

Leveraging the WHO-coordinated IB-VPD Surveillance Platform for Enteric Fever Surveillance: Lessons from Bangladesh

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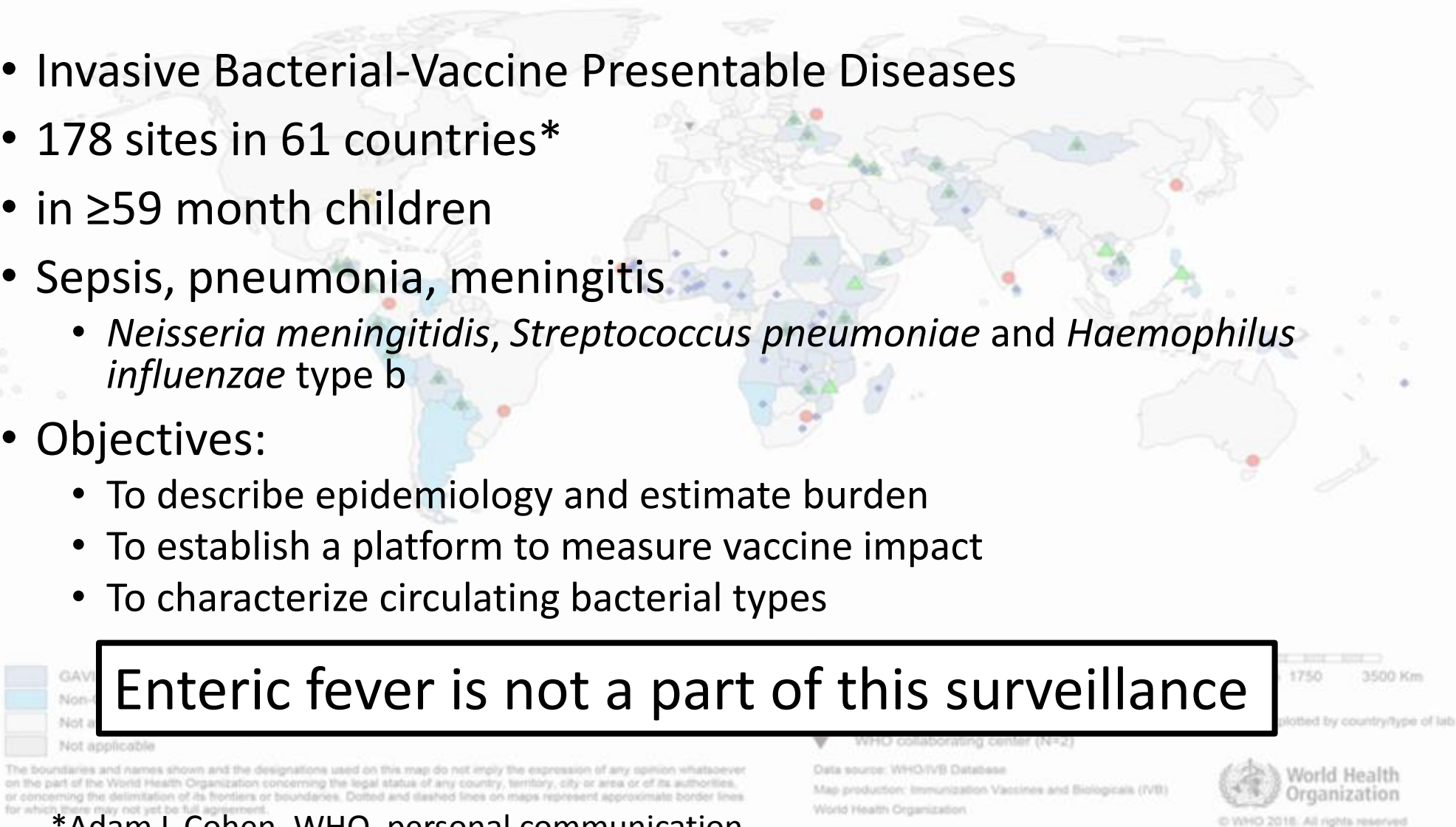
10th International Conference on Typhoid & other Salmonellosis

Lack of enteric fever surveillance systems in endemic countries

- Majority of data on enteric fever come from sporadic incidence studies
- Very few surveillance systems in place in endemic areas
- New and dedicated surveillance systems are
 - Expensive
 - Not sustainable

IB-VPD surveillance system of WHO

- Invasive Bacterial-Vaccine Preventable Diseases
- 178 sites in 61 countries*
- in ≥ 59 month children
- Sepsis, pneumonia, meningitis
 - *Neisseria meningitidis*, *Streptococcus pneumoniae* and *Haemophilus influenzae* type b
- Objectives:
 - To describe epidemiology and estimate burden
 - To establish a platform to measure vaccine impact
 - To characterize circulating bacterial types



Enteric fever is not a part of this surveillance

*Adam L Cohen, WHO, personal communication

Bangladesh operates high-performing sentinel sites

- Four sentinel sites
- Record of high quality laboratories
- Generate strong epidemiology data
- Facilitated introductions of Pneumococcal and Hib vaccines

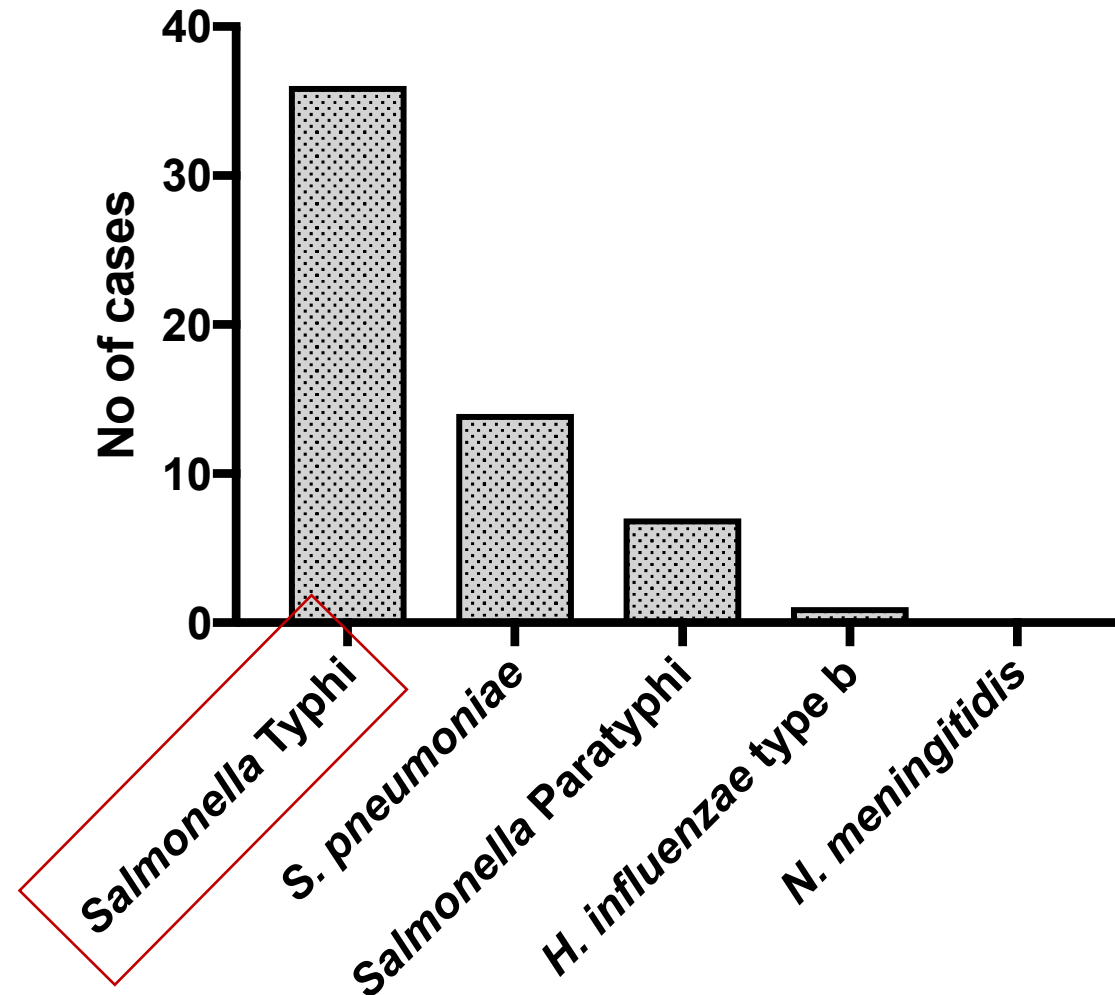
Bangladesh: A surveillance success story



WHO Global IB-VPD and Rotavirus Surveillance
Network Bulletin, 2016



The most frequently isolated from blood in the IB-VPD platform is Salmonella Typhi



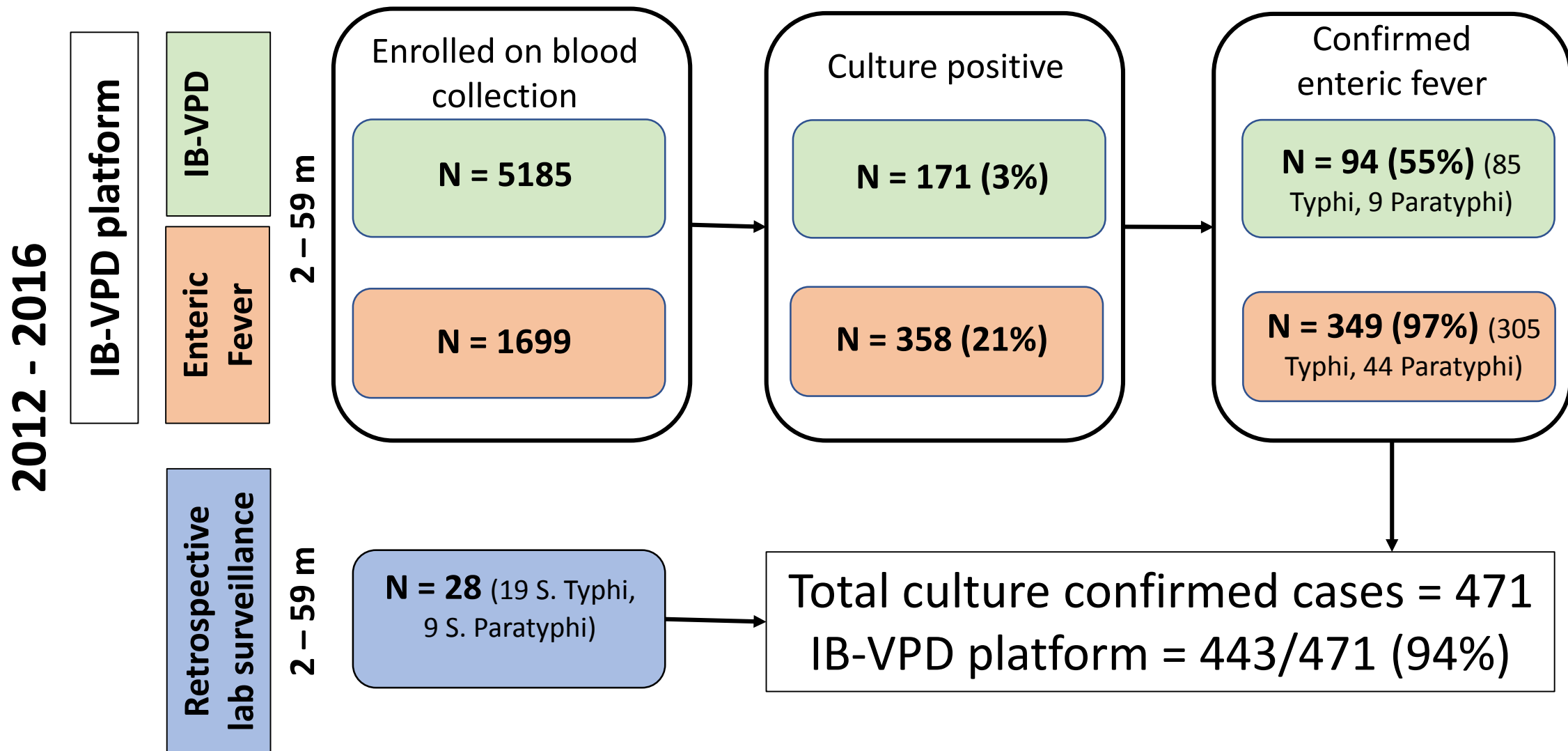
Can we leverage the ongoing IB-VPD platform
to surveil enteric fever?

Enteric fever surveillance on the IB-VPD platform

- Inclusion criteria:
 - Fever of ≥ 102 °F for ≥ 3 days
 - Eligible cases were enrolled on blood collection (**in-patient department**)
 - 2- 59m children
- Conducted in two urban sentinel hospitals, 2012 - 2016
 - Dhaka Shishu Hospital and Shishu Shasthya Foundation Hospital



Leveraging the IB-VPD platform for Enteric Fever Surveillance



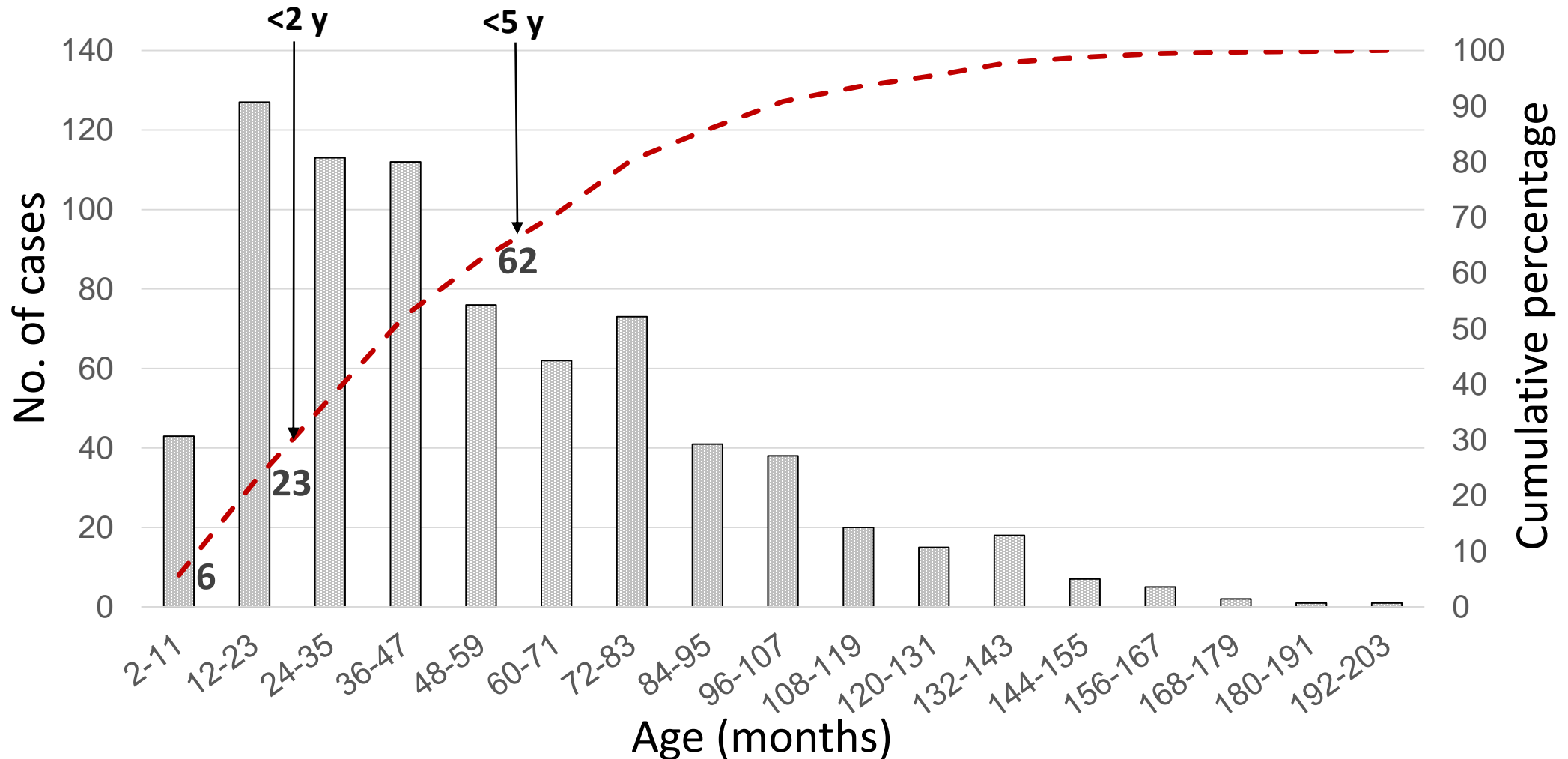
Enteric fever cases in children 0-18 years

- Additional retrospective laboratory surveillance revealed **283** cases in children >5 years

- Total culture confirmed enteric fever cases (2012-2016) = **754**
- Cases in 2 – 59 m = **471** (62%)
- Cases in >59 m = **283** (38%)

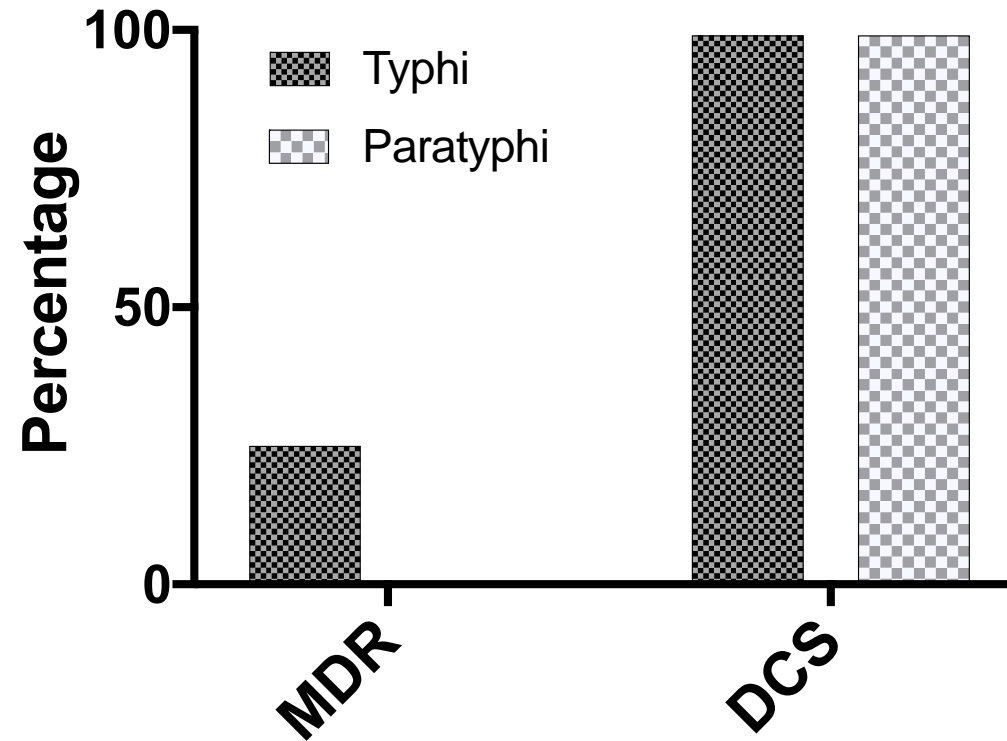
Additional cost required for the integration =
USD 44,974/year

23% of cases occur in children 12-23 months



Saha *et al*, 2001, Brooks *et al* 2005, Sinha *et al*, 1999

Antimicrobial susceptibility patterns are similar to other studies from the region




Multidrug resistance, **MDR**, = resistance to chloramphenicol, ampicillin
AND cotrimoxazole

DCS = Decreased Ciprofloxacin Susceptibility

Limitations and Future Directions

- The surveillance was done only in the in-patient departments
- The surveillance does not have a denominator and hence does not allow for incidence calculation



Contents lists available at [ScienceDirect](#)

Vaccine

journal homepage: www.elsevier.com/locate/vaccine




Review

Towards sustainable public health surveillance for enteric fever

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Take home message

- Ongoing IB-VPD platforms can be **sustainably leveraged** for monitoring enteric fever
 - To describe epidemiology and estimate burden
 - To characterize circulating bacterial types
 - To measure impact after vaccine introduction

With typhoid vaccine introductions in sight, we recommend that WHO expands its IB-VPD surveillance system to include enteric fever.

“From Evidence to Action”



Thank you

