

## Potential of typhoid conjugate vaccines in India

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 2016, there were nearly 12 million typhoid cases and more than 128,000 typhoid deaths worldwide.<sup>1</sup> Additionally, strains of drug-resistant typhoid are spreading, causing global concern.<sup>2</sup>

### TYPHOID CONJUGATE VACCINES

Typhoid vaccination can reduce the need for antibiotics, slow expansion of drug-resistant strains, and save lives. Newly licensed and World Health Organization (WHO)-prequalified typhoid conjugate vaccines (TCVs) have several advantages over earlier typhoid vaccines. They:

- provide longer-lasting protection;
- require only one dose; and
- are suitable for young children over 6 months.

These qualities will allow better protection for younger children and expanded coverage through inclusion in routine childhood immunization programs.

### WHO RECOMMENDATION AND GAVI SUPPORT

In March 2018, WHO recommended that typhoid-endemic countries introduce prequalified TCVs into routine childhood immunization programs as a single dose for infants and children over 6 months of age, accompanied by catch-up vaccination campaigns for children up to 15 years of age, where feasible. Additionally, WHO recommended prioritizing countries with a high burden of disease and/or a growing burden of drug-resistant typhoid, and in response to confirmed typhoid outbreaks. Gavi, the Vaccine Alliance has earmarked US\$85 million to support the introduction of TCVs into routine immunization programs and is accepting applications for financial support, with introductions anticipated as soon as 2019.



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### AN OPPORTUNITY FOR INDIA

TCVs could have a substantial benefit in India, where typhoid is hyperendemic and inflicts a significant public health burden. The GBD estimates that, in 2016, India had:

- **6.6 million typhoid cases or 499 cases per 100,000 population**, 56 percent of which were among children under 15 years of age; and
- **66,439 typhoid deaths**, 56 percent of which were among children under 15 years of age.<sup>1</sup>

Typhoid also imposes an economic burden in India. A study in Kolkata, India, found that the total treatment costs per blood culture-confirmed typhoid hospitalization averaged US\$129, or 35 percent of average monthly household income.<sup>3</sup> An economic analysis predicted that routine TCV infant vaccination would potentially be very cost-effective and cost-saving in Kolkata and Delhi, respectively.<sup>4</sup>

### References

1. Global Burden of Disease. *The Lancet*. 2017.
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;47:632-639.
3. Poulos C, Riewpaiboon A, Stewart JF, et al. Cost of illness due to typhoid fever in five Asian countries. *Tropical Medicine & International Health*. 2011;16(3): 314-323.
4. Antillón M, Bilcke J, Paltiel AD, et al. Cost-effectiveness analysis of typhoid conjugate vaccines in five endemic low- and middle-income settings. *Vaccine*. 2017;35(27):3506-3514.

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