

Medical Officer of Health Report

July 2013

Tuberculosis

Tuberculosis (TB) is well known to those familiar with literature set in Dickensian times and those that have worked in developing countries. However, I often find that when the subject of TB comes up in conversations, people are surprised to hear that 'we still have TB in New Zealand'. The work of our public health TB services is largely unseen and indeed it could be said that this is what characterises success in this area. In New Zealand, including locally in the Bay of Plenty and Lakes districts, we have robust and well-coordinated clinical and TB control services. I thought it would be valuable and interesting to outline briefly this area of work and relevant TB issues and epidemiology.

TB is typically not well understood by the public – and also to some extent by many health professionals in developed countries where TB is uncommon. In addition TB 'incidents', such as the occurrence of a case of TB in a school, routinely attract disproportionate levels of media scrutiny and public concern.

It is important to recognise that failure to control TB can indeed result in resurgence of this disease and high costs to society and health services. The New York City TB epidemic that developed in the late 1980s with a peak of 3,800 cases occurring in 1992 provides salient lessons in TB risk management (Coker, 1998). Social issues, as well as prior funding cuts to TB control services in New York State, fragmented services, and insufficient public health surveillance and intervention were identified as key contributors to the city's epidemic (Hayward and Coker, 2000). Apart from the human costs and suffering related to the TB epidemic, the cost to health services for this epidemic was estimated to be in excess of US\$1 billion.

The prevention of local emergence of multi-drug resistant TB (MDR TB) is one of the goals of an effective public health TB service. A recent German study estimated that the cost of treating one case of MDR TB is about NZ\$86,000 compared to NZ\$12,000 for standard treatment (Diel et al, 2012). Fortunately, or rather at least in part attributable to effective public health services, MDR TB remains rare in New Zealand.

Globally, approximately one third of the world's population (or more than two billion people) have latent TB infection; this means they have been infected with the TB organism (*Mycobacterium tuberculosis*) and have approximately a one in 10 risk of developing the disease at some stage in their life. It is estimated that there are about nine million new cases of active TB disease each year and that 1.4 million people die from TB each year (WHO, 2009). The good news is that through concerted public health action TB incidence globally is beginning to fall and the risk of dying from TB has fallen considerably in recent years.

The incidence of TB (new cases per year) in New Zealand is approximately seven per 100,000 people. This rate is much lower than that of most developing countries (where

incidence can be over 300 per 100,000) and similar to other developed countries such as Australia and the United Kingdom. Active case management, effective clinical services and public health intervention along with improved socio-economic and living conditions have all contributed to a steady decline in the incidence of TB in New Zealand since a peak last century in the decade during and immediately after World War II.

Table 1. TB incidence in a selection of developed countries (WHO, 2009)

	TB incidence*
New Zealand	7 / 100,000
Australia	6 / 100,000
United States of America	4 / 100,000
Canada	4 / 100,000
United Kingdom	11 / 100,000
*Defined as the number of new, reactivated or relapsed cases occurring each year (per 100,000 population).	

In 2009, TB incidence in the Bay of Plenty and Lakes District Health Board areas was similar to the national incidence. The following table shows the rates of TB disease for a selection of district health boards in the North Island in 2009.

Table 2. Incidence of TB in 2009 in a selection of comparable district health boards

DHB	Number of TB notifications	Incidence of TB disease (notifications per 100,000 population)
Auckland Central	63	14.2
Tairāwhiti	6	13.0
Lakes	7	6.9
Bay of Plenty	12	5.8
Hawkes Bay	8	5.2
Northland	8	4.5
Waikato	16	4.5
New Zealand	304	7.0

The key goals of public health management of TB are to manage community risk and to reduce the burden of disease. This involves the early diagnosis of cases, prompt notification of cases to the Medical Officer of Health, effective treatment of cases, managing infection control, contact tracing to identify and treat infected contacts and secondary cases, and management of clusters and outbreaks.

TB is the only disease with an entire Act of Parliament dedicated to it. The *Tuberculosis Act 1948* provides the Medical Officer of Health with powers that enable contact tracing as well as powers to enforce compulsory investigation and treatment of cases (Section 9). It even provides powers for the detention of infectious cases who refuse treatment (Section 16). While, on occasion, non-compliant cases are made aware of these powers they have very rarely been enforced in New Zealand and are generally costly and impractical to implement. Rather than the use of coercive measures, compliance with treatment and infection control is almost always achieved through the persistent and highly skilled work of experienced practitioners, namely our TB Public Health Nurses.

A key component of TB public health nursing work is providing ongoing support for patients and includes providing advice on taking medication, supporting patients to manage other issues (eg alcohol use), ensuring patients attend out-patient appointments, and helping patients to understand and implement specialist advice provided. Public Health Nurses work with patients that are non-compliant, find patients that 'go missing' or that miss clinical appointments, and on occasion they provide supervised drug treatment (or directly observed therapy, known as DOT). DOT is where every dose of TB medication taken by the patient is observed and recorded by the supervising Public Health Nurses. Globally and in New Zealand DOT is an important intervention to ensure compliance with treatment, to reduce the risks of transmission, and reduce the risk of MDR TB developing.

TB is not easily spread from person to person and infection usually only results from prolonged and regular exposure to an infectious person, such as might occur in the household environment. Contact tracing for TB is a coordinated and systematic process managed by public health in order to identify and offer information and screening to any close contacts of an infectious case of TB.

Contact tracing and screening is typically undertaken for all household contacts of cases who have active TB in the lungs. Depending on the assessed level of risk and level of exposure, other contact groups that may be offered screening include, for example: close social contacts; hospital staff and hospital patients; school staff and students; children in childcare and early education centres; workplace contacts; and, aircraft passengers. With larger contact tracing exercises, maintaining coordination of the process and working with the media, typically to provide reassurance and avoid undue community alarm, are key challenges.

And a note on vaccination: BCG vaccination is the only vaccine for TB, however, its proven value is limited to preventing more serious forms of TB in young children. Consequently, it is currently only offered in a targeted programme for children under five years of age who have specific risk factors that place them at particular risk of TB. For those at risk it is best given soon after birth.

Notwithstanding the range of clinical and public health service interventions to manage TB, it should be recognised that underlying socio-economic and living conditions, such as overcrowding, remain important drivers of TB and other infectious disease risks. Reducing risks and preventing resurgence of various infectious diseases in our communities will not only require effective clinical and public health services, but also sustained public health action across society to achieve improvements in these areas.

References

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Notifiable Diseases Lakes District Health Board June 2013

Disease	Lakes (1)		Lakes (2)		DISEASE RATE (3)	
	2012	2013	2012	2013	LAKES	NZ
Campylobacter	9	5	160	153	148.4	140.3
Cryptosporidium	0	3	20	64	62.08	30.5
Giardia	5	7	50	61	59.17	37.3
Meningococcal Disease	0	0	3	6	5.82	1.8
Pertussis	13	2	57	69	66.93	122.3
Rheumatic Fever (4)	1	1	7	6	5.82	3.0
Salmonella	3	1	34	21	20.37	25.3
Tuberculosis (5)	0	1	3	7	6.79	6.3
VTEC E.Coli	0	0	3	3	2.91	4.9
Yersinia	1	1	17	18	17.46	10.6

- (1) Number of notifications per month, June 2012 and June 2013
- (2) Number of notifications for the twelve months to June for 2012 and 2013
- (3) Number of cases per 100,000 population for the twelve months to June 2013
- (4) Initial attack of Rheumatic Fever (does not include recurrent cases)
- (5) New cases of Tuberculosis only (does not include latent or reactivations)

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