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Cases of Tuberculosis rise steeply during 2005

The great majority of human tuberculosis infection cases are contracted as a result close proximity to an infected person with overt illness. 10% of infected people will become ill with the disease, in most circumstances, carriers who are well will not act as a source of infection. In the UK most new cases are among those who contracted the disease while resident abroad.

The official statistics on the incidence of tuberculosis in England, Wales and Northern Ireland have been published.

There has been a steady increase in the number of new diagnoses of TB over recent years:

Year	Number of new cases	Rate per 100,000	Annual change %
2000	6,323	11.7	
2001	6,652	12.3	+ 5.2%
2002	6,861	12.6	+3.1%
2003	6,970	12.8	+1.6%
2004	7,321	13.4	+5.0%
2005	8,113	14.7	+10.8%

The incidence rate was three times higher in London, above average in the West Midlands and below average in Wales, Northern Ireland and the North East. It is a Notifiable disease.

TB is spread from person to person by coughs and sneezes but only if the disease is in the lungs (pulmonary TB). 56% of cases of TB were pulmonary TB but the fastest growing incidence was in extrapulmonary TB (found in the brain, kidney or spine for example). TB can lie dormant in the host for many years, but while dormant is not contagious.

The great majority of cases occur between the ages of 15 and 44 (61%), with a slight bias toward men (55%) bias increasing with age. The rate in non-UK born cases was maximum between ages 25 to 29 and at a rate of 180 per 100,000 i.e. more than 10 times the national average. In 2005 72% of all cases were among those not born in the UK a rate of 103 per 100,000 in this demographic. The rate among black african non-uk born people was around 400 per 100,000 in 2005; for Indian, pakistani and Bangladeshi around 200 per 100,000 and for white people less than 10 per 100,000. The report concludes that most cases of infection were acquired abroad.

Information on time from entry into the UK to tuberculosis diagnosis was available for 86% (4576/5310) of non-UK born cases. Of these, 78% had entered the UK two years or more prior to diagnosis (31% had entered two to four years prior, 18% five to nine years prior, and the remaining 29% had entered the UK 10 or more years prior).

99% of cultured samples were *M. tuberculosis* (human-only disease), 0.5% were *M.bovis* (zoonosis e.g. from cattle) and 0.4% were *M.africanum*.

The cost of treating a drug-sensitive case of tuberculosis has been estimated to be £6,040, rising to £60,000 if the organism is multi-drug resistant. In 2004 7% of cases died, mostly among those aged over 65.

In 2005 8.7% of TB cases were resistant to at least one first line drug. Drug resistance was highest in London and lowest in Northern Ireland but did not vary with country of origin.

A tuberculosis incident is defined as a situation where potential transmission of tuberculosis to non-household contacts is identified, warranting wider investigation beyond routine contact tracing. In 2005 the greatest number of incidents occurred in health care settings (161), including hospitals (61%), nursing homes (31%), other medical/health centres and the community. Next highest was in education (93) and then detention (32). In health settings the majority (66%) of cases involved a member of staff, but in education only a minority (14%). There were 7 air travel incidents.

Comment
The most likley source of TB is human to human transmission. The risk is increasing. Risks of acquisition within this country are highest where there is contact with those from overseas.

The World Health Organisation estimates that an untreated active TB carrier can infect on average 10 to 15 people a year. Approximately 5% of patients who have developed tuberculosis infection developed tuberculosis within two years after infection and an additional 5% will develop tuberculosis during their lives. Around one third of the world population are asymptomatic carriers.

The great majority of incident cases are due to disease acquired while overseas.

Outbreaks do occur, mostly in hospital or educational settings.

The protective effect of BCG vaccination has been shown to last over 20 years. BCG is not 100% protective; compliance with a vaccination programme does not guarantee protection for the individual or those around him. Estimates of effectiveness range from 50% to 83%. The decline in TB in the West is attributed to improved living standards, isolation of cases and effective treatment.

Once vaccinated antibodies will be present in the blood stream making it difficult to distinguish vaccinated from infected [but asymptomatic] people.

The details:
Inhalation of bacteria suspended in air is practically the only method of infection, particularly following close contact. The bacteria lodge in the pulmonary alveoli and are phagocytosed by macrophages in which they die, remain quiescent or multiply. If they multiply the macrophages are destroyed and the bacteria are released. They are then phagocytosed again by other macrophages and by dendritic cells. The bacteria ingested by dendritic cells are transported in the lymph ducts towards the regional lymph nodes. In the nodes, the infected dendritic cells are then able to induce selection and clonal expansion of specific T (thymus dependent) lymphocytes. After a period ranging from a few days to several weeks, these specific T lymphocytes leave the initial draining lymph node and migrate towards the initial focus or foci of infection where they produce an inflammatory reaction by recognising the living or dead tuberculosis bacterial antigens. A local focus of infection called a tubercle therefore forms gradually, containing living degenerating or fused (giant cell) macrophages, bacteria and lymphocytes. This tubercle may become a granuloma with central necrosis and fibrosis. In most situations the development of specific cellular immunity in which various categories of T lymphocytes play a major role, limits multiplication of bacilli and the person remains asymptomatic. This state is defined as tuberculosis infection (TB infection), also called latent tuberculosis infection or primary infection, indicating the encounter with M. tuberculosis. (National Institute for health and medical research. France 2004)