Public Health in the News

Scientists at the Eduardo Mondlane University in Maputo, Mozambique are training rats to identify TB-causing bacteria

The World Health Organisation (WHO) estimate that in 2009, tuberculosis (TB) "claimed about 1,7 million lives worldwide. Over 95% of TB deaths occur in low- and middle-income countries, and it is among the top five causes of death for women aged 15 to 44." Now, scientists at the Eduardo Mondlane University in Maputo in Mozambique, in association with the Anti-Personnel Landmines Detection Product Development (APOPO), are training rats to sniff out TB. Dr Emilio Valverde, the director at APOPO spoke to DESTINY MAN:

With appropriate training they can detect the explosives contained in landmines. We used the rats successfully in mine-clearing operations in different countries: Mozambique, Angola, Thailand, Vietnam, and Cambodia. After that, one of our founders, Bart Weetjens, started to think about the possibility of using the rats to detect TB. TB patients have a particular smell that even humans can detect in patients in advanced stages of the disease. Rats, of course, can detect it well before humans. We did some research in Tanzania and came out with a proof of principle: rats can identify TB in sputum samples, by detecting some volatile organic compounds produced by mycobacterium tuberculosis.

How important are your interventions in fighting the spread of TB in Southern Africa? Rats are a rapid, sensitive and cheap procedure to detect TB in large amounts of samples. They can evaluate 100 samples in less than 20 minutes, while a trained laboratory technician would take approximately four days to process a similar number of samples. Both in Tanzania and Mozambique, our rats increased TB detection rates in collaborating clinics by more than 40%. Since 2008, we've detected more than 8 000 cases of TB that were missed by the conventional microscopy performed in those clinics. Considering that a missed TB patient can spread the disease to 10 to 15 people per year, the number of beneficiaries from our technology is quite remarkable.

Have the rats uncovered multi-drug-resistant tuberculosis (MDR-TB) cases? We still have no data on MDR-TB. Of course, some of the cases detected by the rats were MDR, but we have no proof that rats are particularly sensitive to MDR-TB.

…Maternal mortality rate of pregnant women with TB and HIV is high, can the rats help to halve or stop such deaths? Yes, they can. As rats can detect TB more efficiently than microscopy, they could very well be used to screen pregnant women for TB.

The South African Medical Research Council recently unveiled a new rapid test machine that provides an accurate diagnosis in about 100 minutes, compared to previous tests that took three months. Why don't you invest in this new technology and retire the rats? The test you are referring to is the GeneXpert, a molecular biology-based test that is very sensitive and can detect TB and resistance to one of the first-line drugs used to treat it (rifampicin). The main issues with this test are the price, which is approximately $10 per sample, the need to have trained technicians to perform the test, and finally the need for a steady power supply. These three factors complicate the implementation of this technology in resource-limited countries like Mozambique and Tanzania. South Africa has a different economic status, but even so, rats are faster and cheaper than GeneXpert, and they could be used to make a first screening to select samples for confirmation with GeneXpert.

Source: Destiny Man, 15 September 2015

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