# Does a clinical guideline change chlamydia testing? Report from the Waikato Chlamydia Project

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## ABSTRACT

**BACKGROUND AND CONTEXT:** Waikato District Health Board was one of three districts chosen to implement a national chlamydia management guideline, with the aim of optimising testing and treatment. Previous New Zealand studies suggest any test increases associated with such an intervention may be short-lived.

**ASSESSMENT OF PROBLEM:** District-wide chlamydia test volumes were compared for three periods, before (June–Nov 2008), during (June–Nov 2009) and after (June–Nov 2010) guideline implementation by age, gender and ethnicity. Crude estimates of population test uptake were calculated. Azithromycin pharmacy claim volumes were assessed as a measure of treatment.

**RESULTS:** Chlamydia test uptake for women was already high, with 23% of 15- to 24-year-old women tested during the period from June to November 2008. Although tests from under-25-year-olds increased during implementation in 2009, the change was not significant and was not sustained in 2010, $p$=0.06. Similarly, there were no significant sustained changes by gender or ethnicity following implementation.

**STRATEGIES FOR IMPROVEMENT:** This includes a continued emphasis on optimal chlamydia case finding and treatment by focusing on those at greater risk of infection. Efforts to improve partner notification should be instigated which may in turn better engage men around sexual health.

**LESSONS:** Local data should be used to identify local issues. There is a need to determine whether <25 years is the optimal age threshold for targeted chlamydia testing in New Zealand and to ensure appropriate resources, training and support are in place for primary care nurses who play a pivotal role in sexual health care delivery.

**KEYWORDS:** Chlamydia trachomatis; mass screening; practice guidelines; primary health care; contact tracing

## Background

*Chlamydia trachomatis* infection (chlamydia) is a significant public health problem, and untreated infection may lead to salpingitis, tubal scarring, ectopic pregnancy and sub-fertility in some women.[1] It remains the most commonly reported bacterial sexually transmitted infection (STI) in New Zealand,[2] with the rate of hospital admissions for chlamydia-related pelvic infections in women aged 15–24 years rising recently.[3] In addition, data suggest disparities for Maori, with sentinel surveillance clinic rates of chlamydia infections being 2.5 times that of non-Maori.[2] Uncertainty continues over the merits of a screening programme, however, with randomised evaluations of different screening approaches ongoing in the Netherlands and in Australia.[4]

In 2008, the New Zealand Ministry of Health drafted the first national guideline for chlamydia management which emphasised targeted testing of those with risk factors, particularly under-25-year-olds.[5] Three districts, Waikato District Health Board (DHB), Lakes DHB and an Auckland Primary Health Organisation (PHO), were chosen to assess guideline implementation impact with particular interest in laboratory test volumes. Pilot selection was based on factors that included

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at least some free or very low cost primary care access for under-25-year-olds, laboratory engagement, and clinicians' willingness to participate.

Effective guideline implementation might significantly increase laboratory testing, as reported by other interventions in New Zealand.[6-8] In Northland, testing and case detection amongst under-25-year-old Maori males increased in 2006–07, during an intervention that included social marketing, community health promotion, outreach screening and funding to improve access to existing health services.[6] Increased testing rates were also noted during an incentivised general practice study of opportunistic chlamydia screening in Wellington.[7] However, the latter also noted that the increases were not sustained, with testing rates returning to baseline within three months,[7] an experience supported by others.[8] Our primary aim, therefore, was to examine Waikato DHB's chlamydia test volumes a year after guideline implementation in 2009, to ascertain if any changes in testing patterns by age, gender or ethnicity were sustained. Secondary aims were to assess crude estimates of population test uptake and also to examine any changes in treatment over time, using dispensed volumes of azithromycin as a measure.

## Assessment of the problem

Waikato DHB had an estimated resident population of 357 000 in 2008, of whom approximately

*Figure 1. Waikato DHB chlamydia project phases of planning, implementation and evaluation*

21% were Maori compared with 15% nationally, serviced by approximately 300 GPs. A multidisciplinary project advisory group gathered local information for project planning (Figure 1). Laboratory test data were used to determine chlamydia test uptake by age, gender and ethnicity in Waikato DHB for the first time. Details of this analysis have been reported elsewhere.[9] In summary, baseline chlamydia test uptake for women under 25 years of age was much higher than expected and with similar testing rates for Maori and non-Maori. Among tests from 15- to 24-year-old females, 14% of tests were positive with positivity double amongst Maori, 24.2% vs 12.5%.[9] Discussions were held with a group of 15 GPs from both rural and urban settings and with a group of five rural-based practice nurses around opportunistic testing for chlamydia. Participants reported existing awareness of chlamydia as a significant issue and that they were 'already testing' young women, supporting findings from the baseline test analysis.

Consequently, the project advisory group shifted the project's focus from simply raising awareness of offering opportunistic testing to a greater emphasis on ensuring those likely to have higher rates of infection, namely those under 25 years of age or Maori, were offered testing, and ensuring optimal case management of those identified with infection. The Ministry of Health supported this change. Likely barriers and enablers to changing clinical practice were identified by reviewing published literature and from further discussion with local providers.[10–12]

Some discussants suggested additional interventions, such as computer alerts to prompt an offer of testing, but others had negative views about these. Audit was felt to be a useful tool; some discussants felt their practice had changed after participating in a Best Practice Advocacy Centre Ltd (bpac$^{nz}$) audit of how often practitioners undertook chlamydia testing in early 2009.[13] Clear guidance on testing and treatment was thought likely to be helpful, with suggested improvements to national chlamydia print resources. Subsequently, these national materials were adapted by the project advisory group, following national guidelines,[14] for use in Waikato DHB initially. A hard-copy, one-page health provider summary flowchart of chlamydia testing and case management was disseminated and made available as a downloadable file on Waikato DHB's website.[15] Local health promoters facilitated a rangatahi Maori focus group which led the design of a youth-friendly chlamydia patient information leaflet. The Auckland chlamydia project in 2010–11 planned to use, and possibly further modify, the adapted materials prior to any national roll-out. Raising young people's awareness of the issue was felt to be important, but the project did not include any funding for social marketing.

Two laboratories perform all chlamydia testing for Waikato DHB and provided data on all tests carried out on residents from 1 February 2008 to 31 January 2011. All samples were tested using nucleic acid amplification methods. Non-genital site samples and same-day duplicate samples for any individual were excluded. Chlamydia test volumes for three, six-month periods—before (June–Nov 2008), during (June–Nov 2009) and after (June–Nov 2010) project implementation—were compared using the Kruskal–Wallis equality of populations rank test for non-parametric data, with further comparisons of test volumes by age, gender and ethnicity.

Crude population test uptake was estimated by dividing the number of chlamydia tests by age-, gender- and ethnicity-specific resident population estimates.[16] Repeat tests for any individual were not excluded. Waikato DHB community pharmacy monthly claims during the period 2008–2010 for the antimicrobial drug azithromycin were collated.

## WHAT GAP THIS FILLS

**What we already know:** Chlamydia infection is a significant public health problem and warrants an improved control strategy. There is international debate on how best to achieve chlamydia control, but there is agreement and increasing emphasis on the role of primary care.

**What this study adds:** Primary care guideline implementation was not associated with a sustained increase in district-wide chlamydia testing, possibly because testing rates among young women were already high or, even though participants reported their practice had or would change, the project did not measure testing rates by provider. Primary care nurses play a pivotal role in delivering sexual health care, and must be supported with appropriate resources and training opportunities.

Claims excluded hospital or bulk-funded treatments but included prescriber supply orders. Age, sex and ethnicity were ascertained for pharmacy claims with a National Health Index number.

Analysis was carried out using statistical package R version 2.13.0 (R Foundation for Statistical Computing, 2011). A Bonferroni-corrected *p*-value of <0.003 for significance was used for the multiple comparative analyses.

## Strategies for quality improvement

A district-wide audit of chlamydia cases diagnosed during 2008 was undertaken in June and July 2009. Details of the audit have been reported elsewhere[17] and are summarised here. Any setting within Waikato DHB with 25 or more positive chlamydia test results during 2008 was invited to participate. Each site was provided with a list of their laboratory-identified cases and asked to complete a proforma for each of 20 consecutive cases. Twenty sites across a range of clinical settings were eligible. This included nine rural general practices, three urban general practices, a family planning clinic, a sexual health clinic, a community accident and medical centre, a remand prison, a university-based student health service, secondary school–based student health services, a hospital-based emergency department and a hospital-based acute gynaecological service. All sites agreed to participate and 19 of 20 were able to provide data. The non-participating site was the remand prison. Combined, these sites detected 70% of 2258 urogenital chlamydia cases diagnosed in Waikato DHB during the period 1 February – 31 October 2008. Each site self-determined who would collect case data and complete the audit proformas, with most sites opting to share the task amongst medical and nursing staff. Seven sites chose to complete proformas for more than 20 cases (range 21–37), giving a sample of 415 cases (18%) of all Waikato DHB genital chlamydia cases diagnosed during the 2008 time period.

The indicators of interest were: reason for testing, appropriate sampling, immediate treatment given for presumed chlamydia infection where there was a high index of suspicion (e.g. known contact of chlamydia infection, male patient with urethral discharge) without waiting for laboratory confirmation; standard recommended treatment given; test-of-cure a month later recommended if the patient was pregnant; partner notification discussed at the time of treatment; all recent sexual contacts notified that they require testing and treatment. The standard recommended treatment for uncomplicated infection is azithromycin 1 g stat dose orally or doxycycline 100 mg twice daily orally for seven days.

The case audit found a high standard of documented care on some indicators, such as appropriate sampling, appropriate choice of antibiotic and timely treatment, but other aspects of care, such as partner notification, were not well documented. Importantly, non-Maori were more likely to have clear documentation of receiving any antibiotic treatment.[18] Discussions with audit participants about actual practice highlighted the significant role of practice nurses in testing and treatment. Participants provided helpful feedback as to ways in which their clinical practice improved post-audit and this information was included in the subsequent continuing medical education (CME) sessions.

Three face-to-face CME meetings were planned within existing primary care CME networks. Session content, which included results of the baseline testing analysis and the district-wide case audit, was reviewed with a local GP clinical advisor. Local PHO staff facilitated the meetings, with the same speaker (JM) on each occasion. The meetings occurred during late September to mid-November 2009, with registered attendance of 104 providers. The first CME meeting, held in the district's main urban centre and the largest of the three sessions, was recorded and made available as a CD-ROM and as a password-protected webcast on a local PHO website.

## Results of assessment

There was no significant change in overall test volumes ($p$=0.23), or in tests from those aged less than 25 years ($p$=0.06), comparing the three six-month time periods before, during and after implementation (Table 1). For the same periods, there was no significant change in test volumes for either Maori ($p$=0.14) or for non-Maori ($p$=0.36).

*Table 1. Waikato DHB chlamydia tests by year, age-band, gender and ethnicity during each period, 2008–10*

| | All Tests | | | | Tests 15–24 years | | | | Tests 25–44 years | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Males | | Females | | Males | | Females | | Males | | Females | |
| | N | %† | N | %† | N | %† | N | %† | N | %† | N | %† |
| **All tests*** | | | | | | | | | | | | |
| **Jun–Nov 08** | 2450 | 1.4% | 11404 | 6.3% | 1255 | 4.7% | 5927 | 22.9% | 942 | 2.1% | 4486 | 9.4% |
| **Jun–Nov 09** | 2621 | 1.5% | 11676 | 6.4% | 1373 | 5.0% | 6147 | 23.7% | 988 | 2.2% | 4612 | 9.8% |
| **Jun–Nov 10** | 2441 | 1.4% | 11765 | 6.3% | 1220 | 4.4% | 5931 | 22.5% | 983 | 2.2% | 4806 | 10.1% |
| **Non-Maori** | | | | | | | | | | | | |
| **Jun–Nov 08** | 1568 | 1.1% | 7662 | 5.4% | 786 | 4.0% | 3856 | 21.1% | 599 | 1.7% | 3127 | 8.4% |
| **Jun–Nov 09** | 1670 | 1.2% | 7701 | 5.4% | 864 | 4.4% | 3912 | 21.3% | 624 | 1.8% | 3155 | 8.5% |
| **Jun–Nov 10** | 1511 | 1.1% | 7699 | 5.3% | 721 | 3.6% | 3718 | 19.9% | 630 | 1.8% | 3242 | 8.7% |
| **Maori** | | | | | | | | | | | | |
| **Jun–Nov 08** | 482 | 1.3% | 2765 | 7.1% | 270 | 3.7% | 1481 | 19.6% | 182 | 2.0% | 1051 | 10.3% |
| **Jun–Nov 09** | 549 | 1.4% | 2924 | 7.4% | 303 | 4.0% | 1629 | 21.5% | 206 | 2.2% | 1094 | 10.7% |
| **Jun–Nov 10** | 581 | 1.5% | 2982 | 7.5% | 319 | 4.1% | 1553 | 20.3% | 229 | 2.5% | 1204 | 11.7% |

* All laboratory test volumes (N) for three, six-month periods before (June–Nov 2008), during (June–Nov 2009) and after (June–Nov 2010) project implementation

† Crude test uptake, calculated by dividing the number of tests by population estimates; any repeat tests included

By age and ethnicity, there was no significant change in test volumes from Maori aged less than 25 ($p$=0.24), and, although tests for non-Maori aged under 25 years appeared to decline in June to November 2010, there was no significant difference between the three time periods ($p$=0.017), as the adjusted significant $p$ value was <0.003. Similarly, an upward trend in tests for Maori aged 25 and older was observed, but there was no significant difference between the three time periods ($p$=0.06).

A year following implementation, test uptake among all women aged 15–24 years in Waikato DHB was unchanged from baseline. Uptake remained similar for Maori compared to non-Maori; 20.3% for Maori and 19.9% for non-Maori for the six-month period in 2010 (Table 1). The fivefold lower test uptake by same-age males also remained, at 4.1% for Maori and 3.6% for non-Maori during June–November 2010.

There was a twofold difference in azithromycin claim volumes for females compared to males, but the large volume of claims with unknown gender limited any interpretation of changes by gender over time (Figure 2). The large number of claims without demographic information, because of prescriber supply orders, also limited any data interpretation by age or ethnicity.

## Lessons and messages

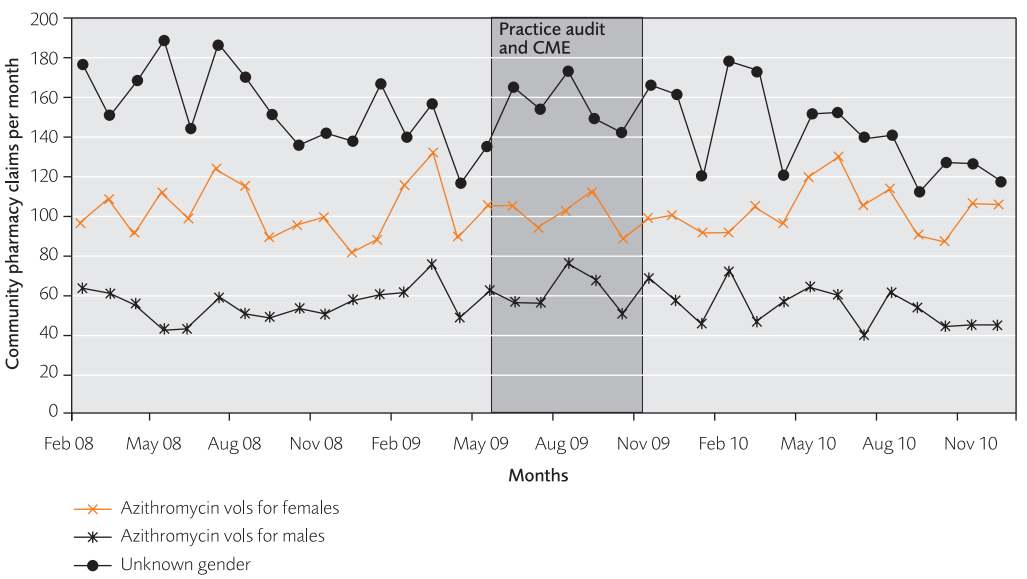
Primary care guideline implementation was not associated with a significant change in chlamydia test volumes in Waikato DHB. Although test volumes from under-25-year-olds increased during implementation, the changes were not significant and were not sustained. Project planning found baseline-testing among young women in this district was amongst the highest reported internationally, which raised the possibility that guideline implementation might not be associated with further increases. The Waikato DHB chlamydia project chose an approach thought to be very achievable for national roll-out. Although participants reported their practice had or would change, testing was not measured at the level of rates conducted by individual providers and the cumulative effect of any such changes was not sufficient to impact significantly on district-wide test volumes. Test increases reported by other New Zealand settings likely reflect a greater intensity of intervention along with target audience marketing.[6-8,19]

Implementation in Waikato DHB raised a number of issues. One was the optimal age threshold for targeting testing to those most at risk of infection. The national chlamydia guideline focuses on an age threshold of less than 25 years; local implementation noted, however, that based on test positivity by age band, baseline test analysis suggested this would disadvantage Maori aged 25–34 years. Although chlamydia test positivity is only an indicator, not an accurate measure, of disease prevalence,[20] a continued focus on only under-25-year-olds may be inappropriate in some districts and the age threshold in the national chlamydia guideline may need to be reviewed.

Another issue was that five times fewer 15- to 24-year-old males were tested in Waikato DHB than same-age females. An oft-repeated comment was 'how to reach men'. Higher test positivity amongst males in the baseline analysis suggested a focus on those with symptoms of or known sexual contacts with chlamydia. Notably, there was only a twofold gender difference in azithromycin claims, implying more males are treated without testing, and in keeping with anecdotal reports that patient-delivered partner treatment (PDPT) is commonly prescribed. The use of PDPT is discussed in the national chlamydia guideline, with modest evidence supporting its use as a tool for partner management in relation to chlamydia infections, but such prescribing without patient evaluation is not legal in New Zealand.[21] If legalisation remains unchanged, future revisions of the national guideline need to clarify this issue. Meanwhile, local implementation opted to promote other ways of improving partner management.

Partner management for bacterial STIs reduces the likelihood of the index case being re-infected and is a cost-effective case-finding strategy of those who may not otherwise be tested for STIs.[22] This latter point is relevant for Waikato DHB and other districts with low STI testing rates amongst men. With training, practice nurses can undertake partner notification that is at least as effective as referral to a specialist contact tracer.[23] The CME sessions conveyed that giving patients a verbal explanation, plus clear written information which includes treatment options for their partners, reduces infections and is as effective as PDPT.[24] The UK, with similar prescribing restrictions, is exploring nurse-led telephone consults and pharmacist-led consults for partners as alternative strategies,[25] and these options should be evaluated in New Zealand.

*Figure 2. Waikato DHB azithromycin claim volumes by month and gender, Feb 2008 to Dec 2010**




* Project implementation (provider-led case audit and CME) occurred during June to November 2009

The pivotal role of the primary care nurse in delivering sexual health care warrants mention. This was evident from focus group discussants and from audit findings. It follows that it is imperative the required knowledge and skills for this role are supported through the provision of appropriate resources and training opportunities. Another relevant issue was that nurses working in non–general practice settings, such as schools, tertiary education institutions and prisons, may not be encompassed by traditional CME networks and efforts were made to ensure project-related CME was inclusive.

The implementation of clinical guidelines in Waikato DHB was not associated with a sustained district-wide increase in chlamydia testing volumes. However, the project did provide an opportunity to highlight successes such as high chlamydia test uptake in young women, whilst identifying areas for improvement such as reaching men and partner management. Recent focus in New Zealand has been on opportunistic testing, but it is essential that effective treatment and improved partner management follow on.[26] Three guideline projects adopted differing approaches; although the other settings have not yet publicised their findings, reports have been submitted to the Ministry of Health with a summary anticipated in late 2011. It is hoped the combined findings will inform strategies toward effective chlamydia control in New Zealand.

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