A VISITOR FROM ABROAD

Address to the Auckland Medico-Legal Society by the incoming President, Dr Margaret Wilsher, April 3, 2007

This address centres on the true story of one patient, with a disease as old as antiquity, a disease that affects millions, and beleaguers poor nations. A disease that only 50 years ago was thought possible to eradicate – new treatments, social advancement and public health measures bringing it to its knees in the western world. But a new ally in the form of co-existent HIV infection and a new vector – air travel - have contributed to its resurgence in a guise more threatening than ever.

Mrs T as I will call her, a 67 year old South Korean visitor, presented to her daughter's GP in February 2005 complaining of chest pain. The GP organised a CXR and on receiving a report suggesting active tuberculosis admitted her to the regional TB service at Auckland City Hospital. Mrs T was nursed in isolation pending the result of her sputum cultures. As predicted she proved highly infectious with direct smear of her sputum demonstrating numerous tubercle bacilli**.** The GP was not aware that Mrs T had a history of tuberculosis nor was he aware that she was currently receiving treatment because she did not disclose those facts.

Tuberculosis (and I shall use the abbreviation TB interchangeably) is one of the most common infectious diseases, affecting some 9 million people worldwide and causing some 2 million deaths per annum. More than 80% of TB patients live in subSaharan Africa or Asia. The disease is caused by infection with *Mycobacterium tuberculosis* with the development of a pneumonic illness in those hosts who prove ineffective at containing the primary infection – approximately 10% of those infected**.** Once tuberculosis develops, the disease is spread by cough and droplet infection – those in crowded and poor living conditions are most vulnerable. Death is by wasting and respiratory failure – better known historically as consumption. Sometimes patients have a catastrophic end through massive pulmonary haemorrhage - as Katherine Mansfield was to suffer.

Tuberculosis occurred as an endemic disease among animals long before it affected humans. The first human infections were with *Mycobacterium bovis* – a pathogen of

importance in New Zealand agriculture to this day; possums and deer being sources of infection. Tuberculosis in humans was sporadic in early history but it was still regarded with fear – albeit Deuteronomy rather overstates things.

The Lord will smite you with consumption, and with fever, inflammation, and fiery heat, and with drought, and with blasting, and with mildew: and they shall perish.

Deuteronomy 28:22'

The human epidemic, which began slowly with increasing population density, spread world wide with colonisation of the great continents. So common was TB in 18th century Europe that one in 4 died of the disease. It became romanticised in opera and literature with young consumptive women portrayed as doomed heroines.

Tuberculous sufferers were all too aware of their prognosis, many of them having seen off their siblings or parents to an early grave.

Now more than ever seems it rich to die,
To cease upon the midnight with no pain,
While thou art pouring forth thy soul abroad
In such ecstasy!

Keats. Ode to a Nightingale, 1820

As he languished from tuberculosis, Keats wrote his greatest odes – he was to die at the age of 25. So many other artists suffered the same fate…… Robert Louis Stevenson, Frederick Chopin, Elizabeth Barrett Browning, Franz Kafka. The Brontë family was particularly struck by TB, with Anne, Branwell, and Emily all dying of it within 2 years of each other.

It was recognised that tuberculosis was associated with poor sanitation and over-crowding and it was considered a disease of the poor.

"Tubercle is in truth a coarse, common disease, … and the beautiful and the rich receive it from the unbeautiful poor"

Herbert de Carle Woodcock, Council of the National Association for the Prevention of Consumption and other forms of Tuberculosis, 1912

Mr Woodcock went on to say "***legislation has had much to say concerning hours of work and overcrowding of workshops; but it has little to say of physical dirt, and nothing to say of moral dirt and I hope to see the day when tubercle and alcoholism …. will be under rigorous inquisition***".

At that time, consumptive sufferers were actually encouraged to immigrate to New Zealand in the hope of thriving in a healthier environment – at the same time ridding England of a scourge. The forbearer of one of our own society members chose his passage on such medical advice:

Father,…had had several severe haemorrhages from his lungs. A consulting physician in Harley Street had told him that his only hope of survival was to come to New Zealand.

A Eisdell Moore. Operation lifetime: the memoirs of a New Zealand surgeon. 1964

According to Mrs Eisdell Moore, as they were embarking an officer on the ship was overheard to say ***"there goes another one over the side"***

New Zealand Maori were particularly devastated by the infectious diseases brought to this country by the new immigrants. At the beginning of this century only 42,000 remained. The Maori had several names for tuberculosis, the commonest one being ***mate kohi*** - the wasting disease. The first Maori doctor, Sir Maui Pomare, succumbed to tuberculosis at the age of 54, whilst still a Member of Parliament.

Throughout the 20th century, TB notifications steadily declined reaching a nadir in the mid 1980s, but from that point notifications in Western nations began to rise, alarming public health officials who thought the disease was under control.

The necessarily complicated and lengthy antibiotic courses required for tuberculosis cure are difficult to administer even in wealthy nations – it has proven almost impossible to apply such treatment in third world countries where inadequate treatment regimens are prescribed, medications are unfunded and dosing is not supervised. Inadequate or incomplete TB treatment can foster the development of drug-resistant mutants and transmission of such organisms is abetted when people are crowded into substandard conditions such as Russian prisons, the barracks associated with South African mines, refugee camps, and urban slums. Poor prison-type conditions, in particular, serve as an "epidemiological pump," potentially generating millions of cases of new infections.

Multi-drug, as opposed to single drug, resistant strains of tuberculosis were first reported in the 1980s, and in 2006 WHO convened a global task force to address a further category of TB - extensively resistant tuberculosis or XDR-TB – that form of the disease resistant to most antibiotics and hence potentially untreatable. Certain nations, notably Korea and Latvia, have particularly high rates of XDR-TB.

Described as "Ebola with wings," drug-resistant tuberculosis is spreading throughout the globe, creating the potential for a deadly global pandemic. International air travel has been described as one of the "open spigots" for its transmission.

"*Aircraft passengers spread TB in a way that cannot be controlled. The [Boeing] 747 is the vector of this disease and it is not susceptible to vector control,"*

Paul Nunn, Infectious Diseases Expert WHO, 2004

Air travel is bringing the problem home to many countries where tuberculosis was thought to be under control and multi drug resistant TB has now been recorded in 104 countries – courtesy of the aircraft that you and I travel in.

At the time Mr Eisdell Moore immigrated to New Zealand, the migration of TB from country to country could be likened to that of a spreading ink blot. However, international air travel literally leapfrogs the traditional means by which tuberculosis spreads, enabling infected persons to carry the disease from one continent to another in less than a day.

In New Zealand, immigration is the single biggest determinant of drug resistant TB. Data from public health notifications indicates that all cases of multidrug resistant TB between 1995 and 2000 occurred in the foreign born. This in turn reflects the high prevalence of tuberculosis in people born outside of this country.

Returning to Mrs T - her organism was resistant to all commonly used anti-tuberculous antibiotics and to most of the second line drugs. She had, by definition, extremely drug resistant tuberculosis and was untreatable, and hence incurable – and worse she was highly infectious and likely to remain so until she died of her disease.

How had that happened? Mrs T, with encouragement and the help of an interpreter, divulged some of her history. She had first been treated for TB at the age of 28 but admitted she had not taken the drugs as prescribed – almost certainly she was not cured at that time and by her own actions had unwittingly allowed resistant strains to develop. She was then retreated in 2004 but with only three second line drugs and when that failed another three. At no time was her therapy directly observed. (DOT). This would be regarded by WHO as totally inadequate management and as such, the Korean doctors effectively condemned her to die.

Mrs T entered New Zealand under the visa waiver scheme which allowed for 3 months stay in New Zealand without health screening. Her daughter, who lives here, admitted arranging the trip with full knowledge that Mrs T had untreatable TB, and told staff that Mrs T hid her TB medications, so that her state of health would not be detected at the border.

Once in the country Mrs T subsequently applied for a visitor permit which if approved would allow her to stay for up to 9 months. She did not disclose any information to the New Zealand Immigration Service that might indicate her public health risk or her potential need for treatment and the subsequent cost to the health service.

Thus, the clinical team looking after Mrs T were faced with a number of clinical, public health and ethical issues.

Mrs T posed a serious hazard to the health of the staff caring for her, and her family visitors. Against her wishes she was confined to hospital, to a negative pressure room with regular use of a facial mask. Because of her intent to seek discharge Mrs T was advised by the Medical Officer of Health that under section 9 of the Tuberculosis Act, 1948, she must submit to the necessary testing to enable the diagnosis of tuberculosis. This act also empowers the Medical Officer of Health, via Court Order, to detain any infectious patient who puts the community at risk. It is based on utilitarianism principles as first espoused by John Stuart Mill in 1859.

"*That the only purpose for which power can be rightfully exercised over any member of a civilised community, against his will, is to prevent harm to others. His own good, either physical or moral, is not a sufficient warrant*"

On Liberty 1859

Not withstanding such, the decision to issue a detention order is not taken lightly. Perhaps more significantly, the legislative framework in New Zealand does not expressly provide power for a Medical Officer of Health or Court to order treatment. The patient can be tested, given directions for preventing spread, and ultimately detained, but short of the patient lacking capacity to decide, it is unlikely that they can be forced to receive treatment

In New South Wales, Health Department Circular 94/88 outlines the steps required to issue a public health order for non-compliant patients with TB. The patient must be counselled and warned, and obstacles to compliance must be identified and rectified. If such interventions fail then a detention order may be signed by the Chief Health Officer and the patient confined to a secure health facility.

The difficulty of this approach is highlighted by a recently publicised case in that state. The patient, a Chinese national on a student visa, had been poorly compliant with therapy and his initially sensitive organism had become resistant. He was detained but in protest stopped eating and lost weight. This highlights the fact that serving an order does not resolve the conflict - it merely provides a legal basis for detention. It does not ensure compliance, understanding or improved behaviour.

Hospital clinical staff testified (as they have in this country) to the unsuitable nature of their facilities for the detainment of patients who are unwilling to subject to such. In spite of a 24 hour guard on his door the patient escaped and remains at large in the community, presumably still in Australia and presumably still infectious.

WHO states that nations have the right to detain individuals – stating that if a patient is a danger to the public, the serious risk posed by XDR-TB means that limiting that individual's rights may be necessary to protect the wider public. Thus interference with freedom of movement when instituting quarantine or isolation may be necessary for the public good and could be considered legitimate under international human rights law.

A key factor in determining if the necessary protections exist when rights are restricted is that each one of the five criteria of the Siracusa Principles is met:

- ***The restriction is*** *provided for and carried out* ***in accordance with the law****;*
- *The restriction is* ***in the interest of a legitimate objective*** *of general interest;*
- *The restriction* ***is strictly necessary*** *in a democratic society to achieve the objective;*
- *There are no less intrusive and restrictive means available to reach the same objective;*
- *The restriction* ***is based on scientific evidence*** *and not drafted or imposed arbitrarily i.e. in an unreasonable or otherwise discriminatory manner*

In the case of Mrs T the Siracusa principles were met. She was lawfully required to submit to testing, and such testing was scientifically valid, necessary and of public health importance.

Mrs T's clinicians felt that the public health risk was so great that another, often considered inviolable, right – that of patient confidentiality - should be over-ruled in this case. The New Zealand Immigration Service was advised of the public health risk and her application for visitor's permit was declined.

New Zealand is part of the WHO Western Pacific region which includes China and Korea. With the exception of Africa this region has the highest prevalence of MDR in the world. New Zealand has only recently tightened its immigration screening in the light of a number of highly publicised outbreaks of tuberculosis from index cases including international students and those on short term visitor's visas originating from this region. In announcing changes to immigration health screening policies on World TB day, it was indicated that New Zealand could not afford to be complacent about tuberculosis. During the time that Mrs T spent in Auckland City Hospital, no less than 4 international students were under treatment for highly infectious tuberculosis – who knows how many individuals they infected before presentation.

It is well recognised that tuberculosis sufferers may delay presentation to health authorities if they fear persecution from immigration authorities or are unable to bear the cost of TB investigation and treatment. In New Zealand compulsory services provided under the Tuberculosis Act (and other legislation) are free. Examinations ordered by a Medical Officer of Health under section 9 of the Tuberculosis Act will see state funding of such. This creates obvious discordance – there is an incentive for patients to refuse care; and examinations are made compulsory simply to access funding. However plans for the New Zealand Immigration Services information systems to link with public hospital information systems, as currently being trialled in Canterbury, pose a significant risk. If visitors perceive that hospital or clinic attendance will jeopardise their stay in New Zealand, those patients will be driven underground taking their TB with them. In such a setting they may attempt treatment through other means – black market drugs for example – thus setting the scene for home-grown as opposed to imported drug resistant TB.

Mrs T was advised on the 2nd April 2005 that her application for a visitors permit was declined. Realising that she would be deported she consented to voluntary return to Korea. That was not to be straightforward as no commercial airline would consent to carry her. The risk of infection to other passengers was considered too great. During the SARS epidemic a number of infections were traced to concomitant travel with an index case. Avian influenza is predicted to spread globally in the same manner.

According to a 1998 report by WHO on Tuberculosis and Air Travel, the HEPA filters on many airliners should remove the tubercle bacillus. In addition, cabin air circulates from the overhead to outflow vents near the floor with laminar airflow limiting air entering and leaving the cabin to the same seat row. With modern cabin pressurization systems the cabin air is completely exchanged at least 20 times per hour.

In spite of such, a number of cases of TB infection have been reported following commercial air travel. The CXR of the index case in the sentinel New England Journal of Medicine report (1996) looks strikingly like that of Mrs T. To date WHO advise that no cases of full blown pulmonary tuberculosis have developed as a consequence of air travel.

Korean Air was advised of the infectious risk caused by Passenger T. WHO guidelines recommend tracing and informing passengers and crew members if they have been on a flight lasting more than 8 hours with a highly infectious person. We have been unable to ascertain from the airline whether that screening took place.

It was clear that Mrs T could not return via any commercial airline. With an agreement between the New Zealand Immigration Service and the Ministry of Health, a jet with a negative pressure chamber especially designed for the SARS epidemic was chartered at a cost to the New Zealand taxpayer of $330,000. Her transport was arranged in the early hours of the morning to avoid media scrutiny which by this time was becoming evident. On the 5th May 2005 at 0300 she left for Korea.

At the end of the day the story of Mrs T is simply that of a patient with an incurable disease. She was the victim of poor tuberculosis education, inappropriate prescribing of antibiotics, lack of access to directly observed therapy, and woeful public health management in her country of origin. She, like so many other patients with lethal disease, sought medical assistance in a country thought able to deliver such. Desperation leads people to deception and dishonesty.

WHO has declared tuberculosis a Global Emergency and in partnership with non profit organisations, has implemented a raft of measures with which to combat it. That

requires an enormous amount of funding from Western nations – those very nations whose populations are now threatened by a disease which until recently, was regarded with complacency. It also requires the support of the hugely wealthy pharmaceutical industry – no new classes of TB drugs have emerged in the last 30 years despite one third of the world's population having been infected. The market that could afford such new drugs is too small to justify the R & D costs!

The latest WHO statistics for South Korea indicate that over 30,000 patients developed tuberculosis in 2003. New Zealand receives over 100,000 visitors from Korea each year, the vast majority travelling by air.

Enjoy your next trip abroad and remember that careless coughing costs lives!