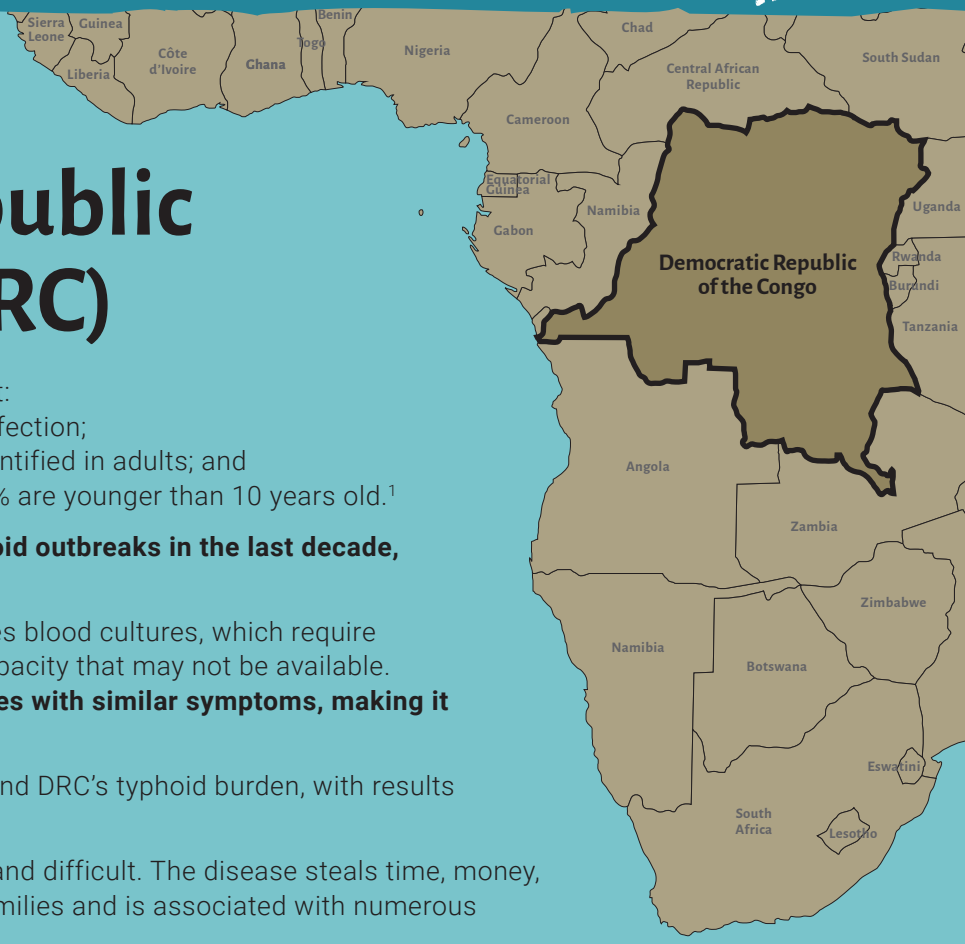

Burden of Typhoid in the

Democratic Republic of the Congo (DRC)

Hospital surveillance data from DRC indicate that:

- Typhoid is a frequent source of bloodstream infection;
- Is the most common bloodstream infection identified in adults; and
- Is frequently identified in children, of whom 72% are younger than 10 years old.[1]

DRC has experienced multiple large-scale typhoid outbreaks in the last decade, suggesting a growing typhoid burden.

Typhoid is difficult to diagnose because it requires blood cultures, which require specialized training to perform and laboratory capacity that may not be available. **Typhoid is often misdiagnosed for other diseases with similar symptoms, making it difficult to know its true burden.**

Additional studies are ongoing to better understand DRC's typhoid burden, with results expected soon.

While typhoid is rarely fatal, the recovery is long and difficult. The disease steals time, money, and productivity from those infected and their families and is associated with numerous long-term complications.

Photo © Megan Carey

Most typhoid cases in DRC occur in children **younger than 15 years old.**

Drug-resistant typhoid strains are a growing problem in DRC, regionally, and across the globe.

Global data show that multidrug-resistant (MDR) typhoid prevalence has **increased dramatically since 1992**.[2]

A study conducted in DRC found that **nearly half of the isolates tested were MDR.**[3] These samples were from outbreaks occurring between 2002 and 2014.

Another surveillance study found that 38% of isolates tested were MDR, and 25% had decreased ciprofloxacin susceptibility,[1] the preferred antibiotic treatment in the region. Together, **these studies demonstrate increasing drug-resistant typhoid in DRC**.

Drug-resistant typhoid is more difficult to treat and **forces the use of more expensive and less readily-available** treatment options.

Typhoid conjugate vaccines (TCVs) in DRC

The World Health Organization (WHO) recommends the introduction of prequalified TCVs be prioritized in countries with a high burden of typhoid disease or a high burden of drug-resistant typhoid. Support for introduction from Gavi, the Vaccine Alliance is available now. TCVs:

- Are highly effective and safe for children as young as **6 months** of age;
- Require a **single dose** to prevent 79-85% of typhoid cases in children;[4]
- Offer strong protection for **at least 4 years**; and
- Can be **co-administered with measles-rubella, yellow fever, and meningococcal A** vaccines.[5,6]

Findings from an economic analysis predict that, even in the absence of a Gavi subsidy, a catch-up campaign with TCV could be cost-effective in DRC.[7]

Photo: PATH/Georgina Goodwin

Let's Take on Typhoid in DRC

- Typhoid is a ***growing threat in DRC*** with increasing rates of drug-resistant typhoid, making cases more difficult to treat.
- DRC's burden of typhoid is most heavily borne by children ***younger than 15*** years of age.
- ***Climate change, urbanization, and increasing refugee populations*** are poised to add additional strains on water, sanitation, and hygiene infrastructure, thereby ***increasing the populations susceptible to typhoid***.
- ***TCVs*** are safe, effective, and WHO-recommended for routine immunization as part of a cost-effective, integrated approach to typhoid prevention and control alongside safe water, sanitation, and hygiene interventions.
- ***Gavi support*** for TCV introduction is available ***now***.

1. Tack B, Phoba MF, Van Puyvelde S, et al. *Salmonella* Typhi from blood cultures in the Democratic Republic of the Congo: A 10-year surveillance. *Clinical Infectious Diseases*. 2019;68(Suppl 2):130-137.
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. Kumelundu KK, Njoroge S, Ng'etich R, et al. Antimicrobial resistance profiles of *Salmonella enterica* subspecie enterica serovar Typhi isolates associates with typhoid fever epidemics in the Democratic Republic of the Congo, 2002-2014. *International Journal of Innovative Science and Research Technology*. 2018;3(11):117-124.
4. Patel PD, Patel P, Liang Y, et al. Safety and efficacy of a typhoid conjugate vaccine in Malawian children. *New England Journal of Medicine*. 2021;385(12):1104-1115.
5. Sirima SB, Ouedraogo A, Barry N, et al. Safety and immunogenicity of co-administration of meningococcal type A and measles-rubella vaccines with typhoid conjugate vaccine in children aged 15-23 months in Burkina Faso. *International Journal of Infectious Diseases*. 2021;102:517-526.
6. Sirima SB, Ouedraogo A, Barry N, et al. Safety and immunogenicity of Vi-typhoid conjugate vaccine co-administration with routine 9-month vaccination in Burkina Faso: A randomized controlled phase 2 trial. *International Journal of Infectious Diseases*. 2021;108:465-472.
7. 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. *Lancet Infectious Disease*. 2019;19(7):728-739.

TyVAC Typhoid Vaccine Acceleration Consortium
CENTER FOR VACCINE DEVELOPMENT • OXFORD VACCINE GROUP • PATH

COALITION AGAINST TYPHOID a program of the Sabin Vaccine Institute