Fifteen years of Surveillance for Invasive Salmonellosis in Bamako, Mali: 2002 to 2017

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27 March 2019

On behalf of:
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Background

- In 2017, Mali had the world's fifth highest under-five childhood mortality rate
- In 2001, the Center for Vaccine Development in Mali was established by the Ministry of Health and the University of Maryland School of Medicine
- One mission was to characterize the burden of vaccine-preventable infections and evaluate efficacy of novel vaccines

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Background

- Clinical microbiology laboratory established which allowed for surveillance of infections in children in Bamako, Mali
- Surveillance informed vaccine implementation
- Reported here is 15 years of surveillance data for pathogens causing serious invasive bacterial infections (SIBI), particularly nontyphoidal *Salmonella* (NTS)

Methodology

- Surveillance began on 1 June 2002 and is currently ongoing at l'Hôpital Gabriel Touré in Bamako, the primary pediatric hospital in Mali
- Inclusion criteria: residents of Bamako aged ≤ 15 years who were hospitalized with fever (≥ 39° C) and/or SIBI, including sepsis, pneumonia, and meningitis
- Cultures positive for NTS in blood (obtained from all children) and normally sterile body fluid (obtained at clinician's discretion) are reported herein

Results

- NTS identified in 460 (1.8%) of 26,198 enrolled pediatric inpatients
  - Accounted for 13% of pathogens isolated by culture
- *S.* Typhi identified in 100 patients
  - Accounted for 3% of pathogens isolated by culture

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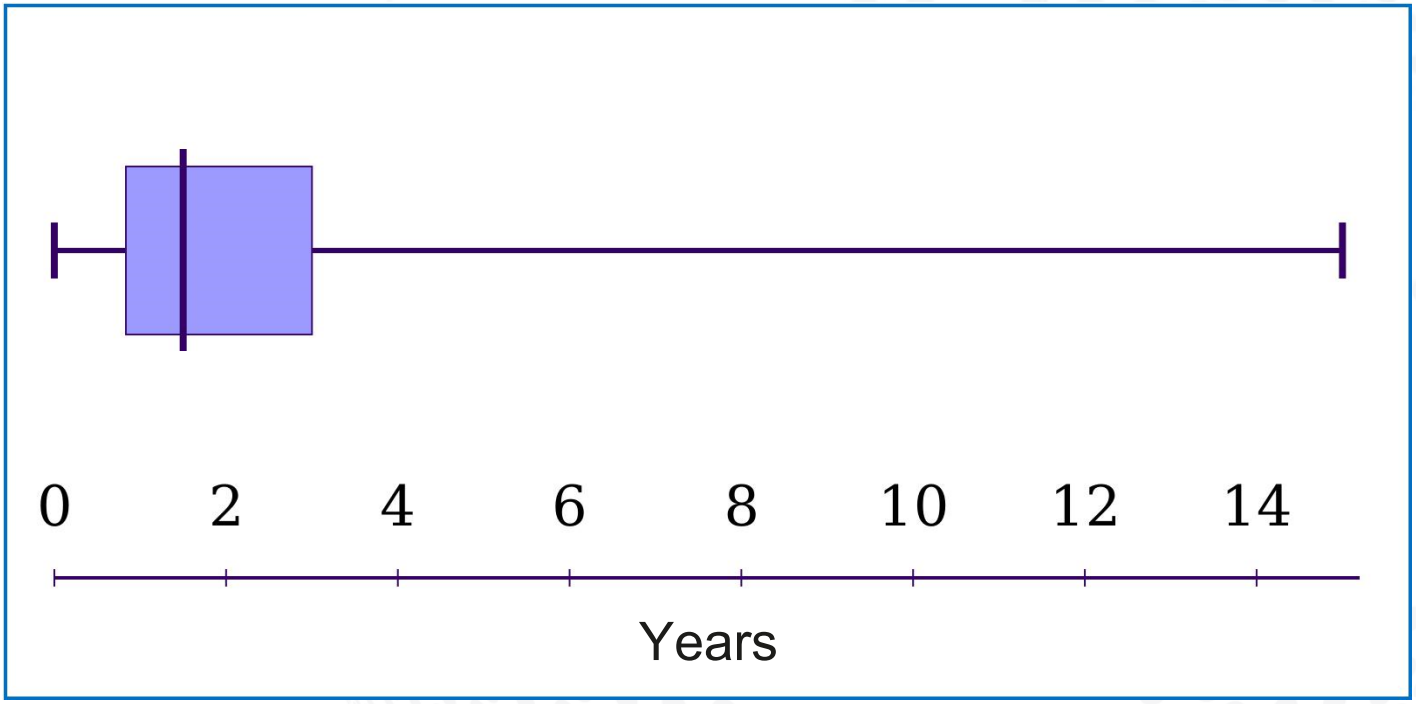
Age Distribution of NTS Cases



Median age of child with NTS: 1.5 years (sd: 3.1 years)

83% of NTS cases are <5 years of age

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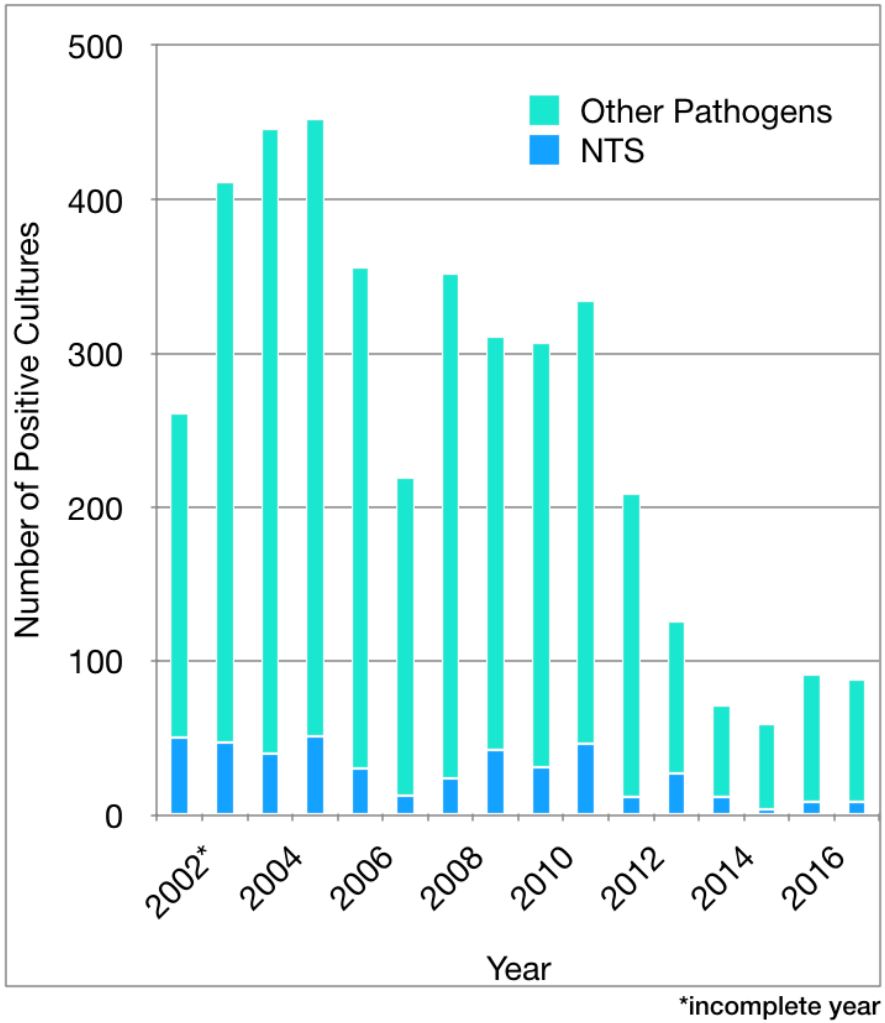
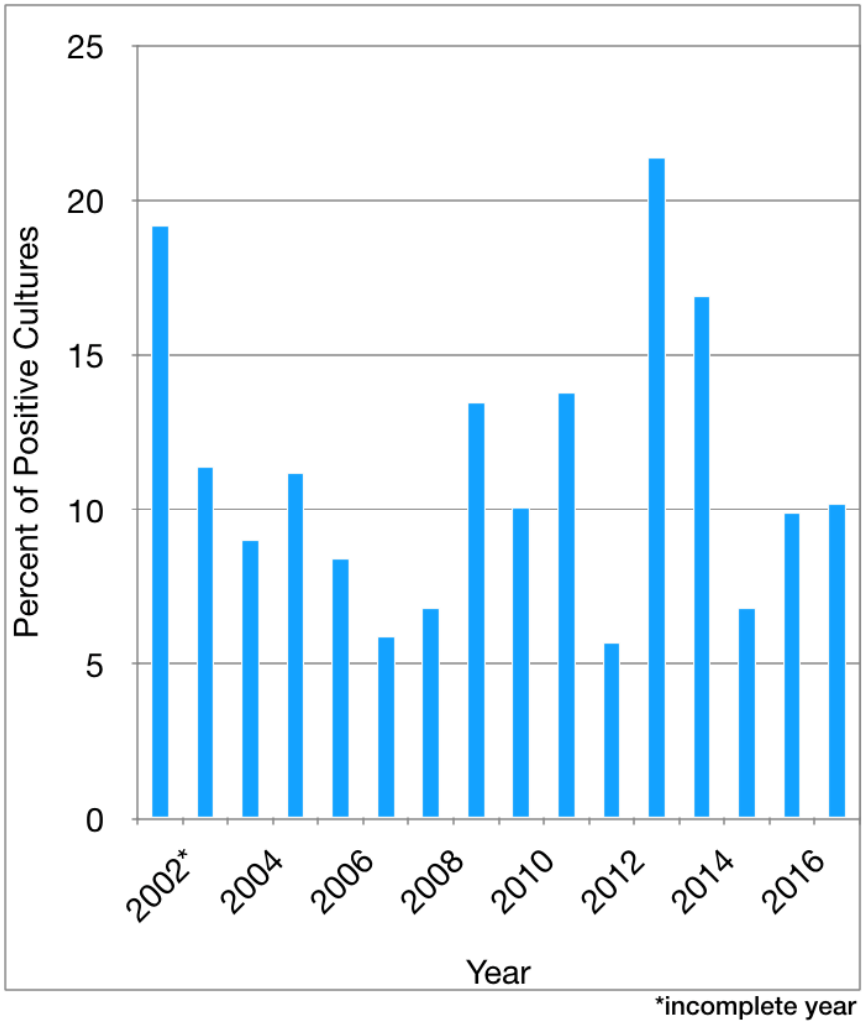
Number of Cultures Positive for NTS and Other Pathogens



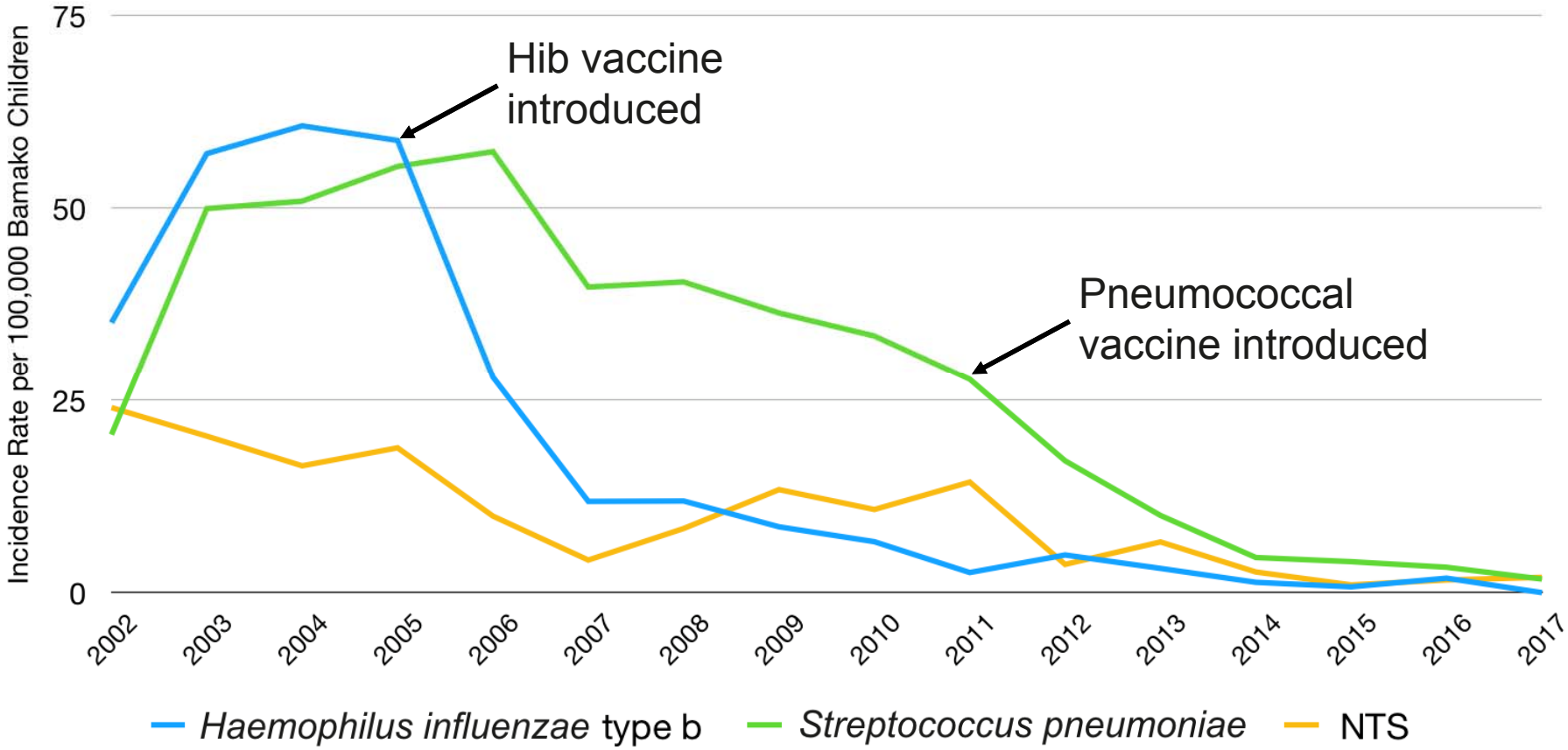
Proportion of Cultures Positive for NTS



Number of positive cultures has decreased over time

Proportion of cultures positive for NTS has not decreased

Under Five Incidence Rates of Top 3 Pathogens by Year

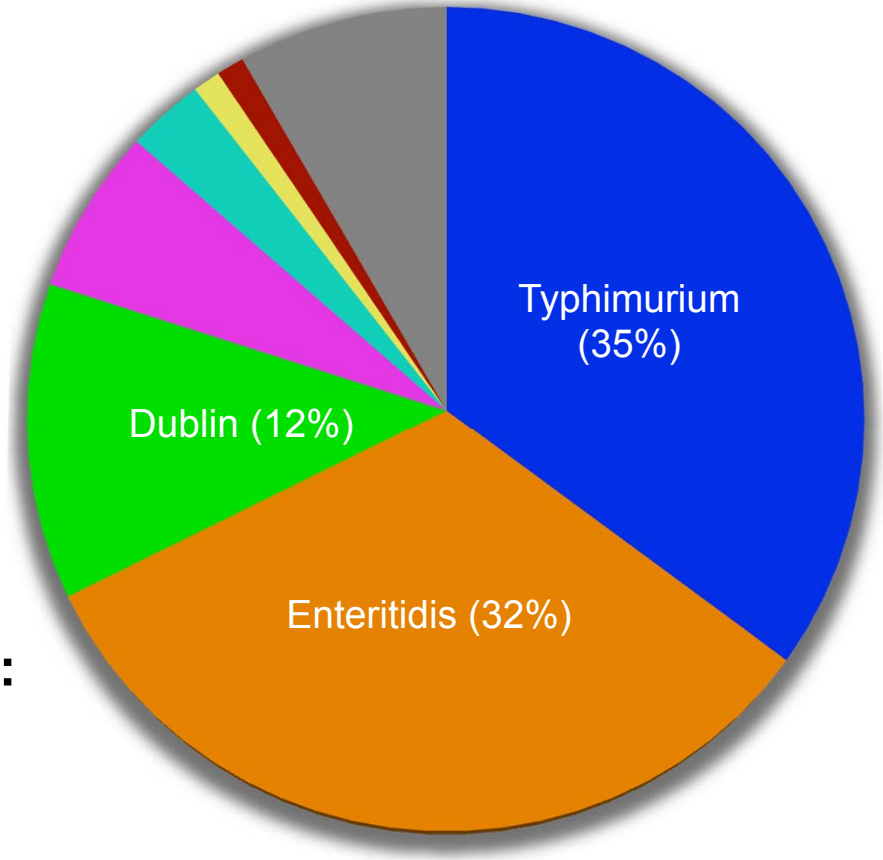


Introduction of Hib and Pneumococcal vaccines led to decreased incidence

NTS now the most common blood-borne infection observed in l'Hôpital Gabriel Touré

Breakdown of 460 NTS Serovars

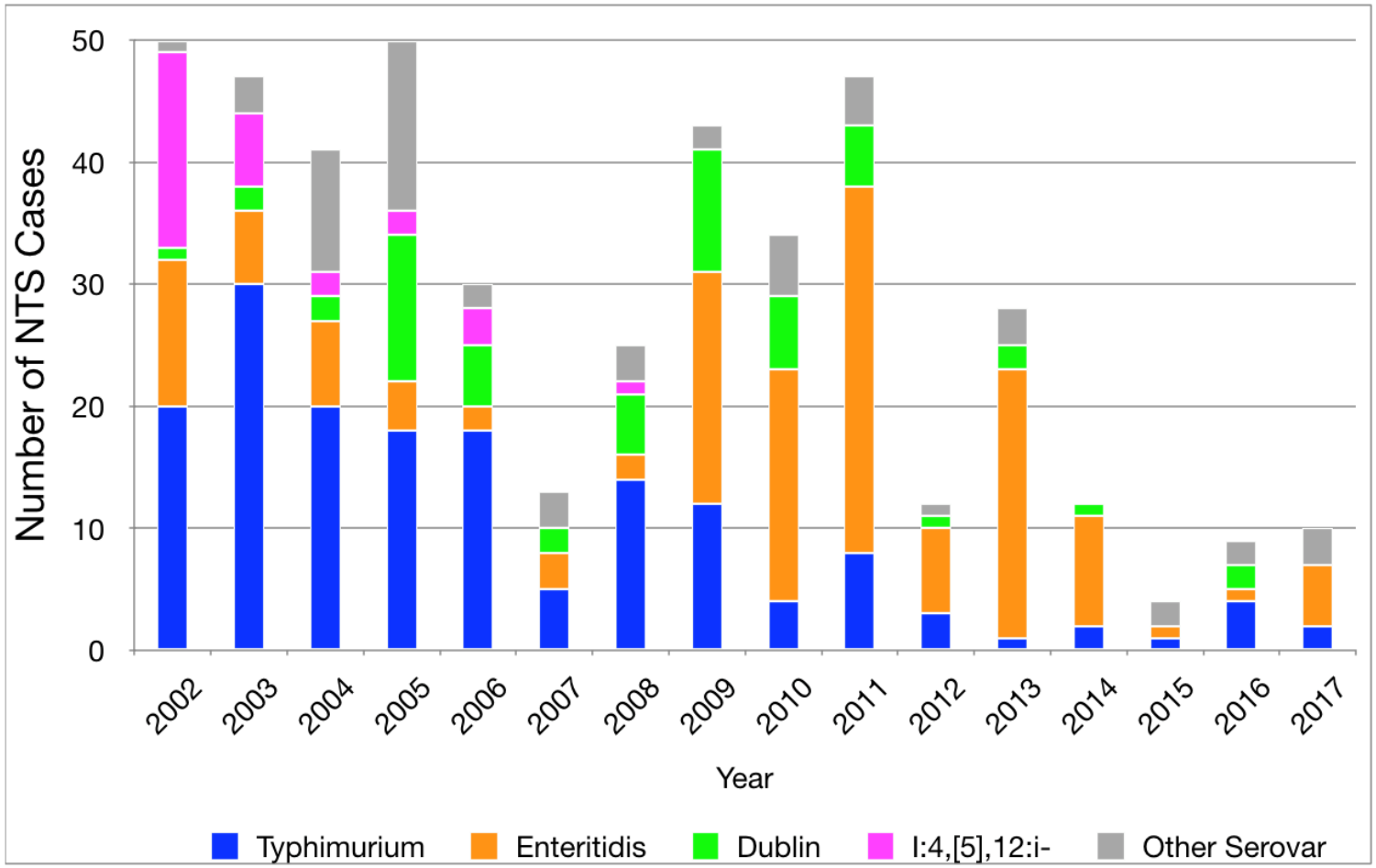
- Typhimurium (35%)
- Enteritidis (32%)
- Dublin (12%)
- I:4,[5],12:i:- (7%)
- Stanleyville (3%)
- I:4,[5],12:nonmotile (1%)
- Brazzaville (1%)
- Other Salmonella spp. (8%)



Four most prevalent serovars: Typhimurium, Enteritidis, Dublin, and I:4,[5],12:i:-

Accounted for 87% of all NTS isolates

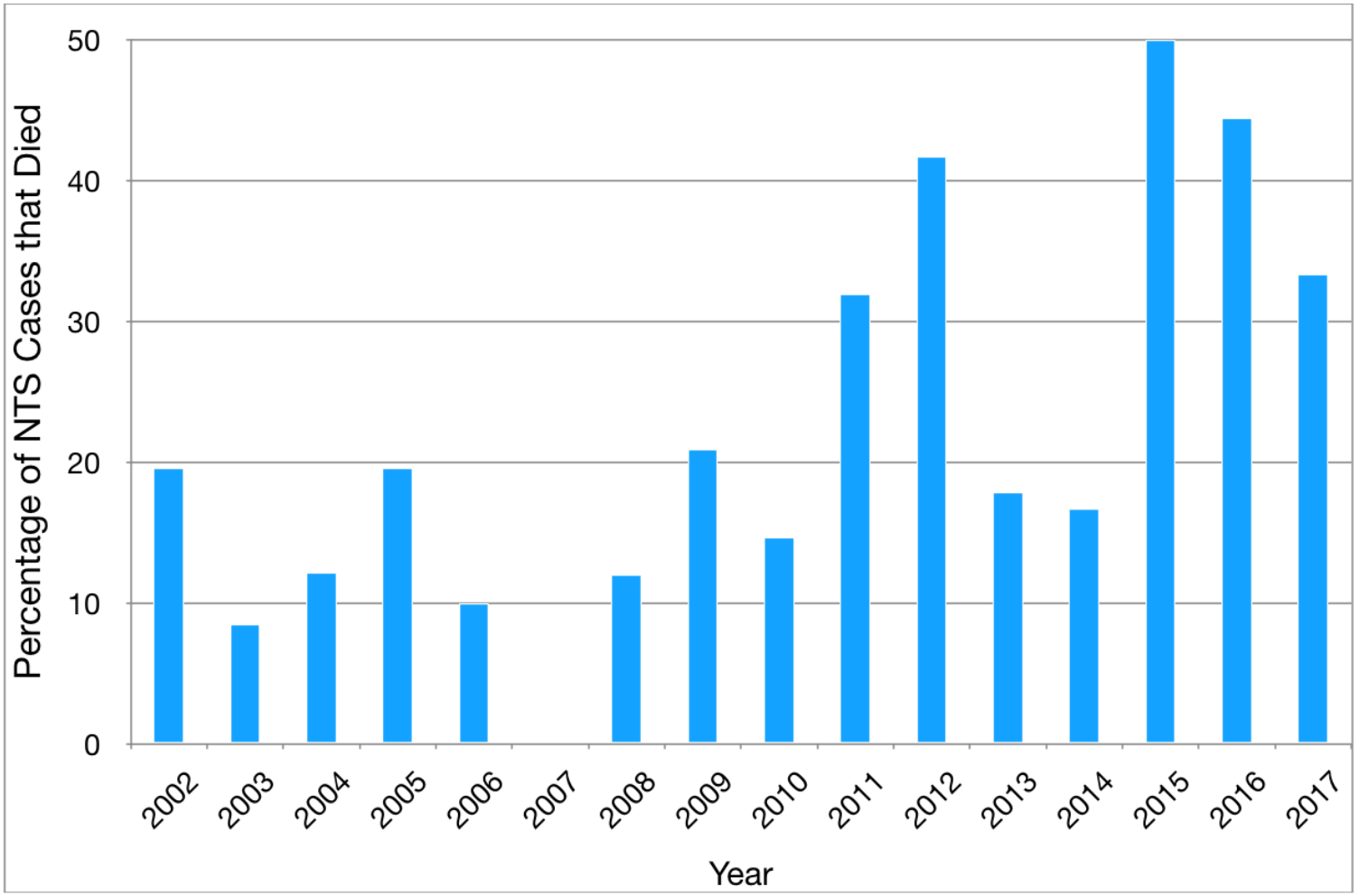
NTS Serovars Isolated by Year



Proportion of *S.* Enteritidis has increased

Proportion of *S.* Typhimurium has decreased

NTS Case Fatality by Year

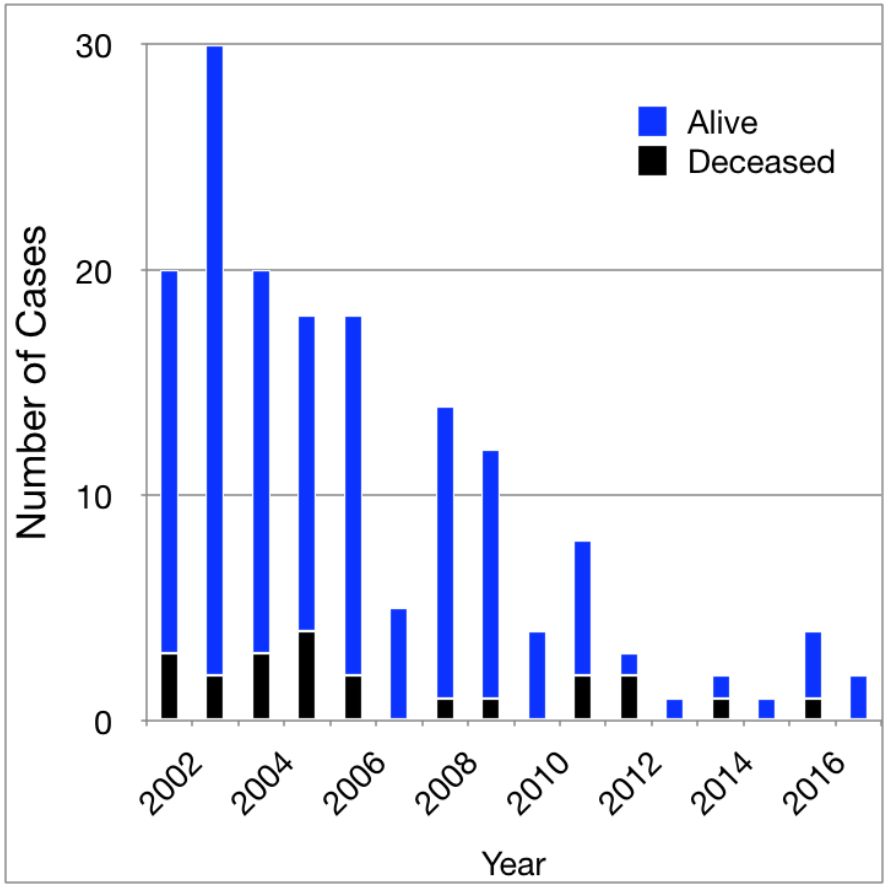


Overall case fatality: 19%

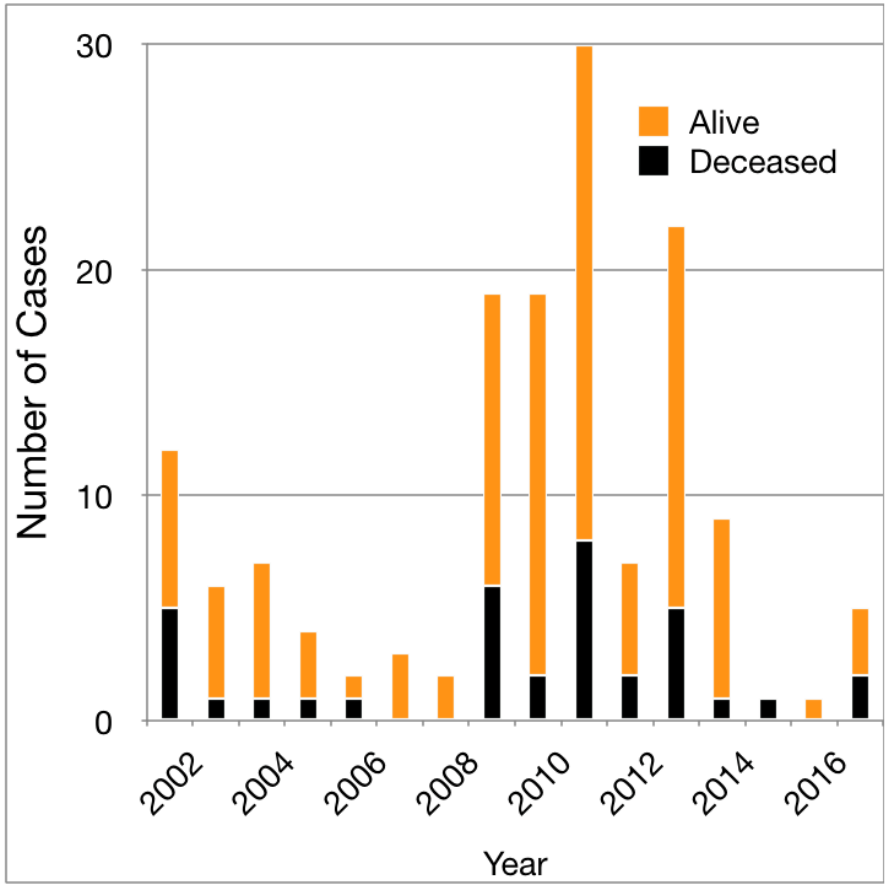
Small sample sizes contribute to year by year variability

Cases and Fatality by Year

S. Typhimurium



S. Enteritidis



Case fatality for *S.* Enteritidis (25%) significantly higher than all other serovars, including *S.* Typhimurium (13%) (p = 0.02)

Conclusions

- NTS remains major cause of serious invasive bacterial infection and mortality among hospitalized children in Bamako
- In contrast, *S.* Typhi remains uncommon in this setting
- Four serovars account for 87% of NTS cases
- Trends suggest decreasing incidence of NTS, however changes in healthcare utilization in Bamako may also play a role

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Acknowledgments

- Karen Kotloff
- Milagritos Tapia
- Sharon Tennant
- Myron Levine
- Mamadou Sylla
- Boubou Tamboura
- Aliou Touré
- Samba Sow

Travel is supported by the Typhoid Vaccine Acceleration Consortium (TyVAC), a grant from the Bill & Melinda Gates Foundation (OPP1151153)

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