

A decision to end a periodic syphilis-screening program in the Kimberley region

Donna B Mak,^{1,2} C D'Arcy J Holman²

Abstract

Syphilis rates in the Kimberley region of far-northern Western Australia are among the highest in the nation. In 1986, a formal program of periodic syphilis screening was established. Decreasing syphilis rates since the early 1990s prompted, in 1999, re-evaluation of the value of periodic screening. All confirmed cases of syphilis identified in the Kimberley between January 1996 and early December 1999 as a result of syphilis serology were classified by reason for the test and staged according to disease progression. During the study period, 196 cases of syphilis (117 male, 79 female) were diagnosed; 14 (7.1%) were primary, 32 (16.3%) secondary and 150 (76.5%) latent. The periodic screening program contributed only about 10 per cent of cases, whereas testing as a result of sexually transmitted disease symptoms, sexually transmitted disease contact, institutional screening and other screening contributed the remaining cases. In January 2000, the periodic syphilis-screening program was discontinued. The effect of this policy change will be closely monitored using indicators to ensure that, should the decision not to screen prove to have been misjudged, any increase in syphilis incidence is detected early and managed appropriately. *Commun Dis Intell* 2000;24:386-390.

Key words: syphilis, STD, screening, epidemiology, Aborigines, immigrants

Introduction

Syphilis rates in the Kimberley, a remote and sparsely populated region in far-northern Western Australia, are among the highest in the Nation.¹ A structured program of periodic syphilis screening, based on a regional population register of Aboriginal Kimberley residents, was established in 1986. It aimed to reduce the incidence of syphilis by detecting and treating prevalent cases.

The program offered annual syphilis serology (SS) testing to all Aboriginal Kimberley residents aged 15 to 40 years, and testing every second year to those aged below 40 years. In addition, syphilis testing was also recommended for all patients presenting with sexually transmitted disease (STD) symptoms, and named contacts of STD cases (at the initial consultation and 3 months later), and as part of routine antenatal screening (at booking and at 28 to 36 weeks gestation).

In 1996, following evaluation of the program and discussions with the Kimberley Aboriginal Services Council, the target group was modified to include all Kimberley residents aged 15 to 25 years. The basis for this decision has been discussed elsewhere.² In addition, rather than being centrally managed using a regional population register, the responsibility for initiating SS testing in first-time patients and for recalling patients for repeat testing was devolved to local health services. People outside the target group for whom a repeat SS had been recommended prior to the policy change were still offered the test, even if it became due after 1 January 1996. No changes were made regarding the other recommendations for SS as described above.

Setting

Aboriginal people comprise one half of the resident population of about 30,000 people scattered across the Kimberley, an area of more than 420,000 square kilometres. The age structure of the population is much younger than the State average. This reflects the demographics of Aboriginal Australia, as well as the predominance of young people who move to the Kimberley for work.

The landscape ranges from coastal sub-tropical areas to open savanna and semi-desert. Much of the terrain is rugged and accessible only by four-wheel drive vehicle or light aircraft. There are 6 major towns (with populations ranging from 2,000 to 10,000) and more than 200 discrete Aboriginal communities ranging in size from just a few families to over 500 people. Health care is provided predominantly by government and community-controlled organisations. Each of the major towns has a hospital and one or more primary-care services. Remote-area clinics staffed by nurses and Aboriginal health workers are present in fewer than 20 Aboriginal communities.

In recent years, increasing numbers of 'boat' people from Indonesia and the Middle East have entered the Kimberley illegally. On arrival, these people are taken immediately to either the regional prison or immigration detention centre, so they have very little unsupervised contact with Kimberley residents.

The unique cultural and demographic mix of the Kimberley, coupled with its geographic features and low population density, has considerable implications for communicable disease control.

1. Kimberley Public Health Unit, Derby, Western Australia

2. The University of Western Australia, Nedlands, Western Australia

Corresponding author: Dr Donna B Mak, Public Health Medical Officer, Kimberley Public Health Unit, PMB 912, Derby, WA, Australia 6728. Telephone: +61 8 9191 1144. Fax +61 8 9193 1378. E-mail: donna.mak@health.wa.gov.au

In this paper we report on SS testing activity in this region for the years 1986-1999 and discuss why periodic screening has been discontinued. Preliminary reports of parts of this work have appeared elsewhere.³

Methods

All pathology services are provided by one laboratory, which sends the pathology request form and results of SS tests done in the Kimberley to the Kimberley Public Health Unit (KPHU). With the agreement of all State government and Aboriginal community controlled health services, and private general practitioners in the region, the KPHU maintains a regional syphilis register of syphilis serology results and treatments. The first author (DM) interprets results in the light of the clinical history on the request form and the patient's previous SSs, as recorded on the register, and recommends when the next SS is due and whether any treatment is required. The annotated SS result is then sent to its health service of origin for filing in the SS recall system. Information about syphilis treatment is obtained from the patient's doctor on a case-by-case basis.

All cases of syphilis identified in the Kimberley as a result of syphilis serology taken between 1 January 1996 and 6 December 1999 inclusive, with diagnosis confirmed before 14 December 1999, were examined. Information obtained for each case from the KPHU syphilis database included the patient's age, sex, race and address, the district of their health service provider, their stage of syphilis, date of SS and date of completed treatment, and the clinical indication for SS testing.

Syphilis cases were staged according to the following criteria:

- Primary – serological evidence of syphilis infection or re-infection of less than 6 months' duration and/or clinical signs of primary syphilis, eg chancre.
- Secondary - serological evidence of syphilis infection or re-infection of 6 to 24 months' duration and/or clinical signs of secondary syphilis, eg condylomata lata, alopecia.
- Tertiary - serological evidence of syphilis infection or re-infection of greater than 24 months' duration and clinical signs of tertiary syphilis.
- Late latent - serological evidence of syphilis infection or re-infection of greater than 24 months' duration or no serological evidence that syphilis is less than 24 months' duration and no clinical signs of primary, secondary or tertiary syphilis.*

Due to the absence of information about clinical signs in many patients, an additional category of 'early syphilis, confirmed or probable' was defined. This included all cases of primary and secondary syphilis, and cases of late latent syphilis if the rapid plasma reagin test titre was greater than sixteen.

According to information on the pathology request form, clinical indications for SS testing were classified into the categories:

- STD symptoms – patient had symptoms of STD, eg urethral discharge, epididymo-orchitis, pelvic inflammatory disease, genital lesion.

- STD contact – named contact of a patient with STD.
- Antenatal – routine SS during pregnancy.
- Institutional screening – routine SS on admission to prison or detention centre.
- Periodic screening – SS done as part of the periodic screening program.
- Other screening – SS done in other clinical contexts, eg well person's check-up, diabetes/chronic disease review, asymptomatic patient requests STD screen.

In accordance with ethical requirements, access to the data was restricted to the person responsible for generating the data in the course of re-evaluating the screening program (the first author, DM). The confidentiality of study subjects was thus preserved at all times.

Results

SS testing activity increased after implementation of periodic screening in 1986 (Figure 1). After the program was modified in 1996, testing activity decreased initially but by 1999 had returned almost to pre-1996 levels.

Figure 1. Number of syphilis serology tests done in the Kimberley, by year*



* 1991-94 data are missing because these data were collected manually and are no longer accessible.

As part of a regional evaluation of the quality of STD management, syphilis-screening coverage of a random sample of 384 Aboriginal people aged 15 to 25 years was examined in 1998. This showed that only 21 per cent had been tested for syphilis within the past year, 29 per cent within the past 2 years and 45 per cent at any time in the past, leaving 55 per cent who had never been tested. An audit of the SS recall systems in 8 Community Health and remote area clinics showed that 18 per cent of patients within the system were 1 month overdue for their SS, 14 per cent were 2 to 3 months overdue and 41 per cent were over 3 months overdue. The largest proportion of overdue tests (43%) was from patients overdue for periodic screening (Figure 2).

The stability of syphilis incidence rates over the 5 years to 1999 and the consistent drop in the incidence of early syphilis over the last 4 of these years (Kimberley Public

* There was no early latent category because the limited clinical information obtained from pathology request forms does not allow accurate differentiation of early latent and secondary syphilis. It is likely that some cases classified as secondary syphilis, were in fact, early latent.

Figure 2. Distribution of overdue syphilis serology tests in the Kimberley, 1 January 1996 to 6 December 1999, by indication for test

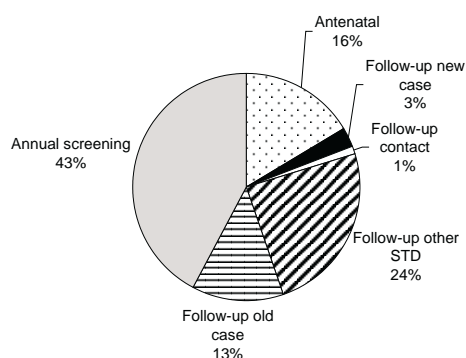


Figure 3. Kimberley syphilis rates per 1,000 person years, 1986 to 1998

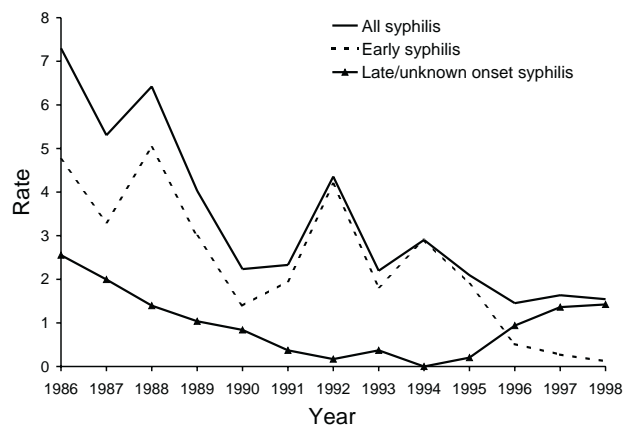


Table 1. Demographic characteristics of syphilis cases in the Kimberley, 1 January 1996 to 6 December 1999, by clinical stage*

| | All cases ^a | | Primary and secondary ^b | | Early syphilis, confirmed or probable ^c | | Late latent ^d | |
|------------------------|------------------------|------|------------------------------------|------|--|------|--------------------------|------|
| Male: female | 117:79 | | 21:25 | | 29:30 | | 96:54 | |
| Age (years) | | | | | | | | |
| Range | 10-67 | | 15-46 | | 15-48 | | 10-67 | |
| Median | 30 | | 25 | | 25 | | 32 | |
| Race | n | % | n | % | n | % | n | % |
| Aboriginal | 154 | 78.6 | 44 | 95.7 | 55 | 93.2 | 111 | 73.3 |
| Indonesian/Middle East | 26 | 13.4 | 0 | 0.0 | 2 | 3.4 | 26 | 17.3 |
| Other non-Aboriginal | 16 | 8.2 | 2 | 3.4 | 2 | 3.4 | 14 | 9.3 |
| NT residents | 23 | 11.7 | 4 | 8.7 | 7 | 11.9 | 19 | 12.7 |

* a = b + d ; c = b + some cases from d

Health Unit, unpublished data; Figure 3) prompted, in December 1999, re-evaluation of the merit of periodic screening.³

During the study period, 196 cases of syphilis (117 male, 79 female) were diagnosed; 14 (7.1%) were primary, 32 (16.3%) secondary and 150 (76.5%) late latent cases. Early syphilis, confirmed or probable, accounted for 59 (30.1%) of cases. Cases of late latent syphilis were more likely to be male, older and of overseas origin (Table 1). Health services in Broome, Fitzroy Crossing and Halls Creek districts contributed the majority of cases (Table 2).

As syphilis rates in the Northern Territory (NT) districts that border the Kimberley are up to twice the Kimberley rates, it was noted that NT residents accounted for around 10 per cent of cases.⁴ An increasing number and proportion of cases were of overseas origin (Figure 4). Almost all of these were inactive, non-infectious cases.

Periodic screening contributed to only about 10 per cent of syphilis cases, whereas SS testing as a result of STD

Table 2. Distribution of syphilis cases in the Kimberley, 1 January 1996 to 6 December 1999, by district of health service provider

| District | n | % |
|------------------|-----|-------|
| Broome | 57 | 29.1 |
| Derby | 27 | 13.8 |
| Fitzroy Crossing | 39 | 19.9 |
| Halls Creek | 39 | 19.9 |
| Wyndham | 12 | 6.1 |
| Kununurra | 22 | 11.2 |
| Total | 196 | 100.0 |

symptoms, STD contact, institutional screening and other screening contributed to much larger proportions of cases (Figures 5 and 6).

Figure 4. Syphilis cases in the Kimberley, 1 January 1996 to 6 December 1999, by race and year

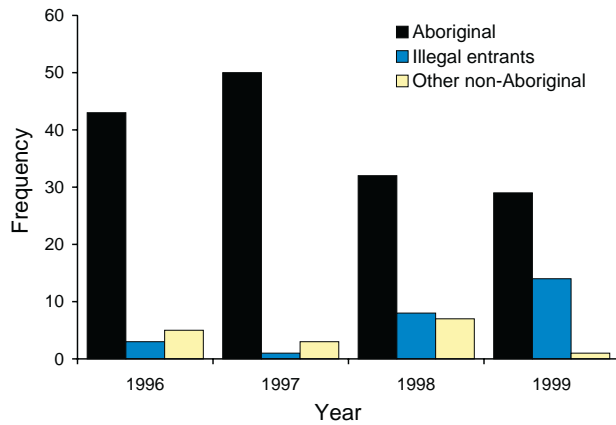
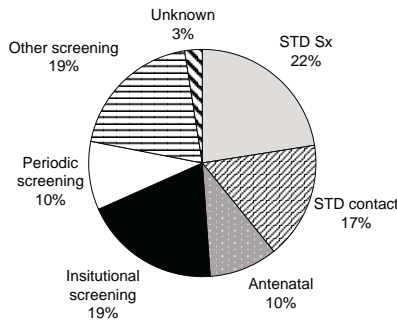
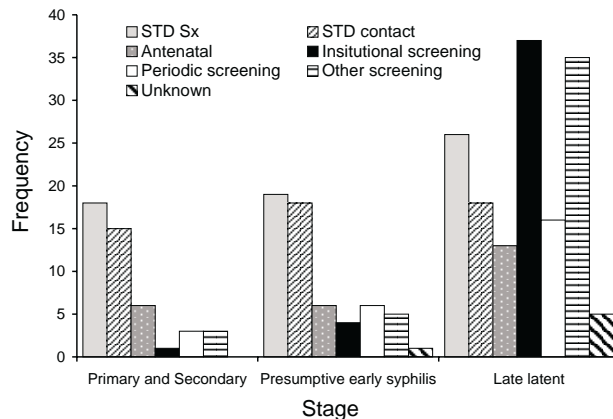


Figure 5. Clinical indication for syphilis testing, n = 196



Sx = symptoms

Figure 6. Clinical indication for syphilis testing by stage of syphilis



Sx = symptoms

Discussion

Syphilis represents a STD control success story in the Kimberley. The syphilis incidence rate has decreased 10-fold since the mid-1980s and the proportion of cases transmitted locally is decreasing. Declining yields by age group could not be determined, as data on testing activity are incomplete (Figure 1). The decrease in SS testing activity between 1990 and 1995-7 was probably due to a combination of factors including decreased syphilis incidence (and therefore fewer post-treatment SSs being done), changes in the organisational management of some health services resulting in STD control being lower on their list of priorities, and the increasing movement of Aboriginal people to out-stations without a commensurate reorganisation of health resources.

In January 2000, the periodic syphilis-screening program was discontinued because it had contributed to only 10 per cent of cases detected during the recent period. This could be, at least in part, due to the fact that too few tests are done for periodic screening. KPHU does not have sufficient data on the proportion of cases detected in this way in the past to prove or disprove this suggestion. However, as KPHU receives approximately 1,000 STD notifications each year - and there are approximately 700 births in the Kimberley each year (with each STD or birth generating two SS tests ideally) - it is probably reasonable to assume that at least 1,000 to 2,000 SSs each year are done for periodic or other screening unrelated to STDs and pregnancy. Thus, in absolute terms the number of SSs done for periodic screening is quite large, even though screening of those 15 to 25 years old is incomplete.

It might be argued that an increasing incidence of late/unknown-onset syphilis coupled with a decreasing incidence of early syphilis, as observed since 1995 (Figure 3), indicates delay in the detection and management of syphilis cases. However, closer scrutiny of the late/unknown-onset cases detected since 1995 showed that the vast majority were middle-aged or elderly people who had been seropositive (negative or low titre RPR and positive TPHA) for a decade or more but had no documentation of having had a definitive syphilis treatment. Some of these people may have been treated for syphilis but without adequate documentation. Others may have been seropositive due to yaws.^{6,7,8} Probably only a small proportion had untreated late latent syphilis, but it was decided to err on the side of caution and offer these patients a definitive treatment for late latent syphilis.

Further evidence against a delay in the detection and management of syphilis cases comes from the fact that, in contrast to some other areas of rural Australia, there have been no reports of congenital syphilis in the Kimberley since 1989.^{5,9,10}

In 1996 azithromycin (1.0 g to cover chlamydia) was introduced as one component of the standard epidemiological treatment (with amoxicillin and probenecid) for uncomplicated urethritis/cervicitis in the Kimberley and neighbouring areas of northern Australia. This is a possible reason for the observed decrease in early syphilis rates in the Kimberley. While azithromycin is not a recognised syphilis treatment, a single dose of one gram has been shown to be efficacious for prevention of syphilis in people exposed to infected sexual partners.¹¹

The authors are aware of recent initiatives in STD control in Central Australia where, in addition to targeted STD-screening in known high-risk groups, mass screening for gonorrhoea and chlamydia, and opportunistic screening for syphilis, are currently recommended.¹² The Kimberley situation is quite different from that of central Australia. Organised syphilis screening, STD contact tracing, STD notification and a regional syphilis register were established over 15 years ago in the Kimberley, whereas a similar level of health service infrastructure in central Australia was established in much more recent times. This is why the Kimberley is stopping one specific syphilis-screening strategy, whereas other areas in Australia are increasing syphilis-screening activity.

To ensure that stopping the periodic syphilis-screening program does not result in increased syphilis transmission, KPHU will be encouraging local health services to redirect resources previously devoted to periodic syphilis screening into more effective strategies to diagnose and control transmission of the disease. For example, ensuring that all patients with STD symptoms and STD contacts have syphilis testing both at presentation (currently not well done) and 3 months later, and more timely administration of syphilis treatment for infectious patients.^{3,13}

In addition, KPHU will be monitoring the effects of the new policy on the number of syphilis tests done each month, and health services will be asked to audit their SS recall systems in late 2000 to ensure that the proportion of overdue serology tests has decreased. Should the decision not to screen prove to have been misjudged, existing Kimberley policies of syphilis screening for all antenatal women and newborns (cord blood SS) and prison inmates will provide sentinel populations for detecting any increase in syphilis incidence.

Acknowledgments

Thank you to Ruth Southern and Maree Hose (Public Health Nurses) for maintaining the register without which this work

would have been impossible. Many thanks to all health staff in the Kimberley who contributed towards the periodic syphilis-screening program during its lifetime, 1986-99.

References

1. Thompson J, Lin M, Halliday L, Preston G, McIntyre P, Gidding H et al. Australia's notifiable disease status, 1998. *Commun Dis Intell* 1999;23:277-304.
2. Mak DB, Holman CD. Age at first episode of venereal syphilis in an Aboriginal population: an application of survival analysis. *Aust N Z J Public Health*, 1998; 22:704-708.
3. Mak DB. Rethinking the need for periodic syphilis serology testing. *Kimberley Public Health Bulletin* February 2000:8-11.
4. NT notifications of diseases by districts 1997 and 1996. *The Northern Territory Disease Control Bulletin* 1998; 5. <http://www.nt.gov.au/nths/public/cdc/vol5/notifications>.
5. Mak D, Platt E, Marshall L. Gonorrhoea and syphilis in the Kimberley region. *Aust N Z J Public Health*, 1998;22:167-169.
6. Jacobs DS. Syphilis in Australian Aborigines in the Northern Territory. *Med J Aust* 1978; 1:10-12.
7. Jacobs DS. A syphilis epidemic in a Northern Territory Aboriginal community. *Med J Aust* 1981;1(2 Suppl):5-8.
8. Garner MF, Backhouse JL, Moodie PM, Tibbs GJ. Treponemal infection in the Australian Northern Territory aborigines. *Bull World Health Organ* 1972;46:285-293.
9. How JH, Bowditch JD. Syphilis in pregnancy: experience from a rural aboriginal community. *Aust N Z J Obstet Gynaecol* 1994; 34:383-389.
10. Humphrey MD. Syphilis: alive and well as a cause of perinatal death. *Med J Aust* 1996;164:381-382.
11. Hook EW 3rd, Stephens J, Ennis DM. Azithromycin compared with penicillin G benzathine for treatment of incubating syphilis. *Ann Intern Med* 1999;131:434-437.
12. Office of Aboriginal and Torres Strait Islander Health. STD control in remote Aboriginal communities. A manual for clinic workers. Canberra: Commonwealth Department of Health and Aged Care, 1999.
13. Mak DB, Holman CDJ. STDs aren't sexy: Health professionals' lack of adherence to clinical guidelines in an area of high STD endemicity. *J Public Health Med*, in press.