



# Health services for sexually transmitted infections: where are we at in New Zealand?

## A narrative literature review

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### ABSTRACT

**INTRODUCTION:** Sexually transmitted infection (STI) rates continue to rise in New Zealand. To effectively prevent, test and diagnose STIs in a timely manner to limit their health effects, health services must be appropriate and accessible for all.

**AIM:** The aim of this review was to identify and collate the existing literature and identify gaps in research relating to STI health service delivery in New Zealand.

**METHODS:** A critical narrative literature review was conducted. A keyword search of PubMed (2010 to October 2020), EMBASE (2010 to October 2020) and Google Scholar (2010 to October 2020) was conducted. The electronic search was supplemented with manual screening of references from identified articles. Eligible studies reported on STI service delivery in New Zealand. Articles not meeting these criteria were excluded. Articles solely reporting on the human papillomavirus vaccine or condom use statistics or perceptions were also excluded. Data extracted included study year, authors, aim, methods and outcome results.

**RESULTS:** A total of 179 articles were identified, including 16 that met study inclusion criteria. Nine studies focused on STI testing, five on health-seeking behaviours and two had other foci. The results reflected substantial gaps in the funding and delivery of best-practice STI management across all New Zealand.

**DISCUSSION:** New strategies are needed to improve access to low-cost or free services for sexual health care in general and clinic-wide systems implemented to enable routine delivery of advice about STI prevention and testing by clinicians to patients.

**Keywords:** Health service delivery; New Zealand; sexually transmitted infections

### Introduction

Sexually transmitted infections (STIs) are a persistent public health concern for countries worldwide. It is estimated that globally more than 1 million STIs are acquired each day and that many remain undetected and asymptomatic.<sup>1</sup> This disease burden places great stress on health-care systems, including interventions targeted towards prevention, screening and treatment. Additionally, other consequences of STIs are emerging, including

increased drug resistance (eg fluoroquinolones, macrolides) and poor outcomes for maternal and foetal health. Efficiency and effectiveness of delivery of STI prevention, screening and treatment services must therefore be a priority for health systems.<sup>2</sup>

In New Zealand, STIs are not notifiable (except syphilis and gonorrhoea, on an anonymized basis since 2017). Therefore, surveillance efforts are based on voluntary provision of data from laboratories and clinics. From 2017 to 2019, reported cases

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## WHAT GAP THIS FILLS

**What is already known:** Sexually transmitted infection rates are rising in New Zealand and new services are needed to reduce the spread and effect of these infections.

**What this study adds:** This research highlights the lack of current STI health services and health service research in New Zealand. There is a need for new and innovative services that reach all New Zealanders.

of syphilis, gonorrhoea and chlamydia have increased, particularly among people aged 15–29 years, men who have sex with men and people living in urban areas. Māori and Pasifika also continue to have higher rates of disease than other ethnic groups. The rate of congenital cases and in children aged 0–4 years is also increasing, highlighting the need to improve STI screening during pregnancy.<sup>3</sup>

The differing patterns of disease among ethnic groups, across geographical settings and in sexual behaviour suggest that a range of strategies is needed to control STIs in New Zealand. A possible way of improving STI screening, identification and treatment may be identifiable through critical analysis of how these health services are delivered. Taking a health services research approach to this problem provides an all-encompassing view of the problem, including the social, political, economic and cultural factors that may influence effective and efficient service delivery.<sup>4</sup> Finding gaps in practice or policy may help identify how to optimise health services and, in turn, improve patient health outcomes. For the case of STIs, this may include achieving a greater understanding of high-risk populations and their preferences for seeking and receiving care; monitoring shifting trends in uptake of prevention initiatives; and analysing policy decisions that may restrict more innovative and useful services for all New Zealanders.

Given the persistence of STIs as a major health problem in New Zealand and the need for effective and efficient health service delivery, the aim of this review was to identify and collate the existing literature and identify gaps in research relating to STI health service delivery in New Zealand.

## Methods

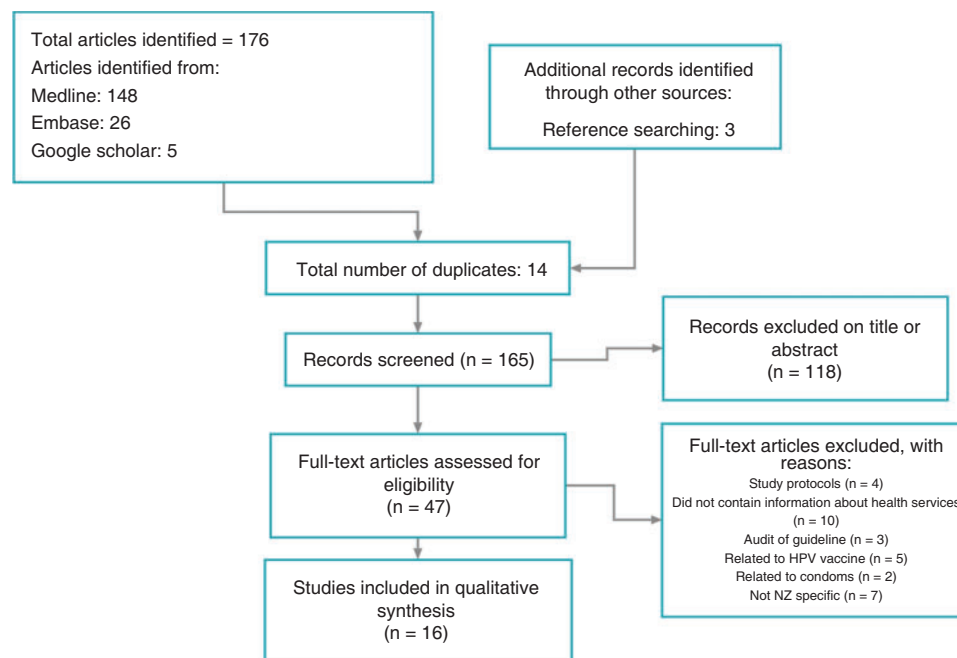
A critical narrative literature review was conducted using the databases Medline, EMBASE and Google Scholar. Authors followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement for reporting systematic reviews and meta-analyses of studies that evaluate health-care interventions for this study.<sup>5</sup>

Keywords used in the search included ‘sexually transmitted infection’, ‘sexually transmitted disease’, ‘STI’, ‘STD’, ‘gonorrhoea’, ‘syphilis’, ‘human immunodeficiency virus’, ‘HIV’, ‘human papillomavirus’, ‘HPV’, ‘genital herpes’ and ‘chlamydia’. Keywords were combined using ‘OR’ and then searched by combining with ‘New Zealand’ using ‘AND’. The search was limited to English language and human studies published between January 2010 and October 2020 to ensure the return of service delivery findings that were relevant and current. After each search, titles and abstracts were reviewed by both investigators. Articles were pulled for full-text review if they reported on STI service delivery in New Zealand. Full-text articles were reviewed by both investigators then consensus for inclusion was achieved for all articles against the inclusion and exclusion criteria during a face-to-face meeting. A flowchart of the search strategy and reasons for exclusion is provided in Figure 1.

Articles about STI service delivery were defined as any article that reported on a service or an outcome (including patient perception) relating to service delivery. Articles that reported frequency of use of services were also included. Audits of guidelines were not included. Articles not meeting these criteria were excluded. Articles solely reporting on HPV vaccine (which is now fully funded on the New Zealand immunisation schedule) or condom use statistics or perceptions were also excluded.

The following data were extracted from each article by one investigator: author, year of publication, journal, title, study aims, methods, key findings and implications for service delivery. Notes on study limitations and markers of quality were also documented. After extraction of all data, investigators met on multiple occasions to interpret findings and synthesise the results of the review.

Figure 1. Flowchart summary of the search strategy.



## Results

The search strategy yielded 179 articles. A total of 47 were downloaded for full-text review. After full-text review, 16 eligible articles remained, including five related to health-care seeking behaviour of patients; nine related to facilitators and barriers to STI testing; and two were defined as 'other' (Table 1).

### Health-care-seeking behaviour

One study investigated the health-care-seeking behaviour of people with STI symptoms attending a sexual health clinic.<sup>6</sup> A total of 243 patients completed a questionnaire to elicit their behaviours. The presence of symptoms was the most commonly identified reason for seeking care (39.4%). Most respondents (62.4%) had been tested before and 24.3% of the sample had a previously diagnosed STI. Of the patients with symptoms, 41.7% waited more than 7 days to seek care and the median length of time between symptom onset and health-care seeking was 5.5 days. Of 85 patients with symptoms who answered a section on sexual behaviour, 26 (30.6%) continued to have sex after symptom onset and before seeking care. This study showed that the presence of symptoms is important, yet some

patients do not modify their sexual behaviours during periods of active symptoms, which may increase the risk of STI transmission to sexual partners.

Another study investigated factors associated with self-reported STIs and sexual health checks in gay and bisexual men.<sup>7</sup> Data were analysed from 3138 responses to the 2011 Gay Auckland Periodic Sex Survey and Gay Online Sex Survey. Of all respondents, 1544 (48.6%) reported a sexual health check or STI treatment in the previous 12 months. Participants were almost evenly split on whether they visited a general practitioner (48.0%) or a sexual health clinic (44.4%) for their check. Other services utilised were New Zealand AIDS Foundation clinics or 'somewhere else'. People who visited a sexual health clinic were more likely to report being diagnosed with an STI. Reporting a sexual health check was more common for people with more sexual partners, having anal intercourse and people who were HIV positive. This study showed that STI service delivery efforts must focus on both sexual health clinics as well as general practices. Findings also suggest efforts may be required to educate targeted populations about STI health services and testing, particularly for people who may feel safer

Table 1. Summary of identified studies

| Author/Year                              | Aim   | Methods                             | Results   |
|--|---|-------------------------------------|---|
| <b>STI testing</b>                       |   |                                     |   |
| Rose <i>et al.</i> 2020 <sup>18</sup>    | To describe retesting and reinfection rates for chlamydia or gonorrhoea in regions of New Zealand.  | Retrospective cohort                | 34% of patients were retested within the recommended period. The odds of retesting were lower for Males, Māori and Pasifika ethnicities groups. 15- to 19-year-olds were more likely to be retested.  |
| Rose <i>et al.</i> 2020 <sup>19</sup>    | To determine whether rates of testing for reinfection can be improved in primary care settings by clinician education about retesting, verbal and written patient information and implementation of a text reminder system. | Before and after intervention       | 25% were retested during the control period and 48% during the intervention period. Retesting rates increased across most demographic groups, with at least two-fold increases observed for men, those aged 20–29 years and Māori and Pasifika ethnic groups. |
| Denison 2018 <sup>13</sup>               | To elucidate drivers to STI testing in university students.   | Interviews                          | Five drivers for testing include: crisis, partners, clinicians, routines, previous knowledge.   |
| Rose <i>et al.</i> 2017 <sup>17</sup>    | To determine rates of testing and repeat positivity for chlamydia and gonorrhoea.   | Retrospective cohort                | 29% of patients were retested within the recommended period. Low rates retesting were associated with males, Māori, Pasifika ethnic groups.   |
| Denison <i>et al.</i> 2017 <sup>12</sup> | To investigate barriers to testing for university students.   | Interviews                          | Three main types of barriers are personal, structural, social.  |
| Ludlam <i>et al.</i> 2015 <sup>11</sup>  | To estimate GP knowledge of sex orientation and to examine if HIV/STI screening is associated with that knowledge.  | Survey                              | Those with a GP who is aware of their sexual orientation were more likely to have a HIV test and twice as likely to have a STI diagnosed.   |
| Azariah <i>et al.</i> 2013 <sup>16</sup> | To increase opportunistic testing in people aged <25 years and to improve documentation of partner notification in primary care.  | Before and after intervention pilot | During the pilot, there was a 300% increase in the number of chlamydia tests in the target age group (<25 years) from 812 to 2410 people. The pilot resulted in better documentation of patient follow up in the patient management system.                   |
| Morgan <i>et al.</i> 2012 <sup>15</sup>  | To ascertain if there were any sustained (for 1 year) changes in chlamydia testing patterns by age, gender or ethnicity in response to the implementation of chlamydia management guidelines in Waikato.                    | Retrospective testing data analyses | Primary care guideline implementation was not associated with a sustained increase in district-wide chlamydia testing.  |
| Ekeroma <i>et al.</i> 2009 <sup>14</sup> | To determine the screening rate for, and the prevalence rate of, STIs in pregnancy at Midlemore Hospital.   | Retrospective chart review          | 64% of women were screened in pregnancy for an STI. Higher proportions of Māori and Pasifika women were screened compared to other groups and younger women were screened more compared to older women.   |
| <b>Health-care-seeking behaviour</b>     |   |                                     |   |
| Denison 2018 <sup>6</sup>                | To determine health-care-seeking behaviours of people attending a STI clinic.   | Survey                              | Having symptoms was the primary reason for seeking health care. 41% with symptoms waited >7 days. 30% had sex after symptoms but before seeking care. Also reported frequent condom use.  |
| Wilson <i>et al.</i> 2017 <sup>9</sup>   | To compare digital assistant and google advice on sexual health.  | Trial                               | Digital assistants are worse than a laptop-based Google search.   |
| Dickson <i>et al.</i> 2015 <sup>7</sup>  | To determine incidence of self-reported STIs and sexual health checks in MSM populations.   | Survey                              | 40% had a check up in the last year – lower in Asian and Pasifika men, those identifying as bisexual and those recruited online. HIV +, anal sex, multiple partners more likely to seek a check up.   |

(Continued)

Table 1. (Continued)

| Author/Year                             | Aim  | Methods  | Results   |
|---|--|--|---|
| Morison <i>et al.</i> 2015 <sup>8</sup> | To explore barriers to safer heterosexual sex in re-partnering midlife women.  | Interviews   | Midlife and older women are more vulnerable to risk behaviour for STIs. They did not know how to raise the topic of sexual health with their GP and would like them to initiate the discussion of sexual health opportunistically.  |
| Psutka <i>et al.</i> 2012 <sup>10</sup> | To describe the characteristics of sexual health clinic attendance and STI diagnoses during the Rugby World Cup (RWC) in New Zealand in 2011.  | Retrospective attendance data review and cross-sectional survey of attendees | There was no statistically significant increase in clinic attendance or STI diagnoses during the RWC compared with previous years. Most attendees (74%) who had RWC-related sex had consumed three or more alcoholic drinks; 22% had used a condom. Seven percent of women reported non-consensual sex.   |
| <b>Other</b>                            |  |  |   |
| Rose 2019 <sup>19</sup>                 | To test the acceptability and utility of strategies designed to facilitate the delivery of clinical best practice for patients diagnosed with chlamydia or gonorrhoea in primary care. | Before and after intervention  | During the intervention, substantial improvements were observed in documented patient management (sexual history, partner notification, and outcomes, $P < 0.05$ ). Increases were observed in percentages of patients reached for follow up (74% vs. 26% at baseline, $P < 0.05$ ) and partners reported to have been notified (79% vs. 23%, $P < 0.05$ ). |
| Ryder <i>et al.</i> 2015 <sup>21</sup>  | To explore views of service providers for the Condom Card Scheme – where adolescents get free condoms if present their Condom Card.  | Interviews   | Scheme was perceived positively, but some barriers were identified.   |

MSM, men who have sex with men; STI, sexually transmitted infection; GP, general practitioner; HIV, human immunodeficiency viruses.

due to fewer sexual partners, a negative HIV status and not performing anal sex.

Morison and Cook investigated mid-life safer sex challenges for heterosexual women who were re-partnering or in casual relationships.<sup>8</sup> Despite a primary focus on barriers to safer sex, some results related to health service delivery. The study reported themes interpreted from interviews with eight women aged 40–69 years. Among the many barriers to safer sex identified, barriers related to service delivery included silent general practitioners (GPs) and midlife context. GPs, even though given ample opportunity to discuss safer sex practices and STIs, were reported to not initiate discussions. Participants felt obtaining information about safer sex would be easier from a sexual health clinic, rather than their own GP. The midlife context was interpreted as a lack of awareness of STIs, possibly due to a generational gap. Prior to marriage, it was mentioned that the focus for these women was about pregnancy and not STIs. These findings are important for service delivery with

respect to GP awareness of the need for education and STI service provision in this emerging target population.

Wilson *et al.* undertook a study to determine how well technology delivered health services in terms of answering questions on sex, as many people search online for sexual health-related information.<sup>9</sup> The researchers asked Siri and Google assistant 50 questions based current sex-related news and topics from a national UK sexual health website to test their ability to locate local services and provide answers, pictures or videos (eg ‘tell me about contraception’). A laptop-based Google search performed much better than the two digital assistants, and Google Assistant performed better than Siri (50% of best [or equal best responses] vs. 32%). Many questions were lost in translation; for example, Siri’s response to ‘Tell me about menopause’ was to suggest the show *Menopause the Musical* in Wikipedia. This study suggests that for adolescents, appropriate smartphone and internet searches could be evaluated as a component of school-based

sex education or as part of a broader health education or digital literacy courses.

Finally, a study investigating sexual health clinic attendance and reason for attendance during the Rugby World Cup was investigated to determine the characteristics of the attending people and the effect of a large nationwide event on health-care-seeking behaviours. They found the event had no significant increase in STI diagnoses or attendance at a clinic. However, most attendees (74%) who had Rugby World Cup-related sex had consumed three or more alcoholic drinks and 22% had used a condom. Seven percent of women reported non-consensual sex.<sup>10</sup>

### Facilitators and barriers to testing

Ludlam *et al.* completed a study examining how GP knowledge of sexual orientation influenced STI testing and outcomes.<sup>11</sup> Anonymous data were analysed from the Gay Auckland Periodic Sex Survey in 2014. Approximately half of respondents (50.5%) believed their GP to be aware of their sexual orientation. GP awareness of sexual orientation was associated with increases in ever having a specific sexual health check (anal swab, throat swab, penile swab, urine sample, blood test for syphilis), a recent (<12 months) specific STI test and a recent (<12 months) STI diagnosis (gonorrhoea, chlamydia, non-specific urethritis, genital or anal warts, syphilis, lymphogranuloma venereum). These findings suggest that GP awareness of sexual orientation may facilitate testing and result in more efficient diagnosis of STIs.

Another two papers investigated the barriers<sup>12</sup> and facilitators<sup>13</sup> to STI testing among university students in New Zealand. Interviews were conducted with 24 students who had previously visited a university STI clinic and had completed a questionnaire about their visit. The authors interpreted three major themes for barriers to testing: personal barriers, structural barriers and social barriers. Personal barriers included under-estimation of risk; perceiving STIs not to be serious; fear of invasive procedures; self-consciousness in genital examination; and being too busy. Structural barriers included the financial cost of STI tests, service-related barriers (appointment booking, inconvenience of laboratory testing) and clinician attributes and attitude (such as gender mismatch). Social

barriers focused on the concern of being stigmatised. The study found that interventions to improve STI-related health service delivery may need to target not only patients, but also the service structure and attitudes of staff members.

There were five facilitators for seeking STI testing: crisis, partners, clinicians, routines and previous knowledge. Crisis facilitators included developing symptoms or finding out that a previous sexual partner had been diagnosed with an STI. Two of the facilitators were related to advice from partners and clinicians, such as opportunistic advice of a doctor or nurse who suggested an STI test while the individual was attending the clinic for a different reason. Routine drivers were reported by some participants who had regular STI tests as part of their routine health care. The knowledge driver intersected with the other four, but most prominently in relation to routine-driven testing, whereby better knowledge encouraged more regular testing. These findings suggest that interventions aiming to improve knowledge about sexual health and STI testing or providing advice and recommendations for testing could encourage more people to seek STI testing.

To determine the screening rate for, and the prevalence rate of, STIs in pregnancy at Middlemore Hospital, a record review was undertaken of all women ( $n = 6795$ ) who had a baby in the hospital in 2009:<sup>14</sup> 64% of women were screened in pregnancy for an STI. Lead Maternity Carers were more likely to have requested a test than hospital midwives. A higher proportion of younger women and women of Māori and Pasifika ethnicity were screened compared to other groups. This study highlights how education of both women and maternity providers is important in prevention and detection of STIs in pregnancy.

Morgan *et al.* examined the effect of the release of a chlamydia management guideline in the Waikato, finding no significant increase in testing or treatment rates for the region during or after guideline implementation, compared to before the implementation. No differences in testing or treatment were seen by age or ethnicity.<sup>15</sup>

In a nurse-led 4-month study involving 10 primary care practices in South Auckland, a chlamydia test was offered by nurses to all sexually active people



aged <25 years.<sup>16</sup> This resulted in a 300% increase in testing rates for chlamydia, compared to pre-intervention: 1715 (47%) of 3687 patients in the target age group presenting at the practices were tested. The study also resulted in recording in the patient management system more follow-up investigations and outcomes of partner notification information. This was not previously routine practice.

A retrospective cohort study was conducted between 2012 and 2015 to investigate factors associated with rates of retesting following diagnosis of chlamydia or gonorrhoea in one geographic area of New Zealand.<sup>17</sup> Overall, 6530 cases were documented and 1919 were retested (29%). Being male, Māori, and Pasifika ethnicities lowered odds for retesting. These findings identify high-risk groups for non-adherence to retesting guidelines, which could inform future targeted interventions to improve retesting rates.

Rose *et al.* repeated this study between 2015 and 2017 in four higher-STI-rate regions of New Zealand.<sup>18</sup> Overall, a total of 9241 cases were documented and 3151 were retested (34%) within the recommended period. The odds of retesting were lower for males, Māori and Pasifika ethnic groups. Compared with people aged 20–24 years, people aged 15–19 years were more likely to be retested.

In a follow up to these two studies, Rose *et al.* undertook a before-and-after intervention study set in six New Zealand primary care clinics;<sup>19</sup> they provided clinician education, patient advice about reinfection risk reduction and retesting and the introduction of SMS text reminders inviting patients to return for a test of at 2–3 months' post-treatment. Overall, 25.4% were retested during the control period and 47.9% during the intervention period. Retesting rates increased across most demographic groups, with at least two-fold increases observed for men, people aged 20–29 years and Māori and Pasifika ethnic groups. This study suggests that these simple strategies could be widely implemented in primary health-care settings as a way to improve testing and retesting rates.

## Other

Rose *et al.* conducted a 9-month intervention aiming to provide best clinical practice for patients

with chlamydia or gonorrhoea. The participating clinics ( $n = 6$ ) could either up-skill in the management of STIs or opt to have the assistance of a specialist sexual health advisor (who then led the care of these patients). Compared to before the intervention, clinical documentation showed a significant improvement in documented STI management, more frequent follow up and documentation of self-reported partner notification outcome for both intervention groups ( $n = 287$ ).<sup>20</sup>

Ryder *et al.* explored the perceptions of service providers in a pilot Condom Card Scheme, where adolescents in Hawke's Bay could access free condoms from pharmacies on presenting a Condom Card.<sup>21</sup> Interviews with 17 service providers (nurses and pharmacy staff) found universal support of the scheme and believed that pharmacies were the right place to run such a service due to long open hours, especially during weekends and school holidays. There were concerns over lack of advertising and the sustainability of the scheme, with some thinking it too expensive for the benefits obtained and the reach. As there were limited pharmacies participating, they felt that some adolescents may miss out. This study highlights the importance of gaining feedback from both service users and service providers when developing new sexual health services in the community.

## Discussion

We identified 16 studies reporting on either health-seeking behaviours or STI testing. Study populations were diverse, ranging from service providers, adolescents, gay and bisexual men, older and mid-life partnering women and event attendees. These studies were mainly small, retrospective and used interviews or surveys to elicit data, in a range of health-care settings including general practices, pharmacies, sexual health clinics and hospitals. Only three studies were prospective. The review clearly highlights a lack of funding for sexual health and STI research and most likely practice in New Zealand.

## Practice implications: health-seeking behaviours

From the few studies examining health-seeking behaviours for STIs, there were low rates of

participants seeking health checkups or health care, with approximately half of men who have sex with men reporting a STI health check in the past year, and there was little effect on behaviours as a result of a large nationwide event (the Rugby World Cup). Health-seeking behaviours were more common among people at higher STI risk. Older women interviewed were both uninformed and susceptible to sexual health risks and would prefer GPs to raise the topic during consultations. International studies on STI health-seeking behaviour tend to be conducted in developing countries or in vulnerable populations such as sex workers and lend few suggestions for strategies to implement in New Zealand.<sup>22,23</sup> It would be beneficial to know what services would encourage more STI health-seeking behaviour in New Zealanders. The one study that used online resources for sexual health found good information, but there is a need for further research to ensure that all sexual health advice searches, including searches using slang, colloquialisms or New Zealand accents, are directed to high-quality sites with up-to-date, evidence-based recommendations.

### Practice implications: STI testing

Both STI testing and retesting rates across all studies were low, including testing of pregnant women for whom testing is best practice.<sup>24</sup> Failure to seek testing or re-testing of STIs may have a large effect on health through delayed diagnosis and treatment or the transmission of infection to others.<sup>2,25</sup> The main barriers found in this review to receiving testing or retesting were factors such as underestimation of risk, perceiving STIs not to be serious, costs related to testing and stigmatization or perceived judgment of staff. Incentivising STI testing through payment, competitions or vouchers has been identified as a useful tool to modify health behaviour; however, it is unknown how this would be received in New Zealand.<sup>26</sup>

Facilitators for testing were increased knowledge and awareness of STIs and testing by patients. Another strong driver is the recommendation of testing by a health professional; this was seen in multiple studies and was especially noticeable where there appeared to be good clinician-to-patient relationships. For example, in the pregnancy study, Lead Maternity Carers were more likely to

test for STIs than independent midwives. Lead Maternity Carers see women throughout their pregnancy and are likely to know more about them and have established positive relationships than hospital midwives who do not tend to know women as well. In the study with gay, bisexual and other men who have sex with men, men whose GP was aware of their sexual orientation were more likely to have ever had a HIV test, specific STI tests and were twice as likely to have had an STI diagnosed. Although the release of guidelines had little effect on the rates of testing, a 'cover all' approach with opportunistic testing saw large increases in testing of young people. It is well accepted that the release of guidelines without increased funding for their implementation has little effect.<sup>27</sup>

This review indicates there is a need to prioritise the implementation of processes to support clinicians in the routine delivery of best practice sexual health care. Supportive measures should include education about ensuring a compassionate and non-judgmental environment and recommending routine provision of patient advice about retesting and strategies to promote timely and equitable access to testing. Upskilling nurses or linking practices to sexual health experts showed improvement in the management of STIs. More widespread or national programmes with these types of initiatives would likely be of widespread benefit.

### Inequities in sexual health

These findings reflect substantial gaps in the delivery of best practice STI management across New Zealand. With STI infection rates increasing, we need to think differently about the way we provide services to ensure accessible and acceptable services. New Zealand has known health inequity issues and these are also evident in sexual health.<sup>28</sup> In the studies where ethnicity was reported, people of Māori and Pasifika ethnicity were identified as having poorer testing and retesting rates in all studies except one (pregnancy screening), and they were less likely to seek a health checkup than people of other ethnicities. In general, people living in low sociodemographic or rural areas were reported to have worse health outcomes.<sup>28</sup> The studies in this review did not include or report on patients from these demographics. Out-of-facility approaches to improve STI testing (eg mail-out services or street



outreach) have been trialled in other countries with positive effects, particularly in vulnerable populations. These methods could easily be adopted in New Zealand.

## Future research

This review has implications for future research. First, there is a general lack of STI literature that focuses on and is relevant to New Zealand. This is most likely linked to a lack of dedicated funding to advance sexual health in New Zealand. There were also some gaps in study settings, with no studies reporting outcomes in rural locations or in culturally focused settings such as Kaupapa Māori services. Studies failed to include evidence on the acceptability of services for patients; one study perceived the Condom Card Service positively, but this was from the perspective of service providers rather than service users. Research focusing on these areas along with larger and more interventional studies would help progress STI services in New Zealand.

## Conclusion

New strategies are needed to improve access to low-cost or free services for sexual health care in general, and clinic-wide systems implemented to enable routine delivery of advice about STI prevention and testing by clinicians to patients. More culturally appropriate, safe, relevant and wider-reaching services and research are needed to ensure equitable access to STI services. A focus on education and knowledge gain for patients could see improvements in health outcomes over the long-term.

## Competing interests

The authors have no competing interests to declare.

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