NZPC participants who were diagnosed with gonorrhoea on at least one occasion during the study period. Their median age (30) was similar to the whole NZPC sample but there were ethnic and gender differences. The majority of those diagnosed with gonorrhoea were of non-white ethnicity (n=19; 59.3%), and there was a much higher proportion of Māori diagnosed (n=12; 37.5%). Similar to chlamydia, the gonorrhoea rate was higher in transgender-females (n=5; 22.7%). Three of the transgender-females were of Māori ethnicity, one was Pacific and the

other was European. It has been a consistent finding in STI surveillance data that Māori have disproportionately higher rates of gonorrhoea compared with other ethnicities. In the 2020 PHF Science annual report, 85 out of 3,738 notified gonorrhoea cases were diagnosed in sex workers (2.3%).⁵ The majority were female sex workers (n=64; 75.2%) and 29 were of Māori ethnicity (34%).⁵ The proportion of cases reported to be of Māori ethnicity had increased across all sexual behaviours compared with 2019. Further, a recent study of bacterial STI in New Zealand found higher rates of gonorrhoea infection and reinfection in people of Māori and Pacific ethnicity.⁷

Apart from ethnicity, other factors to consider are that street-based or migrant sex workers may be more vulnerable to acquisition of gonorrhoea. A previous study of STI diagnoses at the NZPC clinic in 2012 (personal written communication from Sygrove C, Auckland Regional Sexual Health

Service on 2024 Mar 20), found low prevalence rates of chlamydia and gonorrhoea in sex workers attending the NZPC clinic (4.8% and 1% respectively) but higher rates in self-taken samples from street-based sex workers that did not attend the NZPC clinic (10% and 2% respectively). A study conducted in female sex workers (FSW) in Sydney from 2005 to 2019 found increasing prevalence rates of chlamydia and gonorrhoea over time and an increase in rates of pharyngeal gonorrhoea.⁸ Pharyngeal infection rates were higher for FSW born in China, and the authors considered this may be due to reduced condom use for oral sex. A high proportion of the cisgender-females in the NZPC sample who were diagnosed with gonorrhoea had pharyngeal infection, and this may be due to similar factors to the Australian study.

There were no new HIV diagnoses in the largely cisgender-female NZPC sample during the study period, and this is consistent with the epidemiology of HIV in New Zealand in that locally acquired infections are most often diagnosed in GBMSM.⁹ Case detection of syphilis was low in sex workers. Similar to HIV, syphilis is more commonly diagnosed in GBMSM, who made up 62.9% of cases reported to PHF Science in 2019 and 56.4% of cases in 2020, although the proportion of cases diagnosed in women who have sex with men did increase from 2019 to 2020 (12.6% and 17.6% respectively).⁵

A large proportion of the NZPC sample were tested for HCV during the study period (44.4%), but only just over half of participants had documentation in their notes regarding illicit drug use or other indications for testing. At the time of the study there was a pilot intervention in place to try to increase HCV diagnosis and access to treatment in the clinic, so more opportunistic testing was being carried out, regardless of whether risk factors were disclosed or not. There is a known intersection with sex working and illicit drug use, so it is likely drug use was under-documented. In a Christchurch study, street-based sex workers more frequently reported using money from sex work for drugs and using drugs at work when compared with indoor workers. They also reported higher levels of violence than indoor workers.¹⁰ There was also a significant difference between the proportion of street workers (76%) and indoor workers (33%) who said they used drugs at work.

These studies highlight the importance of risk assessment and opportunistic testing for HCV in sex workers, particularly in more vulnerable

street workers. It is estimated that up to 40% of people living with HCV in New Zealand are unaware, and almost all new infections are diagnosed in people who inject drugs.¹¹ The funding of direct anti-viral treatment for HCV has provided an opportunity to potentially eliminate this infection in New Zealand if enough testing is done in key populations; however, linkage to care remains challenging. A large overseas study of over 11,000 people tested in an STI clinic setting found significantly lower test positive rates for HCV Ab than this study (1.6%) but only 16.5% of the 121 (1.1%) of HCV Ab positive people with detectable HCV RNA completed treatment.¹²

Finally, stigma associated with sex work is still real despite decriminalisation. In their literature review, Jordon commented: “Historically sex workers have often been reviled for being disease carriers and held responsible for the transmissions of venereal diseases. Such thinking gave rise to the Contagious Diseases Act in both New Zealand and the United Kingdom. More recently it has been linked to perceptions of sex workers as a high at-risk group for the transmission of HIV/AIDS.”⁴ It is hoped that these data may help to dispel some of those myths.

Limitations of this study include the time period when it was conducted, which overlapped with the first year of the COVID-19 pandemic, and the 5-year period that has elapsed since the data were collected. Other limitations are that the laboratory datasets did not include gender or ethnicity demographics and would have included some data from sex workers attending general clinics for testing; however, this is unlikely to impact significantly on interpretation of the results due to the large numbers of tests. It is not known how representative this sample is of sex workers in Auckland or the rest of New Zealand as there are no reliable data. A strength of the study is that this was a relatively large sample of sex workers, and that testing data were able to be compared with that of general sexual health clinic attendees and PHF Science population-based data. While these data may not reflect current epidemiology, they do represent a snapshot in time that could be used to compare with any future research.

Conclusions

Cisgender-female sex workers had lower rates of diagnoses of chlamydia and gonorrhoea than females attending general sexual health clinics. STBBI testing in sex workers should routinely include assessment and testing for HCV to enable

linkage to care and assistance with harm reduction. Further research in this area should be encouraged; in particular more data are needed

in male sex workers. Sex workers should continue to be considered a priority population for STBBI-related policies and guidelines.

COMPETING INTERESTS

Nil.

ACKNOWLEDGMENTS

The author would like to acknowledge and thank Dame Catherine Healy and Annah Pickering who provided oversight of the research and gave advice and guidance in the preparation of this manuscript.

CORRESPONDING AUTHOR INFORMATION

Dr Sunita Azariah: Sexual Health Physician, Auckland Sexual Health Regional Service, Health New Zealand – Te Whatu Ora Te Toka Tumai Auckland, New Zealand.
E: sunitaa@adhb.govt.nz

URL

<https://nzmj.org.nz/journal/vol-139-no-1631/diagnoses-of-blood-borne-viruses-and-other-sexually-transmitted-infections-stbbi-in-a-sample-of-356-sex-workers-attending-a-sexu>

CITATION

Azariah S. Diagnoses of blood-borne viruses and other sexually transmitted infections in a sample of 356 sex workers attending a sexual health outreach clinic in Auckland over a two-year period. *N Z Med J.* 2026 Mar 13;139(1631):28-37. doi: 10.26635/6965.7213.

REFERENCES

1. Ministry of Health – Manatū Hauora. Aotearoa New Zealand Sexually Transmitted and Blood Borne Infection Strategy 2023-2030 [Internet]. Wellington, New Zealand: Ministry of Health – Manatū Hauora; 2023 Mar 12 [cited 2025 Jul 31]. Available from: <https://www.health.govt.nz/publications/aotearoa-new-zealand-sexually-transmitted-and-blood-borne-infection-strategy-2023-2030>.
2. Elmes J, Stuart R, Grenfell P, et al. Effect of police enforcement and extreme social inequalities on violence and mental health among women who sell sex: findings from a cohort study in London, UK. *Sex Transm Infect.* 2022 Aug;98(5):323-331. doi: 10.1136/sextrans-2021-055088.
3. University of Otago. The Impact of the Prostitution Law Reform Act on the Health and Safety Practices of Sex Workers - Report to the Prostitution Law Review Committee [Internet]. Christchurch, New Zealand: University of Otago; 2007 Nov [cited 2025 Jul 31]. Available from: <https://www.otago.ac.nz/christchurch/otago018607.pdf>.
4. Jordan J. The sex industry in New Zealand: A literature review [Internet]. NZPC: Aotearoa New Zealand Sex Workers' Collective; March 2005 [cited 2025 Jul 31]. Available from: <https://www.nzpc.org.nz/Research>.
5. The Institute of Environmental Science and Research Ltd. Sexually Transmitted Infections in New Zealand: Supplementary Annual Surveillance Report 2020 [Internet]. Porirua, New Zealand: The Institute of Environmental Science and Research Ltd; 2022 May [cited 2025 Nov 24]. Available from: https://www.phfscience.nz/media/aqyfmzqi/final_sti_supplementaryreport_2020-3.pdf.
6. Azariah S. Time for another review: following implementation of a new service model for Auckland Sexual Health service there has been an increase in referrals, case complexity and clinical workload but regional inequities in access remain. *N Z Med J.* 2022 Jan 20;136(1568):56-64. doi: 10.26635/6965.5919.
7. Kumbaroff Z, Duff P, Saxton P, et al. Sexually Transmitted Infections and the Risk of Reinfection Within 12 Months: A Population-Based Cohort. *Sex Transm Dis.* 2023 Dec 1;50(12):775-781. doi: 10.1097/OLQ.0000000000001874.
8. Cotter J, McManus H, Vickers T, et al. Increasing prevalence of gonorrhoea and chlamydia among female sex workers in northern Sydney, 2005-2019. *Int J STD AIDS.* 2023 Oct;34(12):869-875. doi: 10.1177/09564624231173024.
9. Saxton PJW, McAllister SM, Thirkell CE, et al. Population rates of HIV, gonorrhoea and syphilis diagnoses by sexual orientation in New Zealand. *Sex Transm Infect.* 2022 Aug;98(5):376-379. doi: 10.1136/sextrans-2021-055186.
10. Plumridge L, Abel G. A 'segmented' sex industry in New Zealand: sexual and personal safety of female sex workers. *Aust N Z J Public Health.* 2001;25(1):78-83. doi: 10.1111/j.1467-842x.2001.tb00555.x.
11. Ministry of Health – Manatū Hauora. National Hepatitis C Action Plan for Aotearoa New Zealand – Māhere Mahi mō te Ate Kakā C 2020-2030 [Internet]. Wellington, New Zealand: Ministry of Health – Manatū Hauora; 2021 Jul 28 [cited 2025 Nov 24]. Available from: <https://www.health.govt.nz/publications/national-hepatitis-c-action-plan-for-aotearoa-new-zealand>.
12. Dileepan A, Alderton L, Obafemi O, et al. The Missing Link: Hepatitis C Linkage to Care Through a Public Sexual Health Clinic. *Sex Transm Dis.* 2025 Oct 1;52(10):e68-e70. doi: 10.1097/OLQ.0000000000002114.