

# Preventing tuberculosis: Expectation, reality, hope

**T**uberculosis (TB) remains the world's top killer infectious disease. It is a bacterial infection caused by the *Mycobacterium tuberculosis* with the lungs being the primary site of infection. A quarter of the global population has TB, which caused some 1.7 million deaths in 2016.

As the world commemorated World Tuberculosis Day on March 24, sadly Indonesia is still listed as the world's second-largest TB-burdened country with an estimated 1 million active cases in 2015.

Active TB cases are people who become sick after being infected with the above bacteria. Interestingly, more than 90 percent of infected people do not develop the sickness, known as latent-TB infection. These people have immune systems that make the bacteria go into "silent" mode.

The bacteria can wake up later triggering a reactivation of the disease. The main clinical manifestation of active TB in adults is a prolonged cough. Coughing releases bacteria into the air and it spreads among people through inhalation, thus people living in a TB-burdened country have a high possibility of being exposed to the bacteria. Therefore, TB prevention in this country is more challenging.

Mass vaccinations are considered the most efficient public health intervention to prevent



**Heni Muflihah**  
BANDUNG

the development of the infectious disease.

In Indonesia, every newborn baby receives an injection of Bacille Calmette-Guérin (BCG), the only licensed vaccine for TB. The vaccine was developed almost a century ago and has been used worldwide since 1974.

Infant immunization with BCG is part of a national program to control TB in high burden countries. People expect every vaccine to work perfectly by protecting a vaccinated individual from the targeted disease. People also hope that one vaccination can prevent the disease for a lifetime. Unfortunately, children who have been vaccinated with BCG can be infected and develop TB years later. So why do we need to have a BCG vaccine?

The conclusion that BCG is useless seems attractive for the antivaccination campaign. But just because something is not working as we expected, it doesn't mean it is not needed. Here, BCG is still the best vaccine that we have to prevent and combat TB.

Many studies show that BCG prevents deadly TB-related diseases in children, in addition to

its low cost and safety. Pulmonary TB mainly affects lungs as a prolonged infection. TB can also appear in severe forms such as TB meningitis in the brain and miliary TB, which affects multiple organs. Children, who are not vaccinated with BCG, have a high risk of suffering these disseminated TB. This is the dangerous consequence of a massive antivaccination campaign in Indonesia.

The protective efficacy of BCG against pulmonary TB in adults is poor and varies widely in different countries. BCG can prevent the infection and progression of infection in some populations, but, not in others. Infant BCG immunization is maintained in high TB-burdened countries to prevent severe TB in children, the protective effect of BCG given shortly after birth is considered to have decreased. New active TB cases have increased in young people aged 14 to 19, with the highest being among those aged 20 to 30. However, as re-vaccination with BCG is considered ineffective in providing additional protection in some countries, it is generally not recommended. Therefore, we need a new and more protective vaccine for the long-term control of TB.

Over the last decade, researchers have been working on finding better vaccines for TB. A new vaccine is being formulated to replace BCG, to repair it, or to add to the anti-TB drug treatment,

depending on the construction of the vaccine and the induction of the immune response. The progress of the TB vaccine development has resulted in at least 12 candidates undergoing tests (clinical trials) at the moment. But it probably may not be ready for use in the next three years.

The long battle against TB needs more contributions from the community. Global TB control has resulted in a significant reduction in the annual number of deaths. However, the decrease in new cases is far from what is targeted. TB is curable with proper treatment. If infected people get diagnosed and treated early, the bacteria's spread can be curtailed. As community members, we need awareness about the early signs of TB, to seek an early detection for diagnosis, and to support the commitment to proper treatment. Efforts for prevention include a healthy lifestyle and provision of preventive treatment for anyone living in the same house with TB patients. Until a new and more effective vaccine is found, BCG remains the best option for preventing TB in children.

---

*The writer, a lecturer at the Coordination for Private Higher Education (Kopertis) Region IV Bandung, studied tuberculosis vaccine at the University of Sydney, Australia.*