

The potential of typhoid conjugate vaccines in Bangladesh

Typhoid, a serious enteric fever spread through contaminated food and water, is a substantial public health issue that disproportionately impacts children and marginalized populations in Asia and sub-Saharan Africa. The Global Burden of Disease (GBD) study estimates that, in 2019, there were more than 9 million typhoid cases and more than 110,000 typhoid deaths worldwide.¹ Additionally, strains of drug-resistant typhoid are spreading, causing global concern.²

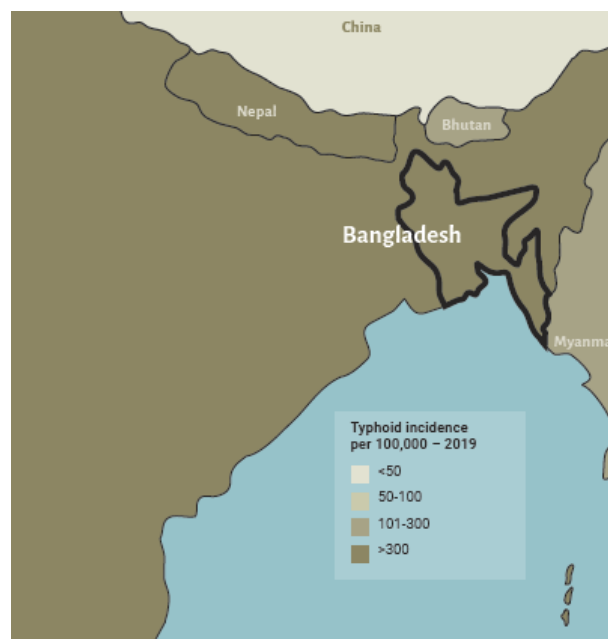
TYPHOID CONJUGATE VACCINES

Typhoid vaccination can reduce the need for antibiotics, slow expansion of drug-resistant strains, and save lives. Typhoid conjugate vaccines (TCVs) are licensed, prequalified by the World Health Organization (WHO), and have advantages over earlier typhoid vaccines. TCVs provide strong protection for at least 4 years, require only one dose, and are safe and effective for children older than 6 months of age.

Three large Phase 3 efficacy studies conducted in Nepal, Bangladesh,³ and Malawi showed that TCV prevented 79–85 percent of typhoid cases in children 9 months to 16 years of age. These results demonstrate that TCV is protective across diverse settings in Africa and Asia.

WHO RECOMMENDATION AND GAVI SUPPORT

In March 2018, WHO recommended TCVs as the preferred typhoid vaccine because of its improved performance and suitability for younger children. WHO recommends the introduction of TCV be prioritized in countries with the highest burden of typhoid disease or a high burden of drug-resistant typhoid. WHO encourages routine administration to be accompanied by catch-up vaccination campaigns for children up to 15 years of age, where feasible and supported by data. Gavi, the Vaccine Alliance has provided financial support for eligible countries to



According to GBD estimates, Bangladesh had 304 cases of typhoid per 100,000 population in 2019—one of the highest typhoid incidence rates in the world.

introduce TCVs since 2018. Several countries have already introduced TCV into their routine immunization programs including Liberia, Malawi, Nepal, Pakistan, Samoa, and Zimbabwe. More than 56 million children have been vaccinated with TCV globally.

AN OPPORTUNITY FOR BANGLADESH

TCVs could have a substantial benefit in Bangladesh, where the rate of typhoid is thought to be among the highest in the world. The GBD study estimates that, in 2019, Bangladesh had:

- **485,564 typhoid cases** or **304 cases per 100,000 population**, 59 percent of which were among children under 15 years of age; and
- **7,567 typhoid deaths**, 69 percent of which were among children under 15 years of age.¹



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Tybbar TCV® is a typhoid conjugate vaccine that was prequalified by the World Health Organization in December 2017.

The burden of typhoid may be even higher than GBD estimates. A surveillance study conducted in Dhaka found 1,135 cases of typhoid per 100,000 people.⁴

Typhoid also likely imposes an economic burden in Bangladesh. While a cost-of-illness study for Bangladesh is still underway, analyses from other settings in the south Asian region have found that average total costs for a hospitalized typhoid patient amounted to one-third of the average family's annual income.⁵ Findings from an economic analysis predict that, even in the absence of a Gavi subsidy, a catch-up campaign followed by routine immunization with TCVs could be cost-effective in Bangladesh.⁶



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A child receives a vaccine during the launch of the TyVAC effectiveness study in Bangladesh, March 2018.

REFERENCES

1. Institute for Health Metrics and Evaluation. Global Burden of Disease. 2019. Accessed via: ghdx.healthdata.org/gbd-results-tool.
2. Wong VK, Baker S, Pickard DJ, et al. Phylogeographical analysis of the dominant multidrug-resistant H58 clade of *Salmonella* Typhi identifies inter- and intracontinental transmission events. *Nature Genetics*. 2015;47(6):632-639.
3. Qadri F, Khanam F, Liu X, et al. Protection by vaccination of children against typhoid fever with a Vi-tetanus toxoid conjugate vaccine in urban Bangladesh: A cluster-randomised trial. *The Lancet*. 2021;398(10301):675-684.
4. Meiring JE, Shakya M, Khanam F, et al. Burden of enteric fever at three urban sites in Africa and Asia: a multicentre population-based study. *The Lancet Global Health*. 2021;9(12):E1688-E1696.
5. Kaljee LM, Pach A, Garrett D, et al. Social and economic burden associated with typhoid fever in Kathmandu and surrounding areas: A qualitative study. *The Journal of Infectious Diseases*. 2017;jix122.
6. Bilcke J, Antillón M, Pieters Z, et al. Cost-effectiveness of routine and campaign use of typhoid Vi-conjugate vaccine in Gavi-eligible countries: A modelling study. *The Lancet Infectious Diseases*. 2019; 19(7):728-739.

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