

## The potential of typhoid conjugate vaccines in Nepal

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

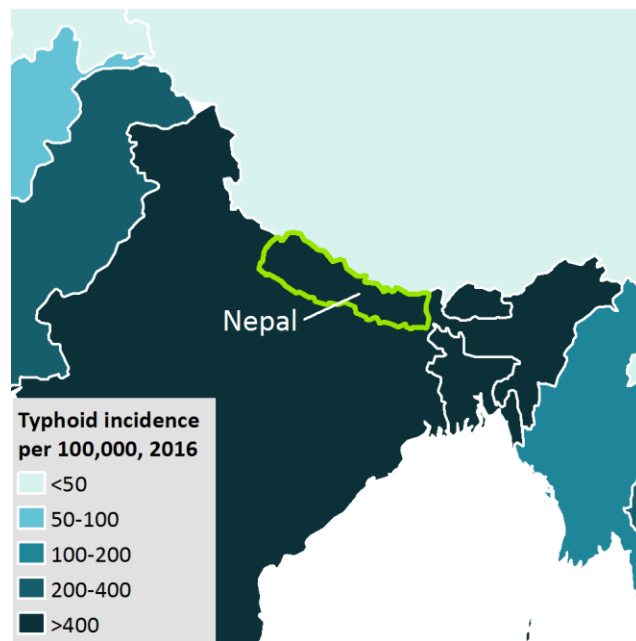
Typhoid vaccination can reduce the need for antibiotics, slow expansion of drug-resistant strains, and save lives. Newly licensed and World Health Organization (WHO)-prequalified typhoid conjugate vaccines (TCVs) have several advantages over earlier typhoid vaccines. They:

- 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 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.



According to GBD estimates, Nepal had a typhoid incidence rate of 436 cases per 100,000 population in 2016.

### AN OPPORTUNITY FOR NEPAL

TCVs could have a substantial health benefit in Nepal, where the rate of typhoid is among the highest in the world. The GBD estimates that, in 2016, Nepal had:

- **131,009 typhoid cases** or **436 cases per 100,000 population**, 61 percent of which were among children under 15 years of age; and
- **1,493 typhoid deaths**, 61 percent of which were among children under 15 years of age.<sup>1</sup>

Typhoid also imposes an economic burden in Nepal. One study in Kathmandu found that average total costs for a hospitalized typhoid patient were US\$233, one third of the average Nepali family's annual income.<sup>3</sup> Preliminary findings from an economic analysis predict that, even in the absence of a Gavi subsidy, a catch-up campaign followed by routine childhood immunization with TCVs would potentially be cost-effective in Nepal.<sup>4</sup>



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Typhar-TCV® typhoid conjugate vaccine was prequalified by the World Health Organization in December 2017.



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A child waits to receive a vaccine during the launch of the TyVAC effectiveness study in Nepal, November 2017.

## TyVAC EFFECTIVENESS STUDY IN NEPAL

In order to build evidence of the effectiveness of TCVs in protecting children from typhoid, researchers with the Typhoid Vaccine Acceleration Consortium (TyVAC) are conducting three different studies in Bangladesh, Malawi, and Nepal. In Nepal, TyVAC and project partners are studying how well TCVs prevent typhoid in children between 9 months and 15 years of age as well as the safety, impact, and cost of the vaccine. While the WHO already recommends TCV introduction in all typhoid-endemic countries, these studies add to the evidence base as low- and middle-income countries consider TCV vaccination strategies.

## 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(6):632-639.
3. 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.
4. Bilcke J, et al. Setting global performance standards for a cost-effective typhoid conjugate vaccine strategy: a modelling study. *In prep*.

Learn more and join the effort at [www.takeontyphoid.org](http://www.takeontyphoid.org).

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