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TUBERCULOSIS CONTROL: THE CHALLENGE CONTINUES

GUEST EDITORIAL

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Not very long ago in the history of public health in NSW tuberculosis was a major killer. In 1935 the NSW Department of Public Health recorded 1,572 cases of pulmonary tuberculosis, including 939 deaths – rates of 59/100,000 and 35/100,000 respectively. After World War II the development of effective therapy, contact tracing, screening, and a strong network of chest clinics throughout the State led to the control of TB and a dramatic decline in incidence. Today NSW has one of the lowest rates of TB in the world; there were 260 notifications of pulmonary tuberculosis in 1995[1] (a rate of 4.2/100,000) in NSW, and around 0.5 deaths per 100,000 in Australia as a whole[2].

These rates could be lower, however, and the prevention and control of TB continues to be a high priority in NSW. Tuberculosis Coordinators in each of the State's 17 Area Health Services are responsible for coordinating TB surveillance, treatment, case investigation, contact screening and preventive therapy, which are carried out by nursing staff and physicians in a network of chest clinics. These clinics rely heavily on the expertise of local and referral laboratory services, and the cooperation of family doctors in referring patients and facilitating ongoing care. At the State level, the Tuberculosis Advisory Committee (TBAC), the membership of which includes physicians, nurses and epidemiologists, makes policy recommendations, drawing on data collected in the field by chest clinic staff, the medical literature and overseas guidelines. Recent issues considered by TBAC have included control of TB in prisons, prevention of the spread of TB from infectious passengers on airline flights, the use of prophylactic rifabutin, supply of drugs for TB management, new technologies for drug testing, use of BCG vaccine among health care workers, screening of refugees for TB, and improved TB surveillance. These and other emerging issues, such as tuberculosis-HIV co-infection, and multi-drug-resistant organisms, present continuing challenges.

In this issue of the *Public Health Bulletin*, we examine the epidemiology of tuberculosis in NSW in 1995 with Heath et al; hear from an old friend, Dr Michael Levy (the Department's former specialist medical adviser on infectious diseases, now with the World Health Organization); get an update on an investigation from Conaty et al about the emerging risk of tuberculosis in prisons; and have a round-up of TB control activities in recent years from the Public Health Network. As these articles highlight, continued vigilance is essential for sustained TB control. Tuberculosis is a disease with a long history, and it has very real implications for today.

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1. Heath T, Winks M, Roberts C, Capon A. Tuberculosis in NSW: Status and priorities. *NSW Public Health Bulletin* 1996;7(11):135-137.
2. Oliver G. Tuberculosis notifications in Australia, 1994. *Comm Dis Intell* 1996; 20:108-115.

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PUBLIC HEALTH NETWORK REPORT: TUBERCULOSIS

PUBLICATIONS AND REPORTS

Title: **The prevalence of tuberculosis infection in New South Wales police recruits 1987-1990**

Authors: Coolahan L, Levy M

Publication: *Med J Aust* 1993; 159;369-372

Contact: SE PHU

Title: **Control and elimination of tuberculosis in Australia**

Authors: Stewart G, Smith M

Publication: *Med J Aust* 1995; 163:50 (Letter)

Contact: SWS PHU

Title: **The prevalence of tuberculosis infection in New South Wales police recruits, 1987-1990**

Author: Stewart GS

Publication: *Med J Aust* 1993; 159:840 (Letter)

Contact: SWS PHU

Title: **Tuberculosis screening in inmates and staff of a NSW jail**

Authors: Sladden T, O'Donnell J, Levy M

Publication: *NSW Public Health Bulletin* 1995; 6:19-20

Contact: NC PHU

Title: **The prevalence of tuberculosis infection among Year 8 school children in inner Sydney in 1992**

Authors: Alperstein G, Fett MJ, Reznik R, Thomas M, Senthil M

Publication: *Med J Aust* 1994; 160:197-201

Contact: Central Sydney AHS

Title: **Surveillance for tuberculosis among residents of hostels for homeless men**

Authors: Lau E, Ferson MJ

Publication: *Aust NZ J Public Health* 1997 (in press)

Contact: SES PHU

PUBLIC HEALTH PROGRAMS AND RESEARCH

Title: **Prevalence of tuberculosis infection among Year 8 children in Central and Southern Sydney** (completed)

Contact: Central Sydney AHS

Title: **Prevalence of tuberculosis infection in Year 1 children in Central, Southern and South-western Sydney** (completed)

Contact: Central Sydney AHS

Title: **Epidemiology of tuberculosis in NSW** (completed)

Contact: SWS PHU

Title: **Evaluation of tuberculosis program outcome indicators in South Western Sydney. Evaluation of targeted intervention to minimise the delay in diagnosis of tuberculosis** (completed)

Contact: SWS PHU

Title: **Contact tracing – how effective is it?** (completed)

Contact: SES PHU and Respiratory Medicine, Prince of Wales Hospital

Title: **Strategic plan for tuberculosis in the NSAHS** (in progress)

Contact: NS PHU

Title: **Tuberculosis screening in a juvenile detention centre on the Central Coast** (in progress)

Contact: CC PHU and Gosford Chest Clinic

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The *Bulletin* aims to provide its readers with population health data and information to motivate effective public health action. Articles, news and comments should be 1,000 words or less in length and include a summary of the key points to be made in the first paragraph. References should be set out using the Vancouver style, the full text of which can be found in *British Medical Journal* 1988; 296:401-5.

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TUBERCULOSIS IN 1996: A VIEW FROM GENEVA

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Tuberculosis has received renewed attention during the past five years, both as the focus of public health policy and from clinical perspectives. This article outlines global priorities for TB control, identifies the implications for Australia, and acknowledges recent Australian developments in TB control, both at home and more widely in the Asia-Pacific region.

MAJOR GLOBAL PRIORITIES

In 1993 the World Health Organization (WHO) called on health planners throughout the world to recognise TB as a *global emergency*.

The highest priority for global TB control is to persuade health authorities throughout the world to take a systematic approach to the TB problem. This requires a commitment by governments to the allocation of resources for drug supplies, and to the introduction of information systems for monitoring treatment outcomes. Above all, *directly observed treatment, short-course* (known as DOTS) must be widely accepted and implemented.

There are major barriers to the achievement of global TB control:

- Population-based estimates of the acceptance of DOTS vary from 10 to 30 per cent – too low to prevent emergence of drug-resistant TB.
- The development of new anti-tuberculosis measures which are cheap enough for resource-poor countries appears to be an unlikely prospect.
- In many countries clinicians fail to make use of existing diagnostic methods, and fail to differentiate infectious cases from non-infectious cases.
- In many parts of the world poor treatment leads to chronic disease.
- The need for expertise in TB control far outstrips the availability of qualified personnel.

IMPLICATIONS FOR AUSTRALIA

While Australia has a low incidence of TB, global population mobility poses a continuing risk for the importation of TB from countries with higher incidence (i.e. most of the rest of the world). It is therefore essential for Australia to have a TB control program which provides a basis for managing this risk.

Many of the principles of TB control are the same for high-incidence and low-incidence countries. The essential components of TB control programs are:

- accurate diagnosis of TB cases;
- effective treatment; and
- evaluation of TB control programs.

Diagnosis

Sputum microscopy remains the best test for determining whether individual cases pose a public health risk for the spread of disease to others, and for deciding whether efforts should be made to trace contacts. Sputum culture and sensitivity testing are the appropriate investigations for patient management and program monitoring.

Treatment

All treatment – every dose during the first two months of treatment – must be fully supervised. This is the basis of directly observed therapy. Cases must be followed through to the end of treatment, assessed and categorised according to treatment outcome.

The global target is to cure 85 per cent of identified cases. Australia should be able to achieve this target, but treatment outcome information is not reported.

Evaluation

In addition to monitoring treatment outcome, surveillance of drug-resistance patterns of TB bacilli is an important method of monitoring TB control activities. Evaluation of TB control should pay specific attention to communities which are at high risk of transmission, such as the prison population. Timely monitoring of TB notifications is essential. Reporting to the WHO provides a mechanism for Australia to gauge its performance in TB control against that of other countries. This is important if Australia is to maintain its pre-eminent position in TB control among all the nations of the world. Australian surveillance on TB is reported to the WHO by the Commonwealth Department of Health and Family Services.

HISTORY OF AUSTRALIAN TB CONTROL PROGRAMS

Historically, TB control has been the responsibility of the Commonwealth. In 1976 public health aspects of TB became a State/Territory responsibility. From 1976 to 1991, ad hoc meetings of individuals identified as 'State Tuberculosis Directors' were held to coordinate national TB control efforts, but it was only when the National Health and Medical Research Council (NHMRC) convened a working party in 1992 that TB control was once more formally acknowledged as an issue of national significance.

During the years 1976-1991, the predominant concerns of 'State Directors' was the issue of pre- and post-migrant screening. This recognised that the burden of TB in Australia was due to infection acquired overseas; Australian residents born overseas have a notification rate 20 times that of people born in Australia[1].

RECENT DEVELOPMENTS

Since 1992 a wide range of TB control activities has been developed in Australia, supported by Commonwealth and State/Territory health departments, non-government organisations and the professions.

The most important has been the development of guidelines. Several States and Territories have produced guidelines for TB control and the diagnosis and management of TB cases. The NSW Health Department has issued a second edition of the publication, *Controlling Tuberculosis in New South Wales*[1], and the Victorian and Northern Territory health departments have published similar guidelines[2]. The NHMRC is expected to release national guidelines in 1997.

While the Commonwealth, State and Territory health departments have responsibility for TB control, Australia has a long and proud tradition of participation by non-government organisations in important activities which support the control of TB. Over the past 10 years the Community Health and Anti-tuberculosis Association

TUBERCULOSIS IN NSW: STATUS AND PRIORITIES

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This article provides a profile of tuberculosis occurrence in NSW, based on an analysis of surveillance data for 1995.

TB has re-emerged globally as a major threat to human health. It now causes more deaths worldwide than any other infectious disease, and is responsible for a quarter of preventable adult deaths worldwide[1,2]. Abetted by HIV/AIDS, the brunt of TB disease is borne by the developing world[3]. However, the USA, the UK and several European countries have also encountered increasing rates of active TB[4]. Outbreaks of multi-drug-resistant TB in urban and hospital settings in the USA have posed the additional threat of untreatable disease[5]. While TB rates in NSW (as in most other Australian States) have remained among the world's lowest, there is no room for complacency.

METHODS

NSW TB notification data for 1995 were obtained from the NSW Health Department's Infectious Diseases Surveillance System (IDSS) database for notifiable infectious diseases. Australian Bureau of Statistics (ABS) 1991 census data were used to calculate disease rates by country of birth and Aboriginality. All other rates were calculated using ABS estimated mid-year populations.

Definitions

In NSW, the surveillance definition of active TB (for notification purposes) is:

- signs and symptoms compatible with pulmonary TB, and an abnormal, unstable chest x-ray, (i.e. one which suggests disease progression); OR
- signs and symptoms compatible with extrapulmonary TB; OR
- evidence of disease where treatment with two or more anti-TB drugs have been prescribed; OR
- isolation of *Mycobacterium tuberculosis* complex organisms from a clinical specimen; OR
- demonstration of acid fast bacilli (AFB) in a clinical specimen from a person with signs and symptoms compatible with pulmonary TB.

A ***new case*** of active TB is an individual who has not previously received anti-TB chemotherapy for more than one month. A ***reactivated case*** is one where active TB has recurred more than one year after completion of therapy for proven disease.

Treatment default is defined as interruption of treatment for more than two months, after completing the first month of chemotherapy.

TABLE 1

TUBERCULOSIS NOTIFICATIONS BY SITE OF DISEASE, NSW, 1995

Site of disease		No of cases	%
Pulmonary	Respiratory	240	(52)
	Primary	20	(4)
Extrapulmonary	Genito-urinary	22	(5)
	Bone/joint	20	(4)
	Gastrointestinal	9	(2)
	CNS/meningitis	4	(1)
	Miliary	4	(1)
	Other (incl. lymphatic)	119	(26)
Not specified		24	(5)
Total		462	(100)

RESULTS

Disease classification and site

By August 1996, 462 cases of active TB had been reported in NSW with onset in 1995 (7.5/100,000 population). Of these, 334 notifications (72 per cent) were new cases, 34 (7 per cent) were reactivated cases, and for 95 (21 per cent) a case classification was not specified. The principal anatomical site of disease was extrapulmonary for 178 notifications (38 per cent) (Table 1).

Continued on page 136 ▶

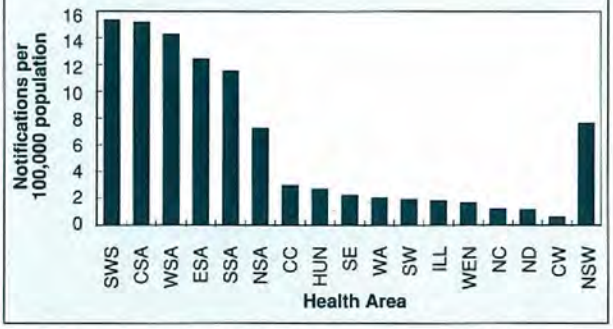
(CHATA) has supported TB-related research in Australia (through the Harry Windsor Scholarship scheme) and TB control activities in Asia – particularly Vietnam. The Public Health Association of Australia convened the National Tuberculosis Conference in November 1994 and is planning a second meeting during 1997.

CHATA's support of TB control activities in Asia is part of Australia's increasing recognition of its regional responsibilities in TB control. Since 1995, the Australian Government, through the Australian Agency for International Development, has supported TB control efforts in Indonesia and throughout the Pacific region under the World Health Organization's Global Tuberculosis Program. Australian-trained public health professionals are guiding TB control activities in Indonesia, China and Mongolia. Australians have been prominent in working with refugees in Hong Kong and Vietnam; guidelines for control of TB among refugees and displaced persons are being devised through the Macfarlane Burnet Centre for International Health; and economic analyses of TB control activities in China are being undertaken through the National Centre for Epidemiology and Population Health at the Australian National University in Canberra. Australian laboratories are participating in a global network for the monitoring of *Mycobacterium tuberculosis* drug resistance.

1. Dwyer B. What we should be doing about tuberculosis in Australia. *Med J Aust* 1996; 164:62-63.
2. Gilbert GL. Multi-drug-resistant tuberculosis: prevention is better than cure. *Med J Aust* 1996; 164:121-124.
3. Hargraves J. Tuberculosis notifications in Australia, 1993. *Commun Dis Intell* 1995; 19:334-343.

FIGURE 1

TUBERCULOSIS NOTIFICATION RATES BY REGION, NSW, 1995



CSA = Central Sydney Area; ESA = Eastern Sydney Area; SWS = South Western Sydney; SSA = Southern Sydney; WSA = Western Sydney Area; NSA = Northern Sydney Area; ILL = Illawarra; ND = Northern Districts; HUN = Hunter; SW = South Western; North Coast; WEN = Wentworth; CC = Central Coast; WA = Western Area; SE = South Eastern; CW = Central West; NSW = New South Wales.

FIGURE 2

TUBERCULOSIS NOTIFICATION RATES BY AGE AND SEX, NSW, 1995

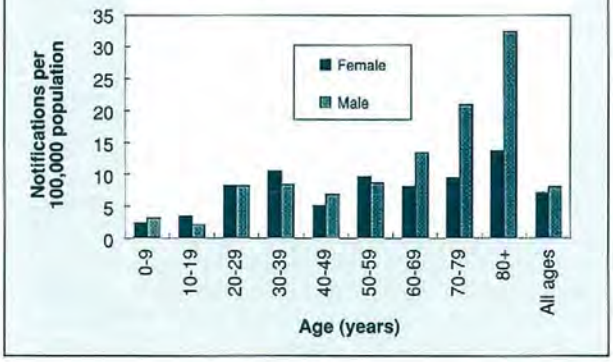
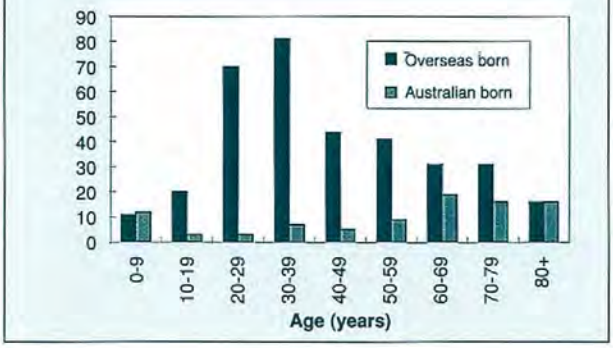


FIGURE 3

TUBERCULOSIS NOTIFICATIONS BY AGE AND PLACE OF BIRTH, NSW, 1995



Tuberculosis in NSW

► *Continued from page 135*

Infectivity and drug resistance

A sputum or bronchoscopic microscopy result was reported for 178 of the 260 pulmonary cases (68 per cent), and of these 97 (54 per cent) were positive for AFB on direct smear. Sputum from 85 pulmonary cases was direct smear positive on at least one occasion. A culture result was reported for 324 of all TB notifications (70 per cent), and 243 of these (75 per cent) were culture positive – 241 for *M. tuberculosis*, and two for *M. bovis*.

Fourteen isolates (6 per cent of culture positive notifications) were reported as isoniazid-resistant. Three isolates were resistant to pyrazinamide, including two *M. bovis* isolates which are intrinsically resistant to pyrazinamide. Only one isolate was resistant to both isoniazid and rifampicin.

Demographic characteristics of people notified with TB

TB notification rates were much higher in the Sydney metropolitan area than in rural NSW (Figure 1). Notification rates were highest among the elderly, but a smaller peak occurred in the 20-40 year age range (Figure 2). The peak in young adults largely represented overseas-born cases (median age 38 years), while most Australian-born cases notified were in older age groups (median 65 years) (Figure 3). The sex distribution for TB notifications was approximately equal (male:female = 1.1:1.0).

Country of birth was reported for 435 TB notifications in NSW (94 per cent), and of these 345 (79 per cent) were of people born overseas. The notification rate for the overseas-born population in NSW was thus 26.3/100,000, compared to 2.1 notifications per 100,000 Australian-born people, and 4.3/100,000 Aboriginal and Torres Strait Island people. Language spoken at home was recorded for 420 people and 53 per cent of these were from a non-English speaking background. Time since arrival in Australia was reported for 285 overseas-born cases (83 per cent), and of these more than 80 per cent were notified more than 2½ years after immigration (median six years; range one month to 46 years).

HIV-TB

HIV status was reported for 25 TB notifications (5 per cent of the total). Six were HIV seropositive, and two of these were Australian-born. All the *M. tuberculosis* isolates cultured from people with HIV-TB co-infection were fully drug-susceptible.

Discussion

During the past 10 years, the annual number of TB notifications in NSW has increased steadily by more than half to 462 cases, from 290 cases in 1986[6]. The factors underlying this increase are complex. They reflect changes in population structure, including age structure, and infection acquired in high-prevalence countries. This has resulted in increased demands on available TB services, particularly in metropolitan Sydney where most TB notifications occur.

In NSW, TB is predominantly an imported disease, and consequently TB services must serve a wide spectrum of non-English speaking backgrounds and cultural beliefs. This places demands on available services, because

culturally appropriate explanation and language services are essential if optimal compliance with TB treatment and screening is to be achieved.

So far, TB notification rates for Australian-born residents in NSW have remained very low, suggesting either that transmission is not occurring between immigrant and Australian-born populations, or that transmission has not yet expressed itself as active disease. A recent cross-sectional Mantoux survey of children at school entry in Central, Southern and South Western Sydney found that 2.8 per cent of Australian-born children were Mantoux positive (diameter of induration ≥10 mm) compared with 17.8 per cent of overseas born children. Mantoux positivity was much lower among Australian-born children whose parents were born overseas (3.0 per cent) than for overseas-born children[7]. Of Australian-born children whose parents were also born in Australia, 2.1 per cent were Mantoux positive.

A previous survey in the same region found that 2 per cent of year 8 Australian-born school children were Mantoux positive, similar to that found in the school entry study[8]. Thus children are at greater risk of TB infection if they were born overseas than if they were born to immigrant families in Australia. It also appears that relatively little TB transmission is occurring between overseas-born and Australian-born school children, perhaps because children with active TB are not usually contagious. Less is known about the extent of TB transmission between immigrant and Australian-born adult populations in NSW.

Drug resistance has not yet emerged as a major problem in NSW. One of the important measures designed to prevent drug resistance is directly observed therapy (DOT). To maintain drug susceptibility, resources must be made available for DOT, and DOT programs must be implemented effectively.

Although case finding and DOT are the first priorities for TB control, screening high-risk groups is also important in populations with low TB endemicity such as the NSW population[9]. The most important screening programs are contact tracing and immigrant screening, but enhanced surveillance is needed for other groups at high risk for TB. Information on these groups is sub-optimal. They include people living with HIV-AIDS, injecting drug users, the homeless, prison inmates, others living in institutions on a long-term basis, hospitalised patients and health care workers. Prompt notification and contact tracing in these settings is critical, because these groups are particularly prone to clusters of TB disease.

Preventive therapy (chemoprophylaxis) can greatly reduce the incidence of active disease in TB-infected people, and consequently it is an important component of TB screening[10]. With immigrant screening, a minority of those screened develop active disease during the 2½-year observation period following arrival in Australia. Therefore this observation period is unlikely to contribute greatly to TB case finding and prevention, unless preventive therapy is also promoted as an integral part of immigrant screening.

Further analysis of surveillance data is required to determine the relative contributions of the factors underlying the observed increase in TB notifications over the past decade. There are more cases of TB in NSW than in any other Australian State, so our approach to TB surveillance and control will be pivotal to the Australian response[11].

ACKNOWLEDGMENTS

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TUBERCULOSIS IN NSW CORRECTIONAL CENTRES: DISEASE CONTROL MEASURES FOLLOWING INFECTIOUS CASES

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This article is a preliminary report on tuberculosis control measures carried out in two of the largest correctional centres in NSW, following four laboratory-confirmed cases diagnosed among inmates between January and April 1996. Two of the cases were assessed as having been infectious.

The Corrections Health Service, with the State Tuberculosis Coordinator (from the NSW Health Department's AIDS/Infectious Diseases Branch) and the South Eastern Public Health Unit, initiated contact tracing of almost 1,000 inmates and several hundred correctional centre personnel who had been in contact with the two infectious cases.

Contact tracing did not identify any new TB cases, but a high rate of TB infection among inmates was found. An epidemiological investigation into the relationship between the cases and risk factors for transmission is to follow.

CASES

The four cases, all males, ranged in age from 26 to 43 years. All were overseas born; three had lived in Australia for more than 10 years, while the fourth had arrived two years previously.

- Case 1 was diagnosed with TB in January 1996, six months into his sentence. He had a history of periodic shortness of breath, and a chest x-ray in October 1995 showed left upper lobe changes. Direct sputum smear was negative for acid-fast bacilli, and a smear of bronchial washings was also negative, but culture of the bronchial washings was positive.
- Case 2 was also diagnosed in January 1996, one month into his sentence. He had a two-month history of weight loss, fever, night sweats and cough. Chest x-ray suggested predominantly pleural disease. One out of six sputum smears was positive for acid-fast bacilli which were present in low numbers.
- Case 3 was diagnosed in February 1996, six months into his sentence, after a prolonged history of cough. Chest x-ray showed bilateral upper lobe active changes. Direct sputum smear was positive for acid-fast bacilli.
- Case 4 was diagnosed in April 1996, 18 months into his sentence, after a six-month history of sore throat, cervical lymphadenopathy, weight loss and cough. Chest x-ray showed an active lesion in the right upper lobe, and a miliary pattern throughout the lung fields. Direct sputum smear was positive for acid-fast bacilli.

Cases 1 and 2 were considerd to be of low infectivity, but Cases 3 and 4 were considered to be infectious. Case 3 was presumed to have been infectious for three months, and Case 4 for six months, before diagnosis.

METHODS

Mantoux screening of contacts of Cases 3 and 4 was begun in March and May 1996 respectively. Contacts were defined broadly, and included all cell-mate (sharing a prison cell with an infectious case), wing-mate (in a cell sharing a prison wing with an infectious case), education and workplace contacts during the infectious period. Prison authorities compiled lists of contacts.

Corrections Health clinic staff and local chest clinic staff administered and read Mantoux tests at 72 hours. The criteria for Mantoux test positivity were defined as follows:

- ≥5mm for cell-mate contact or contacts who were HIV-positive;
- ≥10mm in the absence of a history or evidence of the contact having received BCG vaccination in the previous 10 years; and
- ≥15mm if there was a history and evidence of the contact having received BCG in the previous 10 years.

Known HIV-positive contacts were also evaluated for false-negative Mantoux because of skin-test anergy by the cell-mediated immunity multi-skin test.

Countries of birth, previous BCG, presence of BCG scar, and history of TB, were recorded at the time of Mantoux testing.

A second round of Mantoux screening was offered to Mantoux-negative inmate contacts to detect Mantoux conversions in September 1996.

Mantoux-positive inmates from first and second rounds of testing were offered chest x-rays, as were cell-mate contact and known HIV-positive inmates. In both correctional centres mobile chest x-rays were made available for inmates. Staff with positive Mantoux reactions were referred to chest clinics in the community. Inmates' chest x-rays were forwarded to the major administrative correctional centre in the State, where they were reviewed by a single chest physician with expertise in TB, with the historical information collected at the time of Mantoux screening. Inmates with normal chest x-rays were either allocated to six months of isoniazid prophylaxis, or allocated to have two years of follow-up with chest x-rays. Prison medical officers made the final decision on clinical review. Baseline biochemical evidence of hepatitis (serum transaminases or bilirubin at least twice the upper limit of normal), clinical or biochemical evidence of chronic liver disease, and likely poor compliance were considered contraindications to isoniazid prophylaxis. Isoniazid was administered as a daily directly observed 300mg dose with 25mg vitamin B6.

Inmates whose Mantoux tests were negative after the two rounds of screening were offered HIV testing. If this was negative, they were not followed any further. Mantoux-negative people who declined HIV testing were offered a single chest x-ray. Diagnosed HIV-positive, Mantoux-negative inmates who were contacts of the cases were assessed for isoniazid prophylaxis.

Details of prisoners released before completed screening and assessment were passed onto the State TB coordinator for follow-up in the community.

RESULTS

Nine hundred and forty-three male inmates were identified as contacts of the two infectious cases. Of these inmates, 623 (66 per cent) were screened at the first round. The remaining 320 (34 per cent) had been released before screening. Of the 623 screened in correctional centres, 255 (41 per cent) were Mantoux-positive in the first round of screening (including 30 per cent of the Australian-born and 68 per cent of overseas-born inmates). Of the 368 Mantoux-negative inmates who had been screened in correctional centres, 150 were screened a second time in correctional centres, and of these, 22 (15 per cent) tested Mantoux-positive.

A total of 270 Mantoux-positive and high-risk inmates had received chest x-rays at the time of writing. Of these, 208 were allocated to prophylactic isoniazid.

Five hundred and ten staff were also screened with Mantoux tests; 176 (35 per cent) were Mantoux-positive.

No cases of active TB were detected among inmates or staff.

DISCUSSION

An increase in TB occurred throughout the world in the latter half of the 1980s. Total notifications increased to almost 3.8 million cases, and notification rates increased by 20 per cent to a global rate of 74.6/100,000 in 1990[1]. Increases were experienced in most developing regions, and also the USA. Crude TB incidence rates in NSW increased from an historical low of 5.2/100,000 in 1986 to 7.6/100,000 in 1995. The latter rate is still low by international standards.

Overseas studies indicated that correctional centres are potentially important in the propagation of TB, and probably contributed to the recent increase observed in the USA. In a New York county, for example, cases associated with correctional centres comprised 24 per cent of all cases in 1988-90[2]. The potential for transmission in correctional centres was further highlighted by the 1991 outbreak of multi-drug resistant tuberculosis (MDR-TB) in a New York correctional centre which resulted in the deaths of seven HIV-positive inmates and one staff member[3]. High rates of HIV infection, HIV and TB co-infection, frequent movements of inmates, high rates of incarceration, crowding[4], and poor ventilation, have all contributed to TB transmission in US prisons[5]. In contrast, HIV and TB co-infection and MDR-TB are not important features of the epidemiology of TB in NSW[6,7], and rates of HIV in the inmate population are not high (Butler T, unpublished data). However, there are features that potentially facilitate the transmission of TB in the NSW correctional centres, particularly frequent movements of inmates (30,000 movements a year), and the presence of inmates from high prevalence countries.

This preliminary Mantoux screening data indicate a high prevalence of positive Mantoux reactions within correctional centres. However, this needs to be interpreted cautiously, in view of the over-representation of high prevalence groups in correctional centres, and the characteristics of the inmates tested as a result of contact tracing, who were not necessarily representative of the population of inmates as a whole. The risk of infection with *Mycobacterium tuberculosis* due to contact with the infectious cases is the subject of ongoing analysis.

Contact tracing affords a method of disease control that is potentially useful. However, it is logistically difficult, and loss to follow-up and non-compliance are likely to be significant[8]. The potential for multiple contacts is high in correctional centres, and successful disease control through contact tracing is enhanced by prompt diagnosis.

To reduce the risk of TB transmission further, education of staff and active surveillance for cases has already been instituted in NSW correctional centres. The problems encountered in a larger contact tracing effort in correctional centres underline the importance of a systematic approach to TB control in the correctional centres. Further analysis of data from this investigation will help in the formulation of further recommendations on both future contact tracing efforts and the value of routine screening of inmates.

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TRENDS

In October, numbers of infectious diseases notifications from across the State were about the same as, or (for most vaccine-preventable diseases) lower than, in previous years (Figures 4 and 5). Notifications of **hepatitis A**, however, remained almost twice the historical average. Cases were mainly reported from South Eastern Sydney, Central Sydney, and Mid-Western NSW areas. While lower than in past years, reports of **pertussis** have increased in recent weeks (see below). Reports of **measles** cases continue to stream in from the Northern Rivers Area, mainly among unvaccinated children.

PERTUSSIS[1-3]

Reports of pertussis cases in NSW have been increasing in recent months. In October 1996, 103 cases were reported, up from 69 in September and 61 in August. In October 1995, 158 cases were reported. Last month's cases were largely reported from South Eastern Sydney, Northern Sydney, Central Coast and New England areas (Table 2). Among the October cases was a month-old baby who was admitted to hospital and died of the infection. The child's sibling was also diagnosed with pertussis. Here we review this potentially tragic, yet preventable, disease.

The disease

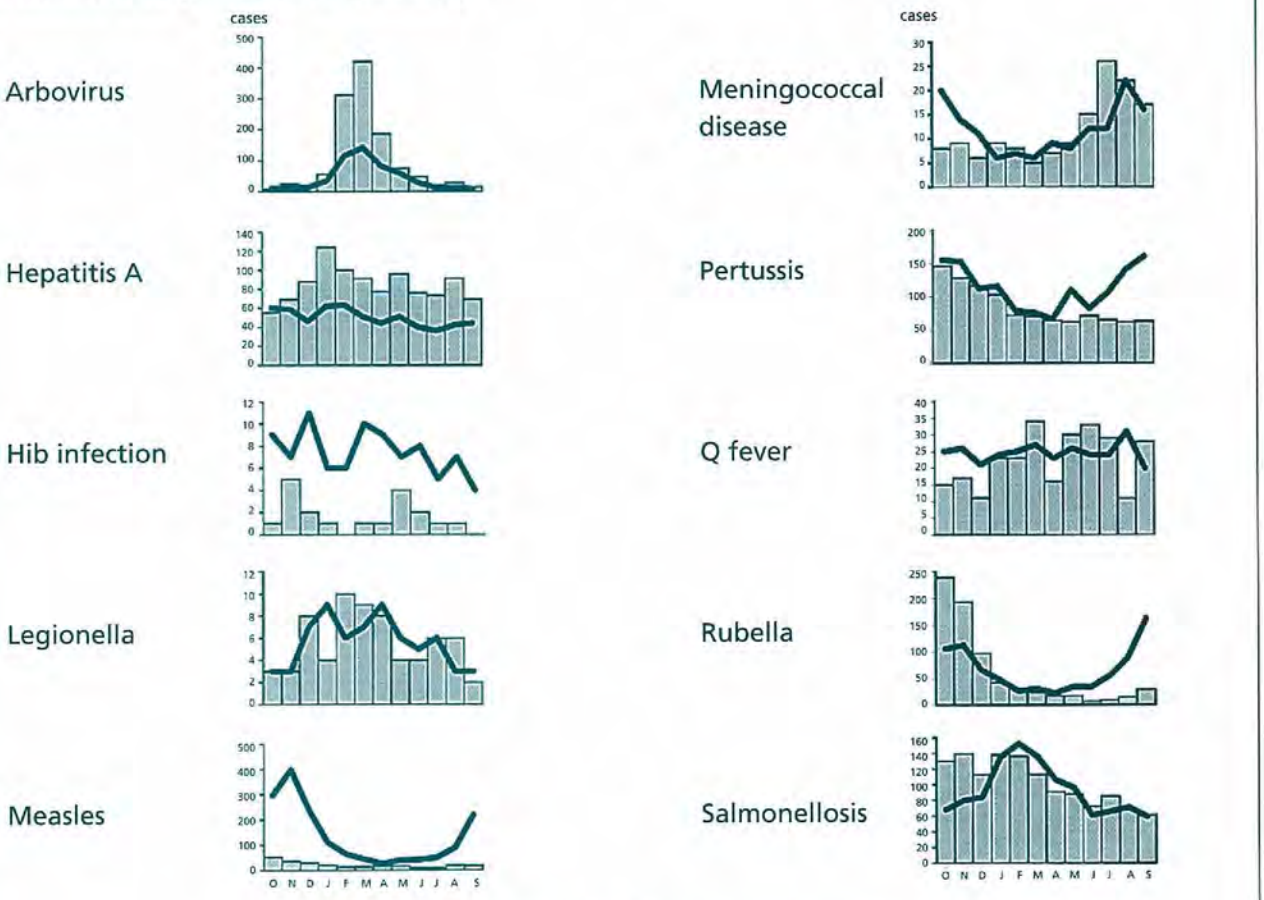
Pertussis causes an estimated 51 million cases and 600,000 deaths a year worldwide, mostly in countries where access to vaccine is limited. In most populations pertussis is endemic, with epidemic cycles occurring every 3-5 years. The disease is most severe in small children. It begins with a catarrhal stage (including rhinorrhoea, tearing, mild conjunctivitis, malaise and low grade fever), and evolves into classic whooping cough. Cough paroxysms include short expiratory bursts followed by an inspiratory gasp that can result in the typical whoop. Not all children will develop a whoop, however. Paroxysms can be severe enough to cause cyanosis, may occur >30 times in a 24-hour period, and tend to be more frequent at night. They may occur spontaneously or after external stimuli such as loud noises or cold air, and typically end with episodes of vomiting. Between paroxysms the patient appears relatively well.

Transmission, diagnosis

Pertussis is transmitted primarily by aerosol droplet from

FIGURE 4

REPORTS OF SELECTED INFECTIOUS DISEASES, NSW, 12 MONTHS TO SEPTEMBER 1996 BY MONTH OF ONSET (WITH HISTORICAL COMPARISON)



infected children or adults, with the highest attack rates seen among people exposed to a coughing patient. Untreated, pertussis is highly communicable early in the disease, and up to three weeks after onset or five days after starting antibiotics. Diagnosis depends on clinical suspicion, and laboratory isolation of *Bordetella pertussis* by nasopharyngeal culture, or serum antibodies in people with suggestive symptoms. Duration of symptoms may be shortened if erythromycin is given early in the disease.

Prevention

Preventive therapy with erythromycin has been shown to be effective in controlling household transmission and outbreaks, and is recommended for contacts of active cases. The patient's household and other close contacts should receive erythromycin for 14 days regardless of immunisation status, within three weeks of illness in the index cases. Care should be taken to ensure all children in contact with cases are fully immunised. The NHMRC recommended schedule now includes a fifth dose of pertussis vaccine (as Triple Antigen) at 4-5 years before the child starts school. This fifth dose is expected to extend the duration of protection of the vaccination, and should lead to fewer cases among school-aged children. Parents of all children entering school or child care facilities are required to provide immunisation certificates or documented evidence of vaccination status. Cases should be excluded from school, other institutions or work for 14 days from the onset of illness or until they receive at least the first five days of a 14-day course of antibiotics. Contacts who are not age-appropriately immunised (i.e. four doses by 18 months, and now five doses by five years of age) may be excluded from child care facilities and preschools.

Notify cases to your Public Health Unit

Doctors and hospitals staff should telephone their Public Health Unit to report suspected cases who have a coughing illness with paroxysms of coughing, inspiratory whoop without other apparent cause, or post-tussive vomiting. Laboratory staff should report all those who test positive for the disease. Public Health Unit staff can assist medical practitioners, schools and child care facilities in ensuring appropriate control measures are taken to prevent further transmission of this serious illness.

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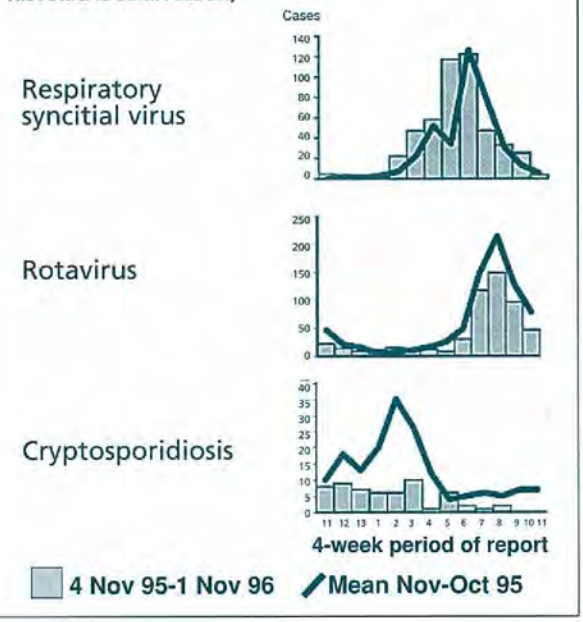
FIGURE 5

LABORATORY REPORTS OF SELECTED INFECTIOUS DISEASES, EASTERN SYDNEY LABORATORY SURVEILLANCE PROGRAM, 13 X 4 WEEK PERIODS (1 YEAR) TO NOVEMBER 1, 1996 (AND HISTORICAL COMPARISON)



MEETINGS

Infectious Diseases Advisory Committee (IDAC)

At its October meeting, IDAC discussed the possible addition of giardiasis and *Vibrio* species infections to the schedule of notifiable diseases. Recommendations will be finalised at the next meeting. The revised Infectious Diseases Surveillance System (IDSS) database should be in operation by February 1997, with the next version ready some months later. IDAC will meet again in February 1997.

TABLE 2

INFECTIOUS DISEASE NOTIFICATIONS FOR NSW IN OCTOBER 1996, RECEIVED BY AREA HEALTH SERVICE

Condition	Area Health Service																	Period	
	CSA	NSA	WSA	WEN	SWS	CCA	HUN	ILL	SES	NRA	MNC	NEA	MAC	MWA	FWA	GMA	SA	Total* for Oct	Year to date
Blood-borne and sexually transmitted																			
AIDS	12	5	3	–	5	2	–	–	19	10	1	–	–	–	–	4	–	61	389
HIV infection	HIV infection is reported bi-monthly																		
Hepatitis B – acute viral	1	–	–	1	–	–	2	–	–	–	–	–	–	–	1	–	1	8	39
Hepatitis B – other	74	54	120	19	115	2	8	6	69	2	3	7	2	8	2	6	4	501	4,322
Hepatitis C – acute viral	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	–	1	12
Hepatitis C – other	96	57	255	87	137	43	44	37	183	28	30	19	2	32	2	18	17	1,087	7,928
Hepatitis D – unspecified	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	8
Hepatitis, acute viral (NOS)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	4
Gonorrhoea	6	3	3	–	1	1	–	1	34	–	2	–	2	–	–	–	–	53	458
Syphilis	6	3	3	2	7	1	2	–	14	–	3	7	1	2	–	–	–	51	671
Vector-borne																			
Arboviral infection	–	–	1	–	–	–	1	1	–	10	5	2	1	–	–	2	–	23	1,193
Malaria	3	3	1	–	1	–	1	–	5	1	–	–	–	–	–	–	–	15	194
Zoonoses																			
Brucellosis	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	1
Hydatid disease	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1	13
Leptospirosis	–	–	–	–	–	–	–	–	–	–	–	1	–	–	–	–	–	1	23
Q fever	–	–	–	–	–	–	1	–	–	1	2	7	7	1	2	–	1	22	242
Respiratory/other																			
Legionnaires' disease	2	–	1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3	58
Meningococcal (invasive) infection	1	1	3	2	4	–	1	–	–	2	1	–	–	–	–	1	–	16	133
Leprosy	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1
Mycobacterial tuberculosis	6	7	3	1	9	–	2	–	4	–	1	–	1	–	–	–	1	35	367
Mycobacteria other than TB	8	5	3	–	6	4	2	–	7	2	–	–	–	–	–	–	–	37	382
Vaccine-preventable																			
Adverse event after immunisation	–	–	1	–	1	–	–	–	–	–	–	–	–	–	–	–	–	2	39
H.influenzae (invasive) infection	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	12
Measles	1	–	–	–	1	1	1	1	5	9	1	–	–	–	–	–	–	20	173
Mumps	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	–	–	1	22
Pertussis	3	17	4	8	8	10	6	2	19	1	3	12	3	3	2	1	1	103	784
Rubella	10	–	6	3	–	–	5	2	2	–	–	–	–	–	–	–	–	28	325
Faecal-oral																			
Cholera	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	3
Foodborne illness (NOS)	–	–	–	–	4	2	–	–	–	–	–	1	–	–	–	–	–	7	102
Gastroenteritis (instit)	8	–	–	–	19	17	–	–	39	–	–	–	–	–	–	–	–	83	467
Hepatitis A	8	3	1	3	2	3	3	–	15	1	–	4	–	7	4	2	2	59	878
Listeriosis	–	–	–	–	–	–	–	–	3	–	–	–	–	–	–	–	–	3	13
Salmonellosis (NOS)	3	20	4	1	5	1	7	4	9	6	1	1	1	3	–	4	–	70	970
Typhoid and paratyphoid	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	–	–	1	33

* Includes rates with unknown postcodes.

Abbreviations used in this Bulletin:
CSA Central Sydney Health Area, SES South Eastern Sydney Health Area, SWS South Western Sydney Health Area, WSA Western Sydney Health Area, WEN Wentworth Health Area, NSA Northern Sydney Health Area, CCA Central Coast Health Area, ILL Illawarra Health Area, HUN Hunter Health Area, NRA Northern Rivers Health Area, MNC Mid North Coast Health Area, NEA New England Health Area, MAC Macquarie Health Area, MWA Mid West Health Area, FWA Far West Health Area, GMA Greater Murray Health Area, SA Southern Health Area, OTH Interstate/Overseas, U/K Unknown, NOS Not Otherwise Stated.

Please note that the data contained in this Bulletin are provisional and subject to change because of late reports or changes in case classification. Data are tabulated where possible by area of residence and by the disease onset date and not simply the date of notification or receipt of such notification.