

including multiplex PCR, bacterial and mycobacterial cultures, and Xpert MTB/RIF were negative. We suggested that cryptococcal antigenaemia with meningitis symptoms is most consistent with early cryptococcal meningitis.

Given the high prevalence of cryptococcal meningitis in Botswana and results from other studies,<sup>5</sup> culture-negative cryptococcosis might be an important contributor to undiagnosed meningitis. Better characterisation of these poorly described populations is warranted to inform better management and improve mortality.

We declare no competing interests.

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## Typhoid Vi-conjugate vaccine for outbreak control in Zimbabwe

Joe Bilcke and colleagues<sup>1</sup> investigated the cost-effectiveness of alternative delivery strategies for typhoid Vi-conjugate vaccine (TCV) in each of the 54 countries eligible for financial support from Gavi, the Vaccine Alliance.

In settings with a high incidence of *Salmonella enterica* serotype Typhi (STyphi), routine vaccination of infants and a catch-up campaign for children younger than 15 years seems to be a cost-effective approach and could reduce the number of typhoid cases in Zimbabwe by 68% over the next 10 years.

Zimbabwe carried out a mass TCV vaccination campaign in February to March, 2019, funded by Gavi, that targeted children aged between 6 months and 15 years in communities affected by an ongoing typhoid outbreak.<sup>2</sup> It was the first time TCV was used in Africa and the first vaccination campaign in response to a typhoid outbreak in the continent. Outbreaks of cholera and typhoid in Zimbabwe result from a lack of investment in and management of the country's water and sanitation infrastructure and health-care system.<sup>3</sup> Additionally, low availability of diagnostics and drugs, brain drain (emigration of highly qualified individuals from a country), prohibitive user fees in health facilities, and strikes by medical personnel have contributed to the most recent outbreak of typhoid.

FIEBRE, a multicountry study, has been enrolling adults and children who present with fever at health facilities in Harare, Zimbabwe, since June, 2018, to investigate the causes of fever in sub-Saharan Africa and southeast Asia. As part of the study, multiple diagnostic investigations have been done, including automated blood cultures, bacterial identification, and drug susceptibility testing. STyphi has been isolated from 23 (17%) of 133 blood cultures from children and 38 (21%) of 183 blood cultures from adults. Of the 61 STyphi isolates, 54 (89%) were multidrug resistant and 49 (80%) displayed diminished fluoroquinolone susceptibility.

3 months after the vaccination campaign, we observed a sharp decrease in one of the worst affected communities in the proportion of confirmed and suspected typhoid cases among children, but not among

adults. In this community, 23 (21%) of 109 blood cultures from children were positive for STyphi before vaccination compared with none of 24 after vaccination. By contrast, 18 (15%) of 117 blood cultures from adults were positive for STyphi before vaccination compared with 20 (30%) of 66 after vaccination.

Although the TCV vaccination campaign seems highly effective in reducing typhoid incidence among children, a more comprehensive approach—including vaccination of adults and water, sanitation, and hygiene interventions—will be needed to halt typhoid outbreaks.

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## Value of observational data for multidrug-resistant tuberculosis

In their Correspondence, Ibrahim Abubakar and colleagues<sup>1</sup> highlighted the crucial role of explanatory and

For more on FIEBRE see <https://www.lshtm.ac.uk/research/centres-projects-groups/fiebre>

For more on Gavi, the Vaccine Alliance see <https://www.gavi.org/>