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Component 1

Incidence of disease in communities

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Introduction

Tuberculosis (TB) is caused by bacteria (*Mycobacterium tuberculosis*) that most often affect the lungs. Tuberculosis is curable and preventable is spread from person to person through the air. When people with lung TB cough, sneeze or spit, they propel the TB germs into the air. A person needs to inhale only a few of these germs to become infected. About a quarter of the global population is estimated to have been infected with TB bacteria, but most people will not go on to develop TB disease and some will clear the infection. Those who are infected but not (yet) ill with the disease cannot transmit it. People infected with TB bacteria have a 5–10% lifetime risk of falling ill with TB. Those with compromised immune systems, such as people living with HIV, malnutrition or diabetes, or people who use tobacco, have a higher risk of falling ill. When a person develops active TB disease, the symptoms (such as cough, fever, night sweats, or weight loss) may be mild for many months. This can lead to delays in seeking care, and results in transmission of the bacteria to others. People with active TB can infect 5–15 other people through close contact over the course of a year. Without proper treatment, 45% of HIV-negative people with TB on average and nearly all HIV-positive people with TB will die. WHO,.(2022)

Tuberculosis (TB) is caused by an infectious bacterial (Mycobacterium Tuberculosis) that most often affects the lungs ... (World Health Organisation, 2022).

In 2021, an estimated 10.6 million people fell ill with tuberculosis (TB) worldwide. Six million men, 3.4 million women and 1.2 million children. TB is present in all countries and age groups. But TB is curable and preventable. 27 Oct 2022., (WHO 2022)

A brief overview of the case study

A 67-year-old Hispanic male presented to a hospital emergency department with a three-week history of night sweats, weight loss, nausea, shortness of breath, and a productive cough. A chest x-ray (CXR) was done and revealed extensive bilateral cavitary disease. Per hospital protocol, sputum specimens were collected and resulted in positive Acid-Fast Bacilli (AFB) with 10 organisms per high power field. He was diagnosed with active pulmonary TB. Griffith D.E., Seaworth B.J., (2017)

Strategies used in the UK **to measure** the incidence of Tuberculosis (TB)

Collecting and analysing data on Mortality and Morbidity are the two strategies used to measure the incidence of the disease. The Collaborative Tuberculosis Strategy for England represents a joint approach by the public health England (PHE), the National Health Service of England (NHSE) to tackle the issue of tuberculosis in the UK. The strategy aims to achieve a year-on-year decrease in incidence, a reduction in health inequalities, and ultimately the eradication of TB as a health problem in England. To achieve these ambitions and deliver significantly in TB control, the strategy sets out improvements in 10 key areas that are required to achieve these improvements. The areas of action are: improving access to services and ensuring early diagnosis, providing universal access to high quality diagnostics, improving treatment and care services, ensuring comprehensive contact tracing, improving BCG vaccination uptake, reducing drug-resistant TB, tackling TB in under-served populations, systematically implementing new entrant latent TB screening, strengthening surveillance monitoring, and ensuring an appropriate work force to deliver TB control (Collaborative Tuberculosis Strategy for England 2015) Morbidity is the symptoms... Mortality statistics provide a valuable measure for assessing community health status. The importance of mortality statistics derives both from the significance of death in an individual's life as well as their potential to improve the public's health when used to systematically assess and monitor the health status of a whole community. Within the realm of public health, mortality statistics are often used as a cornerstone in formulating health plans and policies to prevent or reduce premature mortality and improve our quality of life. Hynes M, et al.

Strategies used in the UK **to monitor** (TB)

Monitoring the burden /level of incident of Tuberculosis include surveillance. It is the data analysis, such as trends, comparison of data between different periods of geographical locations, checking age groups affected, gender and condition that promote the spread of the disease. All TB cases notified to the UK enhanced tuberculosis surveillance systems (Public Health England) between 1st Jan 2011 and 31st Dec 2015 who had country of birth recorded (96% of all cases). Cases were stratified into groups according to year of notification; country of birth and, for non-EU born TB cases, the time between arrival in the UK and TB notification. Population Denominators: To obtain person-year denominators for observed TB cases, a combination of population estimates, and migration data are used. Resident population estimates were drawn from

the office for National Statistics (Public Health England) and stratified by country of birth and year. There is no single source of data on migration flows into and out of the UK (Hawkins, 2017). Pre-entry screening: Data on the number of cases of active TB identified through PES by country were obtained from the Public Health England (PHE) pre-entry screening monitoring system (Public Health England). The number of cases identified through PES were adjusted based on visa approval rate by country and visa type (Home Office) to calculate the number of cases of TB averted among recent migrant groups. Through surveillance we can monitor changes in the virus, the impact of the disease on the healthcare system and the trajectory of the infections.

- Strategies used in the UK **to control** (TB)

Immunisation is one of the most important approaches/measures to control Tuberculosis (TB) The BCG vaccine was introduced into the UK schedule in 1953. At first it was offered to children of school leaving age (14 years old) because TB was most common in young adults at this time. Rates of TB in the UK were already falling, and they continued to fall after the vaccine was introduced. In the 1960s it was realised that there were higher numbers of TB cases in people coming to the UK from countries with high rates of TB. At this point BCG vaccination was introduced for babies born in the UK to parents from countries with high rates of TB. Vaccination of all children aged 10-14 continued until 2005, when it was decided that TB rates in the general population had fallen to such a low level that universal BCG vaccination was no longer needed. The UK programme now targets babies and children who are most at risk of exposure to TB, with the aim of preventing the more serious childhood forms of TB, Data related to the impact of BCG vaccine on TB

Total number of children under five years

500 000 000

Estimated number of tuberculous meningitis cases, assuming that the annual risk of

M tuberculosis infection is 1 % 127, and that

1 % of infected under-fives contracts tuberculous meningitis⁹⁶.

50 000

Estimated number of tuberculous meningitis cases prevented, assuming:

(a) 100% BCG coverage and

(b) 80% protection:

40 000

i.e. approximately 12 500 vaccinations to

prevent one case of TB meningitis

Estimated number of tuberculous meningitis cases prevented, assuming:

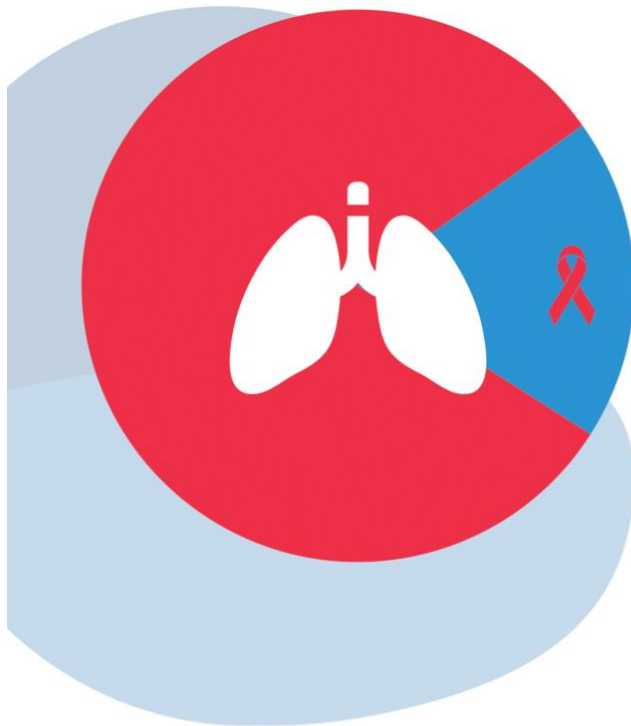
(a) 80% BCG coverage and

(b) 60% protection

24 000

i.e. approximately 16 667 vaccinations to
prevent one case of TB meningitis.

Tuberculosis is the top infectious killer in the world



IN 2018

1.5 MILLION*
PEOPLE DIED
FROM TB

INCLUDING
251 000 PEOPLE
WITH HIV

**TB is the leading killer of people
with HIV and a major cause of deaths
related to antimicrobial resistance**

*The 95% uncertainty intervals are 1.4-1.6 million for TB deaths and 223 000 - 281 000 for TB/HIV deaths.



- Conclusion

The UK needs to do more in the aspect of supervising the arrival of the people coming into the UK from the country where there are high rate of tuberculosis (TB) infection by checking if they have been vaccinated against tuberculosis (TB) disease

from point of destination and re- checking at the point of entry into the UK. The UK should follow the same procedure as anyone currently coming in to the UK from China must show valid negative Covid--19 vaccination certificate, the UK should use the same strategies to also monitor the people also coming in from a high (TB) infectious country, More-so, the UK needs to go beyond working in line with EU countries, the UK also have to apply the same method the US used in minimizing the rate of (TB) infection, as the record have shown that the (TB)infection rate have reduce drastically in the US.

Reference List

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