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# WHAT CAN LABORATORY NOTIFICATIONS TELL US ABOUT CHLAMYDIA INFECTION?

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In New South Wales, *Chlamydia trachomatis* infection was gazetted as a notifiable disease in 1998. Subsequently the number of laboratory notifications has more than doubled between 1999 and 2002, with 5,542 cases reported in 2002.[1] This article describes the findings of an enhanced surveillance program based on the follow-up of notifications received by a Sydney metropolitan public health unit.

## BACKGROUND

Sexually Transmitted Infections (STIs) are common among adult Australians; self-reported data estimate that 20.2 per cent of men and 16.9 per cent of women have been diagnosed with an STI at some point in time.[2] *Chlamydia* has been estimated to be the cause of this infection in 1.7 per cent of males and 3.1 per cent of females.[2]

*Chlamydia trachomatis* is the world's most common bacterial STI, with an estimated 89 million new cases each year.[3] Infection can be asymptomatic and can have long-term adverse sequelae including Pelvic Inflammatory Disease (PID), ectopic pregnancy, infertility, and chronic pelvic pain.[4] In the United States, it is estimated that 25–50 per cent of the 2.5 million cases of PID that are reported annually are due to *Chlamydia*.[5]

The use of DNA amplification techniques now provides highly-sensitive and specific laboratory tests that can be performed on urine samples.[6] This has facilitated the introduction of community-wide screening programs, with some European screening prevalence studies calculating prevalence rates of 2.2–2.3 per cent in men and 1.5–2.9 per cent in women.[7] Sweden has estimated a higher rate of 6.1 per cent,[8] and the United States has reported an even higher rate of 9.2 per cent among asymptomatic female army recruits.[9]

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Under the *NSW Public Health Act 1991*, laboratories must notify NSW Health when clinical specimens test positive for *Chlamydia trachomatis*. All new laboratory notifications of *Chlamydia trachomatis* infection are entered in the NSW Notifiable Disease Database (NDD). Since 2002, the Central Sydney Public Health Unit has followed-up Chlamydia notifications for local residents (population approximately 500,000). The aims of the enhanced surveillance program were to identify groups at risk, quantify the extent of contact tracing, and assess the feasibility of the system of enhanced surveillance.

**TABLE 1**

**CASE DEMOGRAPHICS AND PRACTITIONERS' RESPONSES FOR CHLAMYDIA, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=297**

| Case Characteristics | *n* | % |
|---|---|---|
| **Sex** | | |
| Male | 153 | 52 |
| Female | 144 | 48 |
| **Aboriginal** | | |
| Yes | 3 | 1 |
| No | 294 | 99 |
| **Median age in years** | | |
| Male | 34.0 | range 18.8–69.8 |
| Female | 25.1 | range 14.6–54.8 |
| **Country of birth** | | |
| Australia | 124 | 42 |
| China | 20 | 7 |
| United Kingdom | 25 | 8 |
| New Zealand | 8 | 3 |
| Vietnam | 8 | 3 |
| Other | 48 | 16 |
| Unknown | 64 | 22 |
| **Language spoken at home** | | |
| English | 202 | 68 |
| Chinese | 19 | 6 |
| Vietnamese | 8 | 3 |
| Other | 22 | 7 |
| Unknown | 46 | 15 |
| **Occupation** | | |
| Employed | 130 | 44 |
| Unemployed | 17 | 6 |
| Student | 37 | 12 |
| Home duties | 8 | 3 |
| Unknown | 105 | 35 |
| **Site of collection** # | | |
| Urine | 176 | 59 |
| Endocervical | 81 | 27 |
| Urethra | 18 | 6 |
| Anal | 33 | 11 |
| **Reason for testing** | | |
| Symptoms–Signs | 164 | 55 |
| Screening | 74 | 25 |
| Contact tracing | 30 | 10 |
| Other | 27 | 9 |
| Unknown | 2 | 1 |
| **Contact tracing performed** | | |
| Yes | 250 | 84 |
| No | 47 | 16 |

Note: # Can have more than one specimen site for a case.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

## METHODS

The Central Sydney Public Health Unit routinely enters notifications of Chlamydia infection into the NDD. For this study, an additional electronic database was maintained to enable recording of information that could not be directly entered into the NDD. Notifications received for the same individual but from a different specimen were considered new notifications, provided there was at least a 12-week separation between times of collection.

Active follow-up was conducted of notifications (excluding neonatal infections) resulting from tests ordered on the residents of the Central Sydney Area Health Service between 1 December 2002 and 31 May 2003. Medical practitioners who had requested the Chlamydia test that resulted in the notification were asked to complete a written standardised questionnaire to provide additional information about the patient. Information was collected on their occupation, country of birth, language spoken at home, aboriginality, reason the test was ordered, the site of the body from which specimens were collected, and method of contact tracing used. Questionnaires for notifications received in the preceding week were posted out at the end of each week with a second request sent if there was no response within three weeks.

Ethics committee approval was not sought, as the collection of this information is standard public health practice for the surveillance of a notifiable disease.

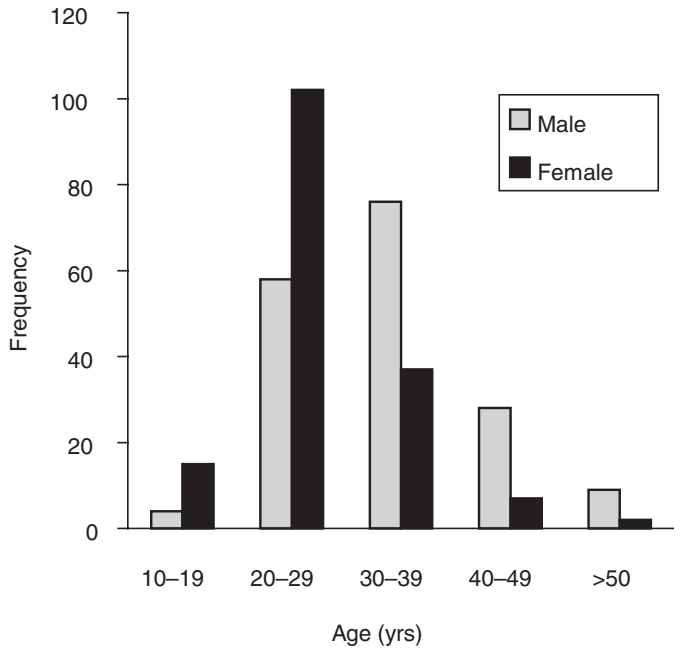
The results were analysed using the statistical software STATA,[10] to: provide descriptive information, test for an association between age and reason for the test (reason for the test was categorised into 'symptomatic', 'screening', and 'other' for this analysis), and test for an association between reason for test and whether contact tracing was performed. Chi squared and Fisher's exact tests were performed where appropriate. The Kruskal-Wallis test was used to analyse age across groups, as it was not normally distributed.

## RESULTS

Three-hundred-and-thirty-nine new notifications were recorded in NDD for the study period. There were 176 (52 per cent) males and 163 females (48 per cent) with median ages of 33.3 years and 25.1 years respectively.

**FIGURE 1**

**AGE DISTRIBUTION IN 10 YEAR BANDWIDTHS FOR MALES AND FEMALES NOTIFIED AS HAVING CHLAMYDIA, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=339**




Source: Communicable Diseases Branch, Notifiable Diseases Database (HOIST), Centre for Epidemiology and Research, NSW Department of Health.

Figure 1 presents the age of the patients grouped in 10-year age bands for males and females. There were more female than male cases in the 20–29 year age group, with the reverse being observed in the 30–39 year age group.

There were 339 questionnaires sent out with 297 responses received giving a response rate of 88 per cent. Table 1 summarises the information obtained from the responses to the questionnaires (*n*=297). The number of males and females was similar. More than half of the notifications resulted from urine specimens, twice as many as from the next most common specimen site, the endocervix. Some degree of contact tracing was reported for almost 85 per cent of notifications.

**TABLE 2**

**REASON FOR ORDERING A CHLAMYDIA TEST FOR MALES AND FEMALES, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=295[#]**

| Reason for test | Female | | Male | |
|---|---|---|---|---|
| | *n* | % | *n* | % |
| Symptomatic | 73 | 51 | 91 | 59 |
| Screening | 37 | 26 | 37 | 25 |
| Other | 32 | 23 | 25 | 16 |
| **Total** | **142** | | **153** | |

note: [#] reason for test unknown for two cases.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

Table 2 describes the reason that a Chlamydia test was ordered for males and females. A higher proportion of males were tested because of clinical symptoms in comparison to females although the presence of clinical symptoms was the most common reason for ordering a test in both groups. Considering only the female cases, the median age for women tested due to symptoms was 26.1 years (*n*=73), 25.9 years (*n*=37) for women who were diagnosed through screening, and 23.7 years (*n*=32) for women who were tested for other reasons. The Kruskal-Wallis test for equality of age ranks did not reveal a significant difference in ages between these groups ($p$=0.08, $df$=2).

Of the 250 instances where contact tracing was done, 148 were performed by the patient, 54 by the treating doctor, 35 by the Central Sydney Sexual Health Service, and 13 by other means.

**TABLE 3**

**WAS HAVING A TEST FOR CHLAMYDIA BECAUSE OF SYMPTOMS ASSOCIATED WITH CONTACT TRACING, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=295**

| Reason for test | Contact tracing performed | | No contact tracing | | *p* value |
|---|---|---|---|---|---|
| | *n* | % | *n* | % | |
| Symptoms | 135 | 82 | 29 | 18 | 0.36[a] |
| No symptoms | 113 | 86 | 18 | 14 | |

Notes: [a] chi squared.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

**TABLE 4**

**WHETHER PATIENT OR DOCTOR REQUESTED A SCREENING TEST FOR CHLAMYDIA ASSOCIATED WITH CONTACT TRACING OCCURRING, CENTRAL SYDNEY AREA HEALTH SERVICE, NSW, DECEMBER 2002 TO MAY 2003, *N*=74 [#]**

| Screening request | Contact tracing performed | | No contact tracing | | *p* value |
|---|---|---|---|---|---|
| | *n* | % | *n* | % | |
| Patient | 39 | 83 | 8 | 17 | 0.54[a] |
| Doctor | 23 | 85 | 4 | 15 | |

Notes: [a] Fisher's exact.
[#] reason for test unknown for two cases.

Source: Enhanced Chlamydia Notification Follow-up Database, Central Sydney Public Health Unit.

There was no association between having a test because of symptoms and whether contact tracing had been performed (Table 3).

For those cases that presented for screening there was no association between whether the doctor or patient initiated the screening and whether contact tracing had been performed (Table 4).

## DISCUSSION

A high response rate was achieved, using a surveillance system that was not resource intensive. The surveillance system identified an equal gender balance among individuals notified, with males being older than females. A relatively low proportion of notifications was from individuals who did not speak English at home. Some form of contact tracing had been done for the majority of cases.

As only positive tests are notified, the system's ability to provide insights into both patient and medical practitioner screening behaviour is limited. Campaigns to prevent STIs often advocate screening of groups that are at risk. When evaluating the effectiveness of a campaign, it would be more appropriate to conduct surveillance on the number of tests requested by practitioners rather than the number of notifications received by public health units.

In April 2003, the NSW Department of Health delivered a community-wide Chlamydia education campaign targeted at younger people. The period of our study overlapped this campaign and as such the findings from the later part may reflect the impact of this initiative. However, this overlap period was short.

This study identifies some opportunities to ensure public health control measures aimed at reducing genital Chlamydia infection are targeted appropriately. First, nine per cent of notifications were for females aged less than 20 years, which highlights the significance of the infection in this group. Second, there may be evidence that non-English speaking individuals are experiencing barriers to accessing medical services for STIs. The region covered by the Central Sydney Area Health Service is known to have a high proportion of residents who speak a language other than English at home (41.3 per cent).[11] However only approximately 20 per cent of cases for whom language spoken at home was identified indicated they spoke a language other than English at home. This apparent under representation may indicate that non-English speaking residents are experiencing difficulties in accessing sexual health services.

While acknowledging the limitations of a notification system to assess screening behaviour, the finding that only 25 per cent of infections in both sexes were diagnosed through screening suggests that widespread screening is not occurring. As younger women are at higher risk of contracting Chlamydia, it has been recommended that screening programs target this group.[12] If younger women were being preferentially targeted for screening it is likely that the age of women diagnosed as a result of screening would be lower than that of women diagnosed as a result of investigations of symptoms. This was not the case in our study, suggesting that the screening that is being conducted is not being targeted at the groups at highest risk.

The application of 'best practice' for STI contact tracing would initiate contact tracing for every identified case of Chlamydial infection.[13] Our finding that contact tracing did not occur for over 15 per cent of cases indicates an opportunity to improve practice. Further, as over half of the contact tracing was initiated by the patients, it is important that they are provided with advice, support

materials, and skills to ensure they have the capacity to carry out this role effectively.

Contact tracing was not associated with whether the case had symptoms, or whether the diagnosis was made as a result of screening, or who initiated screening. This would suggest that factors other than the reason why an individual has presented for a test determine whether contact tracing is performed.

## CONCLUSION

The enhanced Chlamydia surveillance system described in this article can efficiently identify at-risk groups and monitor the extent of contact tracing that is occurring. There is limited evidence of screening among at-risk groups. Some form of contact tracing is occurring for the majority of diagnosed cases. These results could be used to provide a baseline for an evaluation of the Chlamydia education campaign in the Central Sydney Area Health Service.

## REFERENCES


1. Graphical Online Data Surveillance Evaluation for Notifiable Diseases (GODSEND). Sydney: Centre for Epidemiology and Research, NSW Department of Health, 2003.
2. Grulich A, de Visser R, Smith A et al. Sexually transmissible infection and blood-born virus history in a representative sample of adults. *Aust N Z J Public Health* 2003, 27(2): 234–241.
3. World Health Organization. *Global Prevalence and Incidence of Selected Curable Sexually Transmitted Infections. Overview and Estimates*. Geneva: WHO, 2001.
4. Cates W Jr, Rolfs RT Jr, Aral SO. Sexually transmitted diseases, pelvic inflammatory disease, and infertility: an epidemiologic update. *Epidemiol Rev* 1990; 12: 199–220
5. Nelson HD, Helfand M. Screening for chlamydial infection. *Am J Prev Med* 2001; 20(3-S): 95–107
6. Black CM. Current methods of laboratory diagnosis of Chlamydia trachomatis infections. *Clin Microbiol Rev* 1997; 10: 160–84.
7. Low N and Egger M. What should we do about screening for genital Chlamydia? *Int J Epidemiol* 2002; 2002;31: 891–3
8. Swedish Institute for Infectious Disease Control. *Communicable Disease in Sweden 2000. The Annual Report of the Department of Epidemiology*. Stockholm: Smittskyddinstitutet, 2001.
9. Gaydos CA, Howell MR, Pare B et al. Chlamydia trachomatis infections in female military recruits. *N Engl J Med* 1998; 339: 739–44.
10. StataCorp. *Stata Statistical Software: Release 7.0*. College Statico,Texas: StataCorp, 2002.
11. Wen et al. *A 2001 demographic profile of the Central Sydney Area Health Service*. Sydney: Division of Population Health, Central Sydney Area Health Service, 2003.
12. Nelson HD, Helfand M. Screening for chlamydial infection. *Am J Prev Med* 2001; 20(3-S): 95–107.
13. Australasian Society for HIV Medicine. *Australasian Contact Tracing Manual: 2nd edition (revised)*. Sydney: Australasian Society for HIV Medicine, 2002.


**ERRATUM**

**VIRAL GASTROENTERITIS FACT SHEET**

The September–October 2003 issue of the *NSW Public Health Bulletin* (Volume 14, Number 9–10) contained a fact sheet for Viral Gastroenteritis. At the end of the fact sheet, readers interested in further information on suitable fluids for children with gastroenteritis were referred to the 'Gastroenteritis in Children' fact sheet on the website of the Children's Hospital at Westmead.

This fact sheet was jointly developed by the Children's Hospital at Westmead and the Sydney Children's Hospital at Randwick. The fact sheet is available from the websites of both hospitals at **www.chw.edu.au** and **www.sch.edu.au**.