Inequity in prevention of sexually transmitted infections: An analysis of online survey responses

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Abstract

Background

Sexually transmitted infections (STIs) are an ongoing public health concern globally. In Aotearoa New Zealand, inequities have been reported in STI exposure; for example, the rate of chlamydia for Māori and Pacific Peoples is 3.7 and 4.0 times higher, respectively, than for those of European descent. Despite inequities in STI exposure, little is known about STI prevention (i.e., access to sexual healthcare, knowledge, and condoms), and how it may vary between demographic groups. Sexual Wellbeing Aotearoa (formerly Family Planning New Zealand) is the largest primary care provider of Sexual and Reproductive health in Aotearoa and undertook a survey to investigate experiences and understanding of STI prevention.

Methods

A retrospective analysis of Sexual Wellbeing Aotearoa survey data collected from June 2023. Ethical approval was obtained from University of Otago. Survey items query access to STI prevention (testing, knowledge, healthcare, and condoms). Analysis structure included a descriptive summary of (a) respondent demographic characteristics, and (b) survey item responses. Logistic regression was applied to compare survey item responses between demographic groups (adjusted for age and gender).

Results

A total of 969 respondents met inclusion criteria. Overall, descriptive statistics indicate some gaps in access to STI prevention. Particular group inequities were also found. Condom access for Māori (OR = 0.34, 95% CI = 0.17, 0.69) and Pacific Peoples (OR = 0.24, 95% CI = 0.10, 0.70) is worse than for non-Māori/non-Pacific peoples. Cost was the main reported barrier to condom access. People under 30 are

less likely to report having enough understanding about STIs to avoid getting or giving one (OR = 0.42, 95% CI = 0.32, 0.56) and when to test for STIs (OR = 0.43, 95% CI = 0.32, 0.56).

Conclusions

In Aotearoa not everybody has equal access to the tools needed to prevent STIs. The inequities in STI prevention appear to align with inequities in STI exposure in young people, Māori and Pacific Peoples. It is vital that STI prevention efforts understand the drivers of inequity and include young people, Māori and Pacific People groups to design solutions to address these inequities.

Introduction

Sexually transmitted infections (STIs) are among the most common communicable diseases and present a persistent challenge for countries around the world. The World Health Organization (1) estimates that one million STIs are acquired each day and many of these infections are asymptomatic and can have lifelong consequences (WHO 2023). Despite the ubiquity of STIs, they are highly stigmatized which creates additional barriers for testing, treatment, and partner notification. Access to sexual health information, high-quality services, and confidential treatment is essential for preventing STIs.

The incidence of STIs in Aotearoa New Zealand (NZ) remains persistently high by international standards (2). Syphilis, gonorrhoea and HIV/AIDS are the only notifiable STIs in NZ (3). Certain groups in NZ are disproportionately affected by STIs, including young people (aged 15-29), those living in urban areas, men who have sex with men, and Māori and Pacific Peoples (4). The inequities are especially stark for Māori and Pacific Peoples. For example, the rate of chlamydia for Māori and Pacific Peoples is 3.7 and 4.0 times higher, respectively, than for those of European descent; the rate of gonorrhoea is 3.3 times higher for Māori and 5.5 times higher for Pacific Peoples than those of European descent. The majority of these infections are among young people aged 15-29. These persistent disparities are likely the result of complex, intergenerational social and structural inequities spurred by European colonisation (5, 6).

Prevention of STIs starts with evidence-based education of symptoms, health outcomes and the importance of testing. Testing is an effective strategy to mitigate both the short and long-term health consequences as well as stem the spread of

infections. Recent research from NZ indicates that close to half of people who experience symptoms delayed seven or more days before contacting health services about an STI and one-third continue to be sexually active after becoming symptomatic, thus potentially spreading their infection (7). STI reinfection disproportionately affects younger people (aged 15-24) as well as Māori and Pacific peoples (8). Despite NZ's robust guidelines for STI testing (9), many people are not tested when needed and continue to face a range of barriers to prompt testing and treatment.

Recent research with young Māori and Pacific Peoples offered several ways to lower barriers to STI testing, including the need for free, flexible services for STI testing, education and health promotion across generations, culturally appropriate messages, and community-based channels which reach young people in their spaces (10). The convenience and confidentiality of self-testing for STIs has made it an acceptable and even preferable option for many (11). Online STI self-testing has recently been made available in NZ but the distributer requires the user to provide payment (approximately $85) making it cost-prohibitive for many people. It important to note that when surveyed about self-testing for STIs, young Māori and Pacific Peoples had no awareness of the option and expressed concerns about cost and process; these findings highlight the need for free treatment and access to a clinician for support (12).

As high STI rates persist in NZ, there are evident and urgent needs: improved access to sexual health education and information, free or low-cost STI testing, efficient and high-quality service provision, and the need to address the persistent challenge of inequitable distribution of infections. One such way would be to ensure

that improved access for testing, information and services are designed in partnership with young Māori and Pacific Peoples. Against this background, we present analysis of responses to an online STI survey conducted by Sexual Wellbeing Aotearoa. From the online survey, we focus on six main items which relate to STI prevention. These items query access and experience with testing, self-efficacy and access to prevention, education, and knowledge around prevention and treatment. The main aims of this analysis are to:

1. Describe self-reported access to tools of STI prevention; and
2. Test for differences in access to STI prevention between demographic groups.

Method

Ethics

This study was approved by University of Otago Ethics Committee, reference number HD24/009.

Positionality statement

Dr. Tania Huria and Dr. Nathan Monk have extensive experience on many Kaupapa Māori research projects. Dr. Beth Messenger and Ragnar Anderson have significant experience conducting research in sexual and reproductive health.

Participants

Participants responded to an online survey, distributed through social media by Sexual Wellbeing Aotearoa. A total of 1,030 people responded to the survey. People were excluded who: did not give consent for their data to be used (n = 7), completed

the survey in <1 minute (*n* = 40), reported their geographic region as overseas (*n* = 13), or answered only demographic items (*n* = 1). Responses from the remaining 969 people were analysed.

Measures

Demographic measures. Participants were asked about their age, ethnicity (could have multiple ethnicities), geographic region, whether they live in an urban or rural area, and gender. For statistical analyses, age was dichotomised as <30 years and 30+ years; ethnicity was categorised into Māori, Pacific Peoples, and non-Māori non-Pacific; and gender was categorised into female, male, and gender diverse (which includes all genders not given as male or female).

Sexual health items. Comprised main items for all respondents, and follow-up items contingent on responses to main items. The six main items:

1. Have you had an STI test in the past 5 years (including during pregnancy or when you've had a cervical screen)?
2. Has a health practitioner (nurse, doctor, GP) ever talked to you about getting an STI test when you didn't have any symptoms or didn't bring it up yourself?
3. Could you get condoms if you needed them?
4. Were STIs a topic covered in relationships and sexuality education at school, in alternative education or in home schooling?
5. Do you feel you understand enough about STIs to help you avoid getting an STI or giving one to someone else?
6. Do you feel you understand enough about STIs symptoms to know when you should get a test?

Items 1–4 were measured with a binary yes/no response. Items 5–6 were assessed on a 0–100 scale. Responses for both items skewed toward 100. Item 5 had a median response of 90 (IQR = 72–100). Item 6 had a median response of 77 (IQR = 52–99). Items 5 and 6 were dichotomised with <80 indicating lower understanding and 80+ indicating good understanding. Raw scale responses to items 5 and 6 correlated r =.68.

Follow-up sexual health items were designed to parse more information about how respondents are engaging with the health system regarding their sexual health. For example, following main item 1, participants who responded “yes” were subsequently asked if it was difficult to get an STI test (see supplementary table S1 for full list of items).

Last, respondents were asked to rate the importance of nine ideas to reduce STIs in NZ as *Least important*, *Somewhat important*, or *Most important*.

Analysis

All survey responses were analysed descriptively to present the sample demographic characteristics, response frequencies for sexual health items, and perceived importance of ideas to reduce STIs in NZ.

Logistic regression models were estimated on the six main survey items to compare responses between demographic groups. The following demographic comparisons were made on each main item: Māori vs. non-Māori non-Pacific; Pacific vs. non-Māori non-Pacific; gender diverse vs. female; male vs. female; age <30 years vs. age 30+ years; urban vs. rural. Models were adjusted for age and gender (when each were not the independent variable being modelled). Missing responses were handled with pairwise deletion.

Results

All data cleaning and statistical analyses were performed in R (R 4.1, R Institute, Vienna, Austria).

Demographics

Responses from 969 participants were analysed. Demographic characteristics of the study sample are reported in Table 1. Overall, the sample has good coverage of age and geographic location. Ethnicity is also reasonably representative of the NZ population, except Asian and Pacific Peoples were slightly under-represented. The most notable demographic bias is in gender: 84.2% of respondents are female.

Table 1. (would be inserted here)

Sexual heath response frequencies

On sexual health items, there was substantial response attrition throughout the survey: main item 1 had zero missing responses; main item 4 (the last assessed in the survey) had 100 missing responses. Chi-square null hypothesis tests for attrition bias indicated that the group of respondents who did not complete the last main item (n = 100), did not differ from respondents who completed the last main item (n = 869) in terms of gender composition (χ^2[2, N = 969] = 0.28, p = .87) or the proportion aged <30 and 30+ years (χ^2[1, N = 969] <0.001, p = 1). Response frequencies for main items 1–4 and associated follow-up items are described below (see supplementary Table S1 for all response frequencies). Items 5 and 6 are not reported here as they had no follow-up items (see Method section for raw response descriptives for main items 5 and 6).

Item 1. 622 respondents (64.2%) reported having an STI test in past 5 years; 347 respondents (35.8%) reported not having an STI test in the past 5 years. Of the 622 respondents who reported having an STI test in the past 5 years, 112 (18.0%) reported that it was difficult to get the test. Figure 1 shows the frequencies for reported difficulties in getting an STI test. Of the 347 people who reported no STI test in the past 5 years, the most common reasons for not getting tested were: no unprotected sex (57.1%), and no perceived risk (30.5%). (See Figure 1)

Figure 1. (would be inserted here)

Item 2. 348 respondents (35.9%) said a health practitioner had ever talked to them about getting an STI test when the respondent did not have symptoms and did not raise the topic; 585 respondents (60.4%) reported this had not happened. The health practitioners most frequently raising this topic were: general practitioner (51.7%), nurse at general practitioner (40.5%), and practitioner at sexual health clinic (32.2%).

Item 3. 871 respondents (89.9%) reported being able to access to condoms if needed; 40 respondents (4.1%) reported not being able to access condoms. The most commonly reported sources for condoms were: supermarket (49.0%), doctor/GP (21.5%), and Sexual Wellbeing Aotearoa (20.1%). Of the 871 respondents with access to condoms, 193 (22.2%) report not using/getting them. Of the 40 respondents with no access to condoms, the main reported barrier was cost (60.0%). The most commonly reported factors which might stop a respondent using condoms with a new or casual partner were: other effective contraception being used (27.6%), partner refusing (22.0%), not liking using them (17.5%), an drugs/alcohol making respondent less likely to use them (16.0%).

Item 4. 581 respondents (60.0%) reported that STIs were a topic covered in relationships and sexuality education in school; 288 respondents (29.7%) reported

not learning about STIs, or that their school did not offer relationships and sexuality education. Respondents reported learning about STIs from a variety of sources, in particular: online (43.0%), school sexual education (36.7%), and from a doctor/nurse (35.9%).

Demographic group comparisons on main items

Demographic group comparisons from crude and adjusted logistic regression models are presented in Table 2.

Ethnic differences in condom access. Māori (Adjusted OR = 0.34, 95% CI = 0.17, 0.69) and Pacific (Adjusted OR = 0.24, 95% CI = 0.10, 0.70) respondents were significantly less likely than non-Māori non-Pacific respondents to report having access to condoms.

Gender differences in STI query from practitioner. People who identified as gender diverse (Adjusted OR = 0.49, 95% CI = 0.26, 0.88) or male (Adjusted OR = 0.53, 95% CI = 0.32, 0.86) were significantly less likely than females to report being asked about STI testing by a health practitioner without having symptoms or raising the topic themselves.

Age differences in STI testing and understanding. People aged under 30 years were more likely to report receiving an STI test in the past 5 years (Adjusted OR = 1.54, 95% CI = 1.17, 2.03), and less likely to report having enough understanding to avoid getting and transmitting STIs (Adjusted OR = 0.42, 95% CI = 0.32, 0.56) and when to get an STI test (Adjusted OR = 0.43, 95% CI = 0.32, 0.56) than people aged 30 years or older.

Urban vs. rural difference in understanding. People living rurally were more likely to report understanding when to get an STI test than people living in urban areas (Adjusted OR = 1.63, 95% CI = 1.05, 2.56).

Table 2. (would be inserted here)

Responses to ideas to reduce sexually transmitted infections in New Zealand

All response frequencies for ideas to reduce STIs in NZ are presented in supplementary Table 2. Overall, respondents considered all ideas to be important. In particular, the most favoured ideas to reduce STIs in NZ were (% *Most important*): Free STI testing and consultation in primary care (76.4%), Share information in schools and community about STIs and tests (71.1%), Normalise talking about STIs (70.0%), Share information in schools and community to explain STI testing isn't scary (67.2%), More providers offering self-testing in clinic (67.0%).

Discussion

This research presents an analysis of responses (*N* = 969) to a survey investigating understanding of sexually transmitted infection (STI) prevention within the context of NZ. The findings of this study reveal disparities in accessing essential tools for STI prevention, indicating underlying inequities particularly for Māori and Pacific Peoples. Employing descriptive analysis, the survey responses were analysed to delineate demographic characteristics, frequency distributions concerning sexual health items, and the perceived significance of strategies aimed at curbing STIs in NZ. Logistic regression models were applied to responses across demographic segments, with results supporting previous research findings. Notably, condom accessibility was overall quite high, as 9 in every 10 respondents reported they could access condoms if needed. However, Māori and Pacific respondents were more likely to report being unable to access condoms, indicating a pressing need for a population health

approach to STI prevention, particularly concerning improving access to condoms among Māori and Pacific Peoples.

The findings of this study align with the recommendations outlined in the United Nations Population Fund's recent report on sexual and reproductive health which emphasises the importance of equitable access to comprehensive sexual and reproductive health services (13). The results of this survey indicate that there are gaps in access to the tools of STI prevention. Moreover, we present evidence that these gaps are not distributed evenly across society. These ethnicity-, age-, and geography-based inequities in STI prevention likely contribute to observed inequities in STI rates (4). In their 2020 review of sixteen studies on STIs in NZ, Smith and Wilby concluded that free testing and treatment was critical to improve outcomes (14). Our results echo this message, as the cost and other structural challenges that prevent people from seeking STI tests. As Rose and colleagues highlighted (10), it is critical that efforts to improve access to prevention, testing and treatment are designed specifically to be relevant and resonant for young people, particularly Māori and Pacific Peoples, given the disparities in STI rates among these groups (4).

Several researchers have pointed to the need to bring STI testing services out of clinics and into spaces where those most often affected would feel more comfortable (10,15), including free or low-cost self-test STI kits (12). Furthermore, this study highlights the critical role of relationships and sexual health education in STI prevention. The ability to access testing and treatment is predicated on knowledge of STIs, including prevention, symptoms, where to seek testing and treatment, an understanding of transmission, and short and long-term health risks. Education and information around STIs remain a critical avenue for progress; given that one-third of the respondents reported that they did not receive education on STIs in school, it is

unsurprising that there were large numbers of young people (those under 30 years old) who lacked understanding of how to prevent an STI and when to seek testing. In a recent survey young people identified the need to reduce stigma and normalise sexual health services (16). Similarly, 70% of respondents to the present survey rated the need to normalise talking about STIs as *Most important*. Other studies highlighted the importance of providing sexuality education to young people when they became sexually active, not just beforehand (7) and how robust sex education can increase STI testing practices (17). In NZ, relationships and sexuality education (RSE) is provided by schools but attendance is not compulsory; it also only goes to Year 10, at which time students are typically 14-15 years old and often not yet sexually active. Clark and colleagues found that only 9.6% of Year 10 students had ever had sex and only 4.7% were currently sexually active (18). This underscores the need for comprehensive and culturally sensitive sexual health curriculum that address the needs of diverse populations. This could be addressed by extending the years in which sexuality education is required in school to include those in Years 11, 12 and 13; it is currently only compulsory for schools to offer it up to Year 10 (19). By providing accurate information and promoting positive attitudes towards sexual health, relationship and sexual health education can empower individuals to make informed decisions and normalise conversations to adopt STI preventative behaviours.

Moreover, the research identifies concerning trends regarding STI testing rates, with over a third of respondents indicating a lack of STI testing within the past five years. Particularly alarming is the decreased likelihood of STI testing among individuals aged 30 years and older, with a notable dearth in discussions initiated by healthcare practitioners on STI testing, especially among gender-diverse individuals. Barriers to

testing cited by respondents include prolonged wait times, inconvenient clinic hours, apprehension of judgment from healthcare providers, difficulty in obtaining time off from work or school, and financial constraints. These barriers may contribute to delayed health seeking behaviours and ultimately exacerbate STI transmission and reinfection rates. This highlights the need for opportunistic free or low-cost testing options, flexible availability of self-testing options, comprehensive treatment pathways that are free or low-cost, appropriate messaging, and community outreach initiatives.

This research indicates that STI prevention requires a multifaceted, multi-systems approach that spans across health and education. Policy makers in both areas need to be cognisant of the findings of this research, alongside current STI statistics that are concerning for young Māori and Pacific Peoples (4), Further research is required to understand the impact of STIs on fertility and reproductive justice. Relationship and sexual health education is one of the tools to understanding STI prevention, and this needs to be considered in greater depth by policymakers before any proposed curriculum changes are enacted. Likewise, health systems, particularly within primary health care, need to consider best practice pathways for regular STI testing and making self-testing and treatment accessible and affordable.

Strengths and limitations

The self-report survey design means that demographic variables such as gender, ethnicity, and age represent the identities of respondents (20). This is relative strength compared to health studies using administrative NZ health data, which has been estimated to undercount Māori by 16% (21). The self-report design of the

present study mitigates this, as well as mitigating undercounts of other minority identities (e.g. gender diverse people).

There were some notable limitations of this analysis. Participants were self-selected, and likely to have some engagement with Sexual Wellbeing Aotearoa (e.g. follow Sexual Wellbeing Aotearoa on social media). This selection bias was particularly evidenced by 84.2% of the sample identifying as female. Future research is needed to investigate access to STI prevention among the general population. It appears plausible that gaps in STI prevention will be larger than reported here, as participants in this study may have above-average STI literacy due to being in contact with Sexual Wellbeing Aotearoa. With an overall sample size of 969, some comparisons groups were quite small, and analyses were possibly underpowered to detect true effects. For instance, there were only 56 people who identified as Pacific Peoples, so confidence intervals tended to be fairly wide when modelling outcomes for the Pacific Peoples group. Future research with larger representative samples will help generate more precise and generalisable estimates. Last, there was substantial respondent attrition over the survey; the last main item assessed (item 4) had 100 missing responses. Checks for attrition bias did not reveal significant differences in age or gender. However, it is plausible that attrition may have biased responses to later items in some way beyond age and gender.

Conclusions

This survey demonstrates that not everybody in Aotearoa has equal access to the tools needed to prevent STIs. The inequities in STI prevention appear to align with inequities in STI exposure in young people, Māori and Pacific Peoples. These findings require replication in larger, generalisable NZ samples. It is vital that STI

prevention efforts understand the drivers of inequity and include young people, Māori and Pacific groups to design solutions to address these inequities.

The inequities demonstrated in this survey echo the current international discourse around STIs. UNFPA is raising the alarm around the ways in which sexual and reproductive health and rights are compromised, noting that those rights are “more frequently, and more severely undermined among those facing one or more forms of oppression, such as those enduring ethnic or racial discrimination, persecution over HIV status or disability, or discrimination over their sexuality or gender identity,” (13, p.39).

The rise of STIs, particularly for those who face multiple and intersecting forms of discrimination, highlights the failure to protect and uphold basic human rights. Regardless of age, gender, ethnicity or sexuality, people need education and information about to how to prevent, test and screen for STIs; such knowledge must be accompanied by easily accessible, culturally responsive, and nimble health services. Without attention to these dimensions of prevention, STI rates will only continue to rise, further reinforcing existing inequities.

The authors declare no conflict of interests.

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Data Availability Statement (DAS): The data that support this study will be shared upon reasonable request to the corresponding author. Please contact Ragnar Anderson at ragnar.anderson@sexualwellbeing.org.nz for inquiries.

Table 1. Demographic characteristics of study sample (*N* = 969)

Demographic variable		Frequency	
Age		*n*	%
	16-19	76	7.8
	20-24	142	14.7
	25-29	168	17.3
	30-34	194	20.0
	35-39	123	12.7
	40+	265	27.3
	Unknown	1	0.1
Gender			
	Female	816	84.2
	Male	92	9.5
	Gender diverse	60	6.2
	Unknown	1	0.1
Region			
	Auckland	262	27.0
	Canterbury and West Coast	143	14.8
	Gisborne and Hawkes Bay	31	3.2
	Manawatu, Whanganui, Taranaki and Wairarapa	67	6.9
	Nelson, Marlborough and Tasman	16	1.7
	Northland	30	3.1
	Otago and Southland	86	8.9
	Waikato and Bay of Plenty	123	12.7
	Wellington	211	21.8
Lives in rural or urban area			
	Rural	99	10.2
	Urban	869	89.7
	Unknown	1	0.1
Ethnicity			
	Māori	169	17.4
	Pacific Peoples	56	5.8
	European	822	84.8
	Asian	69	7.1
	MELAA[a]	11	1.1
	Other/Unknown	13	1.3

Note: [a]Middle Eastern, Latin American and African.

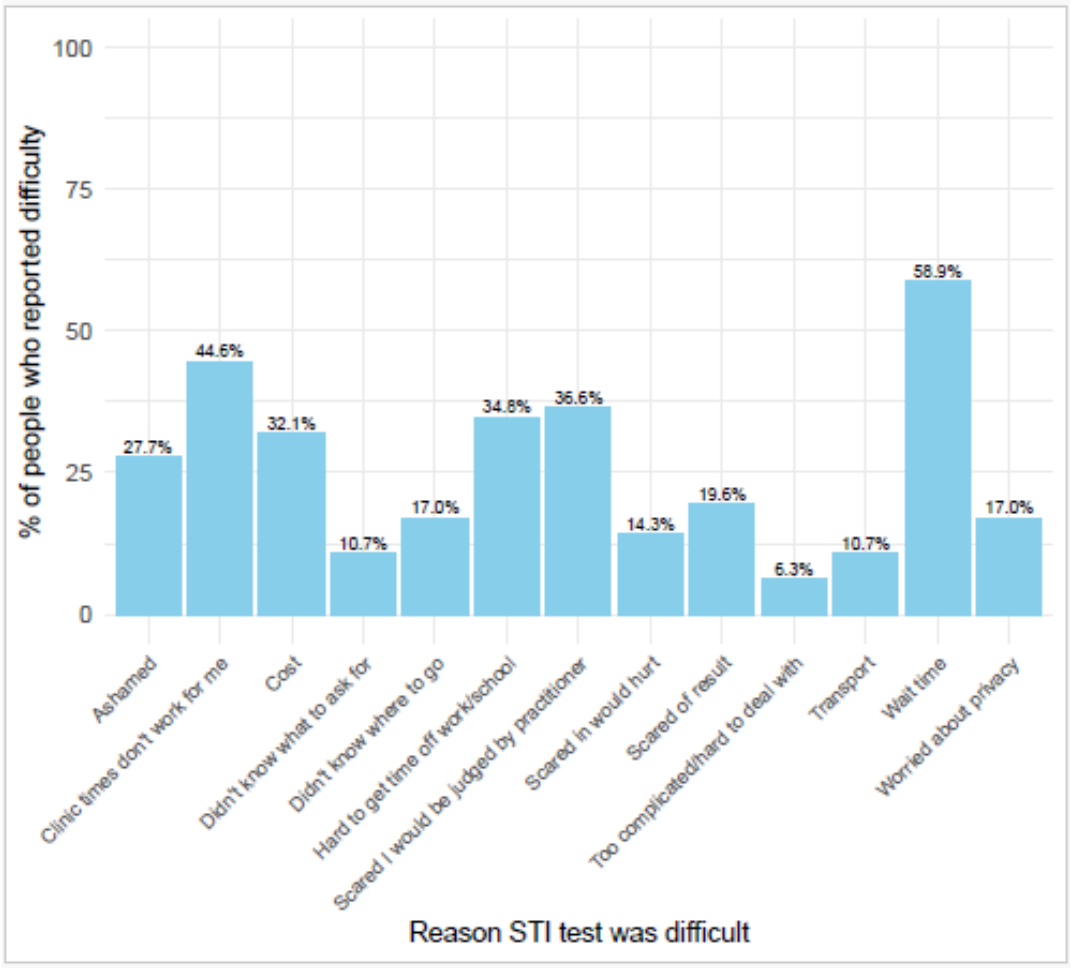
100
75
50
25
0
% of people who reported difficulty
27.7%
44.6%
32.1%
10.7%
17.0%
34.8%
36.6%
14.3%
19.6%
6.3%
10.7%
58.9%
17.0%
Ashamed
Clinic times don't work for me
Cost
Didn't know what to ask for
Didn't know where to go
Hard to get time off work/school
Scared I would be judged by practitioner
Scared in would hurt
Scared of result
Too complicated/hard to deal with
Transport
Wait time
Worried about privacy
Reason STI test was difficult

Figure 1.

Table 2. Crude and adjusted demographic group comparisons of main survey item responses

	Māori[a]		Pacific[a]		Gender diverse[b]		Male[b]		Age (<30 years)[c]		Rural[d]	
	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)	Crude OR (95% CI)	Adjusted OR (95% CI)
1. Past 5 years STI test	1.28 (0.90, 1.84)	1.22 (0.85, 1.76)	0.70 (0.41, 1.22)	0.64 (0.37, 1.11)	1.54 (0.87, 2.86)	1.33 (0.75, 2.49)	0.80 (0.51, 1.24)	0.78 (0.50, 1.22)	*1.56 (1.19, 2.06)	*1.54 (1.17, 2.03)	0.70 (0.46, 1.07)	0.73 (0.48, 1.12)
2. Health practitioner asked	1.13 (0.80, 1.60)	1.12 (0.79, 1.59)	0.66 (0.35, 1.19)	0.63 (0.33, 1.15)	*0.52 (0.28, 0.94)	*0.49 (0.26, 0.88)	*0.54 (0.32, 0.87)	*0.53 (0.32, 0.86)	1.16 (0.89, 1.53)	1.21 (0.92, 1.59)	0.88 (0.56, 1.37)	0.91 (0.58, 1.42)
3. Condom access	*0.32 (0.16, 0.66)	*0.34 (0.17, 0.69)	*0.25 (0.10, 0.70)	*0.24 (0.10, 0.70)	0.81 (0.28, 3.43)	0.94 (0.32, 4.05)	0.92 (0.35, 3.14)	0.93 (0.36, 3.17)	0.53 (0.28, 1.00)	0.53 (0.28, 1.01)	0.52 (0.23, 1.31)	0.49 (0.22, 1.24)
4. STI education in school	0.87 (0.61, 1.27)	0.85 (0.59, 1.24)	0.83 (0.47, 1.53)	0.75 (0.42, 1.39)	1.77 (0.95, 3.57)	1.66 (0.88, 3.36)	0.70 (0.44, 1.12)	0.70 (0.44, 1.12)	1.27 (0.95, 1.71)	1.23 (0.92, 1.66)	1.09 (0.68, 1.78)	1.15 (0.71, 1.88)
5. Understand how to avoid	0.77 (0.54, 1.10)	0.81 (0.57, 1.17)	1.17 (0.65, 2.20)	1.31 (0.71, 2.49)	0.82 (0.48, 1.45)	1.01 (0.58, 1.81)	0.95 (0.60, 1.53)	0.95 (0.59, 1.55)	*0.43 (0.32, 0.56)	*0.42 (0.32, 0.56)	1.18 (0.75, 1.89)	1.11 (0.70, 1.80)
6. Understand when to test	0.85 (0.60, 1.20)	0.90 (0.63, 1.28)	0.92 (0.52, 1.62)	1.02 (0.57, 1.81)	0.96 (0.55, 1.65)	1.18 (0.67, 2.07)	1.01 (0.64, 1.58)	1.02 (0.64, 1.60)	*0.43 (0.33, 0.56)	*0.43 (0.32, 0.56)	*1.69 (1.10, 2.63)	*1.63 (1.05, 2.56)

Notes: Adjusted for age and gender; ***p* < .05; [a]non-Māori, non-Pacific comparison group for both; [b]female comparison group for both; [c]age >30 years comparison group; [d]urban comparison group.

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