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Age-specific incidence and associated mortality of invasive non-typhoidal Salmonella in Mozambican children, 2001 - 2019

**13th International Conference: Typhoid & other
invasive Salmonelloses**

Kigali, December 5th-7th, 2023

Inacio Mandomando

www.cismmanhica.org

TYPHOID & iNTS IN MOZAMBIQUE

- In 2017, it was estimated that approximately 500 000 cases of iNTS disease occurred, with the highest incidence in sub-Saharan Africa

GBD, 2019

- The development of iNTS vaccines and the introduction of S Typhi conjugate vaccines should be considered for high-incidence settings

- In Mozambique, iNTS are among the top two pathogens isolated in children with bacteremia

- However, data remain limited to few studies conducted in southern region

- The incidence of iNTS has been declining over the past years

- Updated data are needed to support vaccine introduction

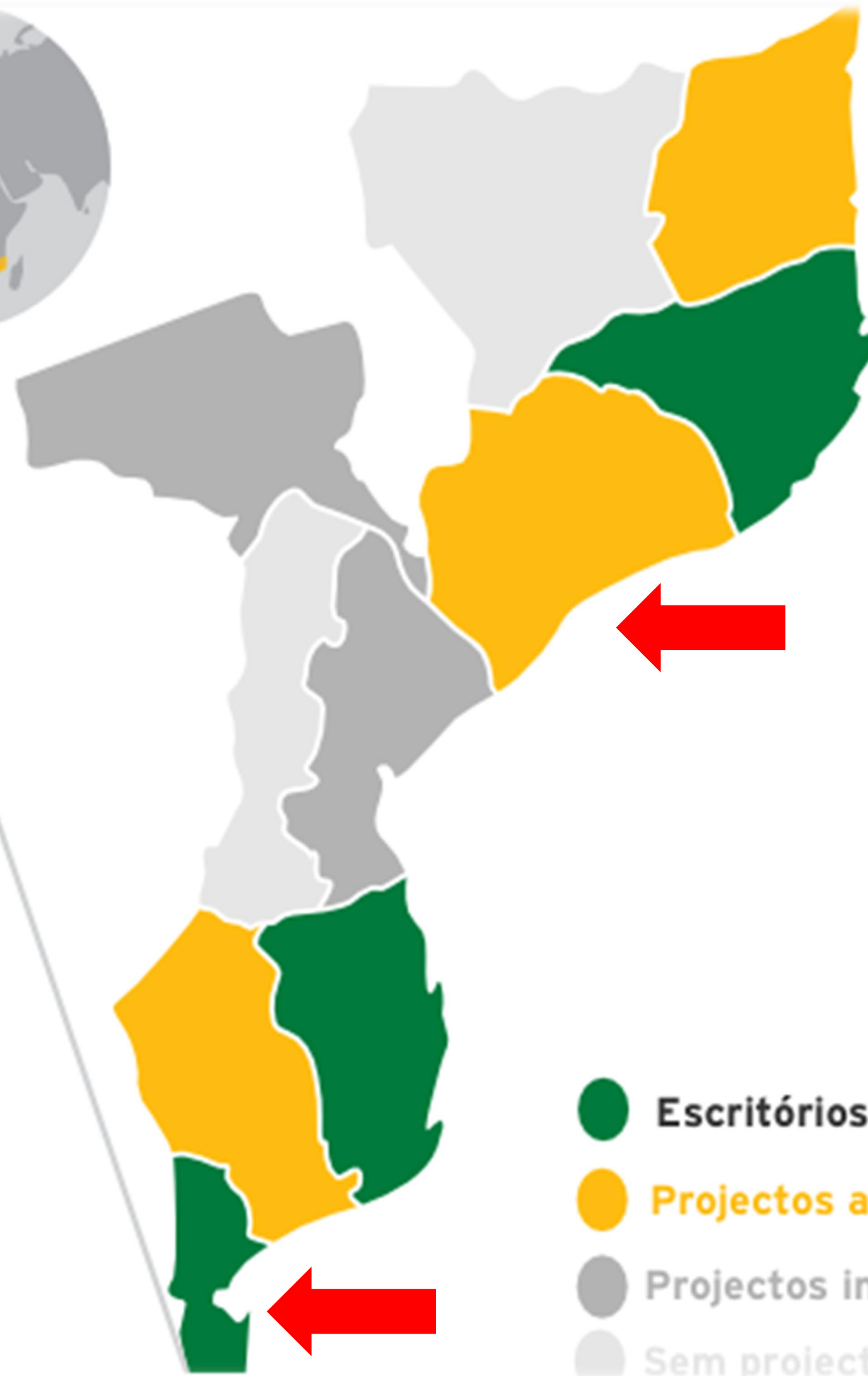
Sigauque et al, 2009

Mandomando et. al. 2009 & 2014

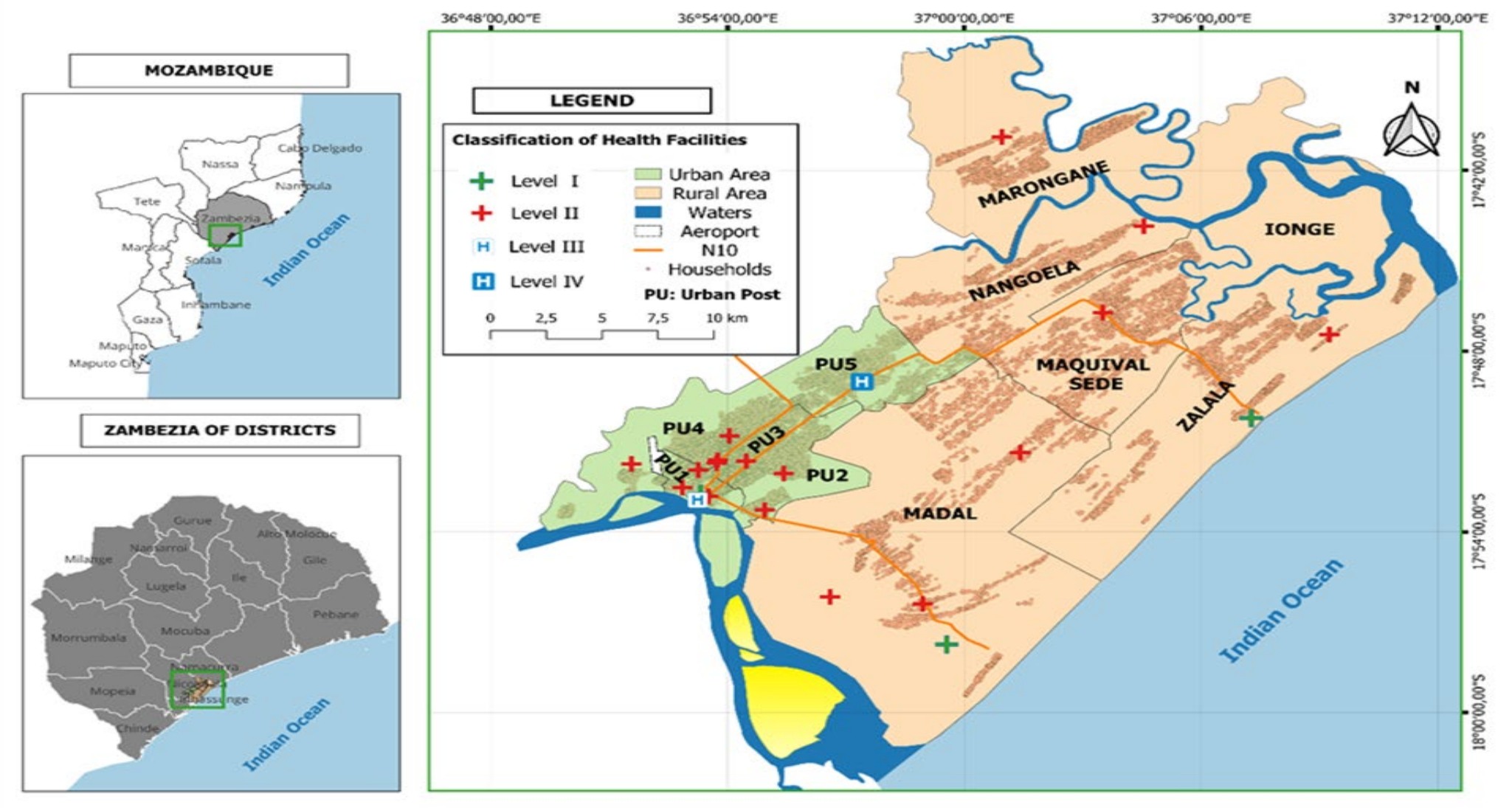
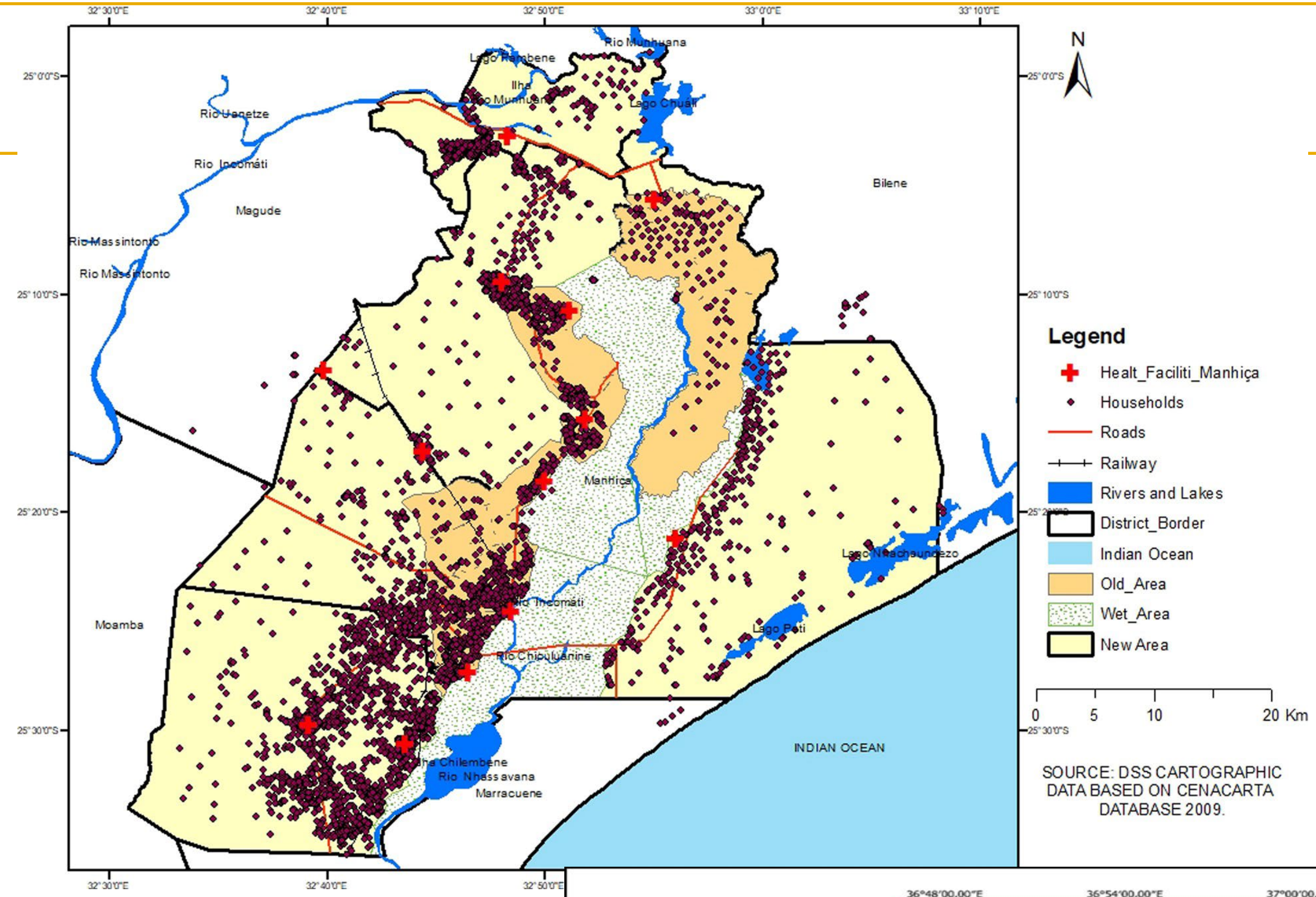
Preziosi, 2015

Moon, 2015

STUDY AREA & DSS



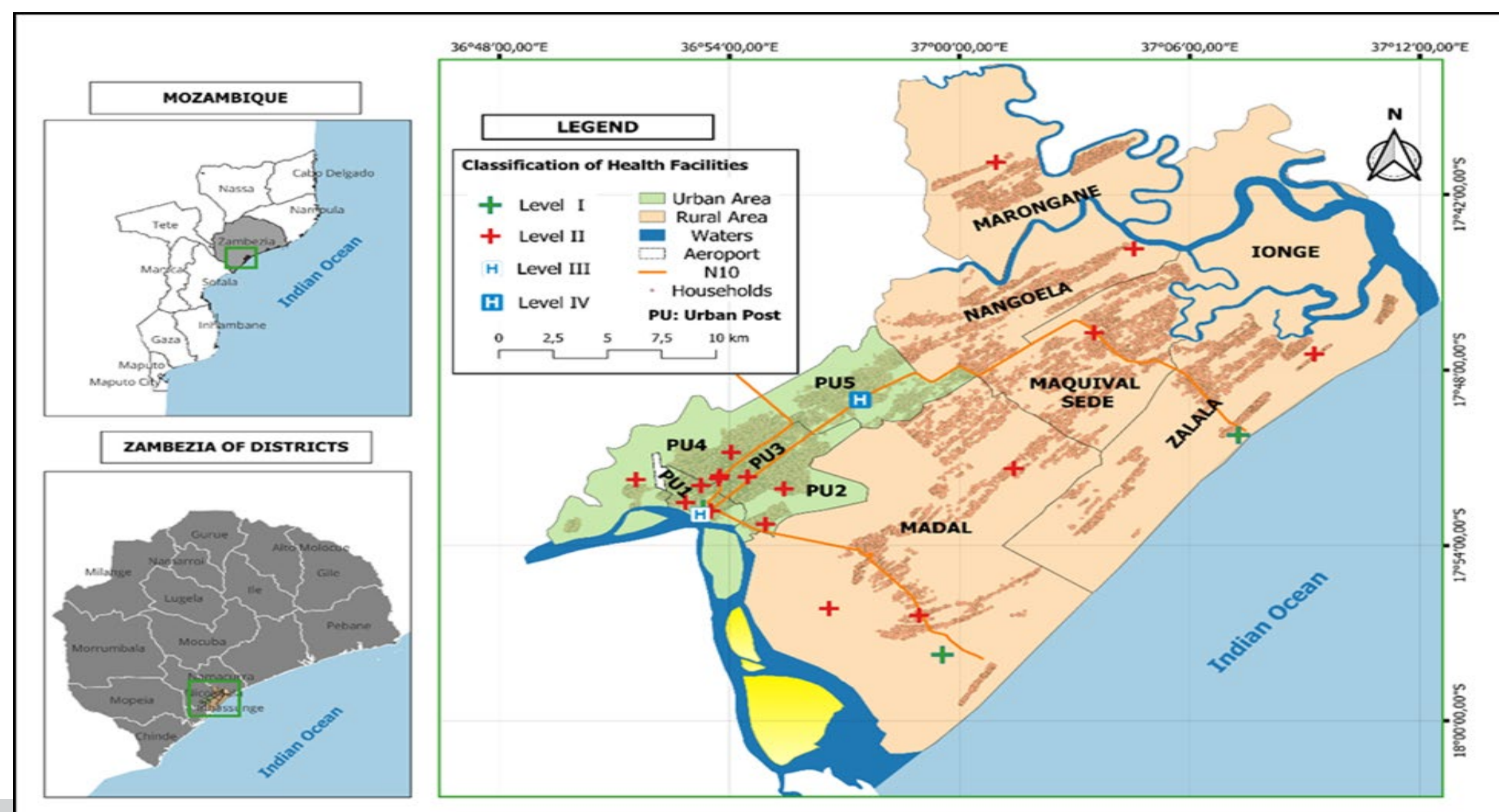
- Escritórios
- Projectos activos
- Projectos implementados
- Sem projectos



MORBIDITY SURVEILLANCE SYSTEM



- Monitor the outpatient and inpatient visits of children younger than 15 years
- Malaria screening in children with or referring fever
- Blood culture upon admission when meeting predefined criteria
- Clinical and epidemiological data
- Laboratory based confirmation
- Disease burden & incidence rates estimates



BACTERIAL CULTURE & ISOLATION



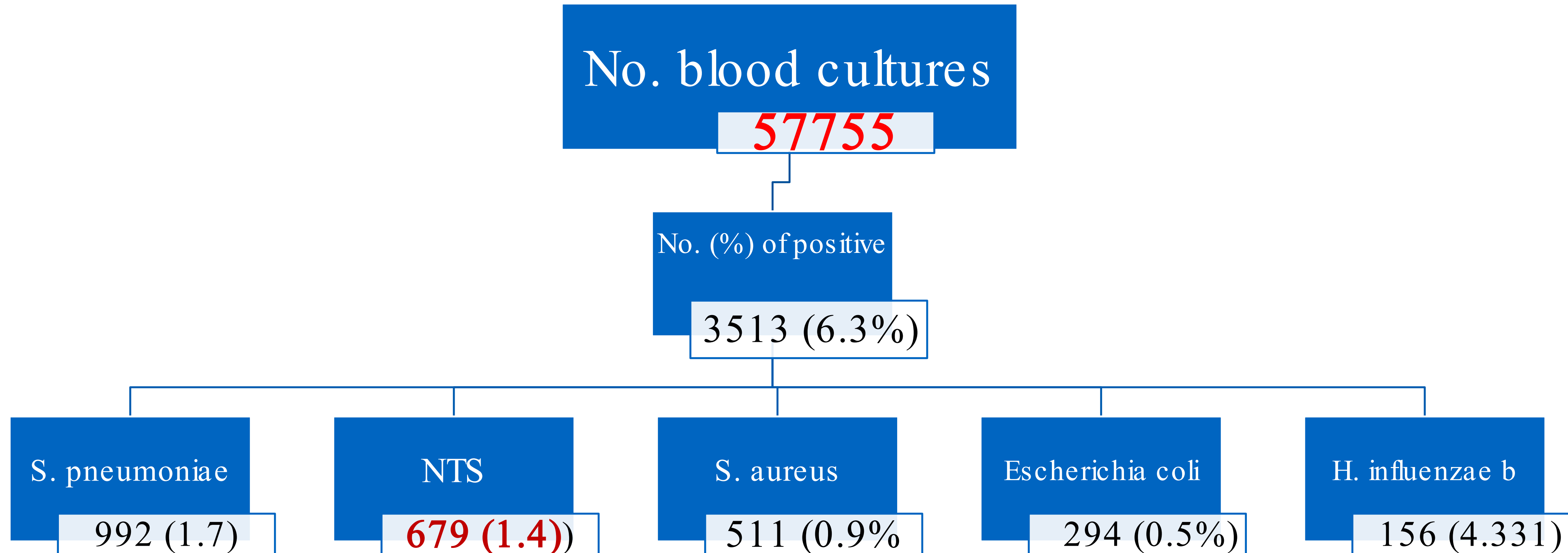
- Conventional microbiology & PCR
- Serogrouping / serotyping
- Antimicrobial susceptibility testing by disk diffusion (CLSI)

STATISTICAL ANALYSIS

- Age was stratified in small periods for a more detailed understanding of risks in the first months of life (0-28 days, 29 days-7 weeks; 8 - 15 weeks; 4, 5, 6, 7, 8, 9, 10, 11 months; 12-23 months; 24-59 months & 5-15 years)
- *Minimum community-based incidence rates of Salmonella bacteraemia and 95% CIs were calculated considering individual time at risk for children residing in the CISM study area excluding periods of migration. In calculating person-time, individuals were excluded during a lag period of 15 days after each episode of community-acquired bacteraemia*
- Negative binomial regression models were estimated to compare incidence rates.

KEY FINDINGS

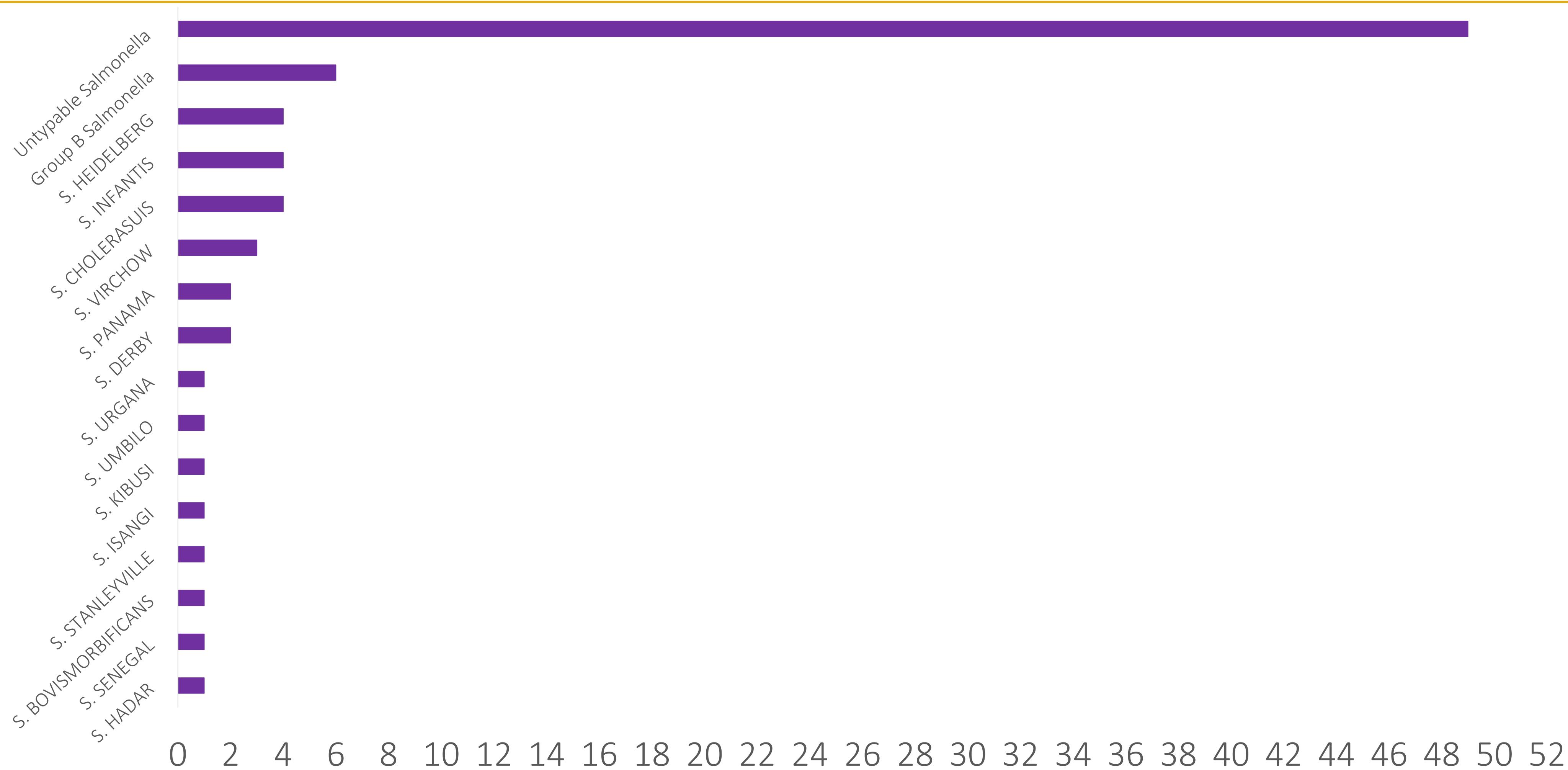
TRIAL PROFILE: JAN 2001 – DEC 2019



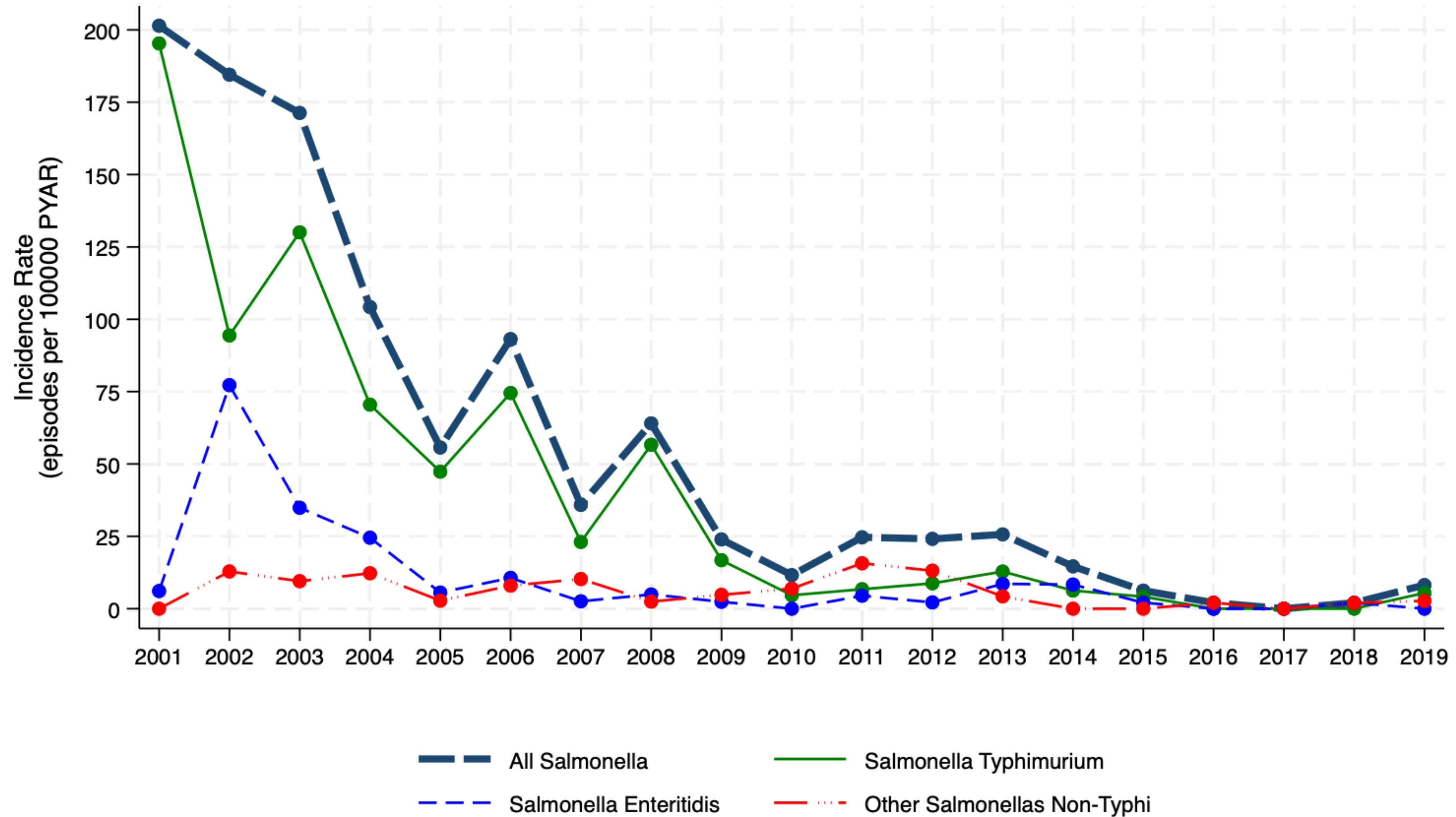
SALMONELLA ISOLATION IN MOZAMBICAN CHILDREN

<i>Salmonella</i>	No. isolates	(%)
<i>Salmonella</i> Typhimurium	458	(67.5)
<i>Salmonella</i> Enteritidis	138	(20.3)
Other iNTS serovars	83	(12.2)
Total	679	(100.0)

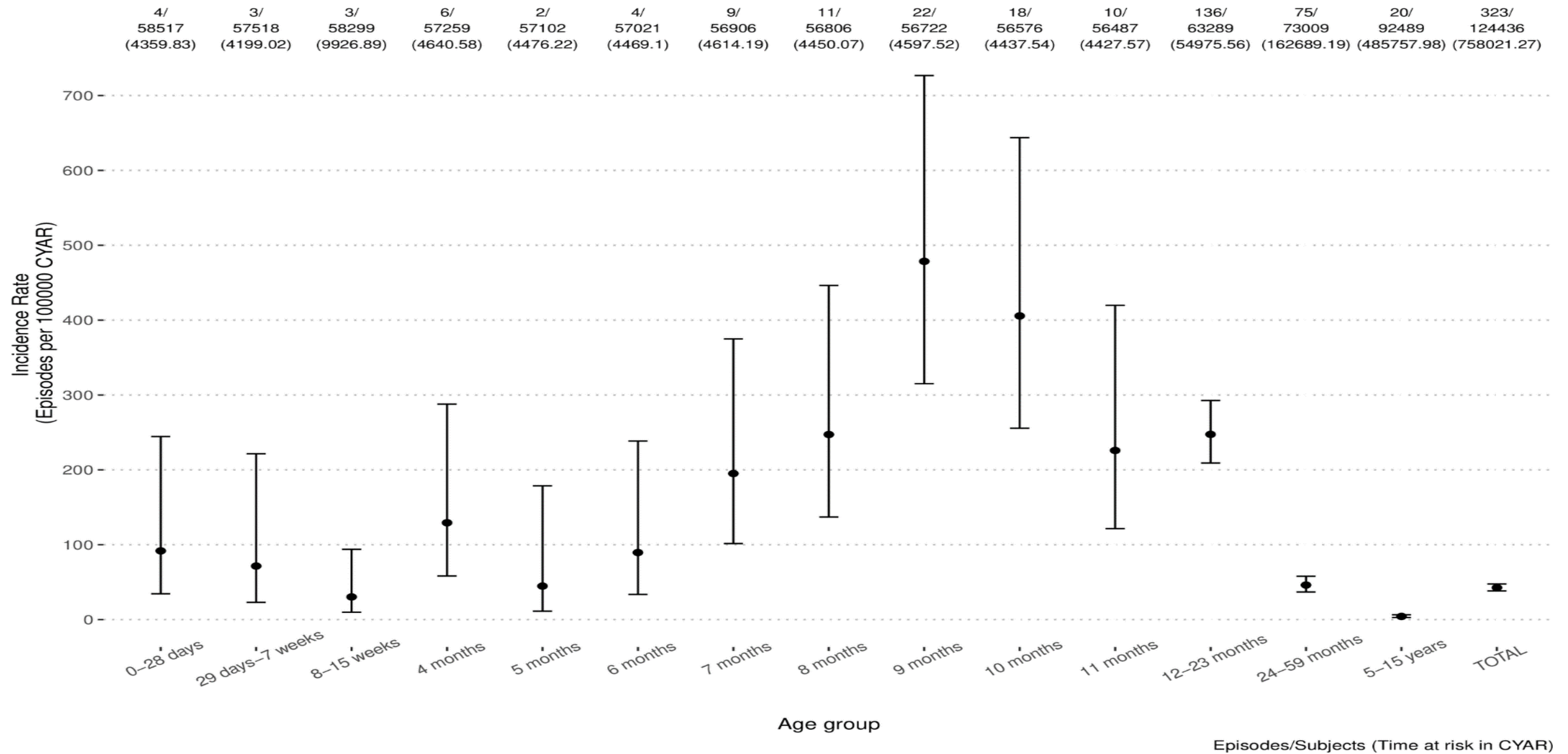
OTHER INTS SEROVARS ISOLATED



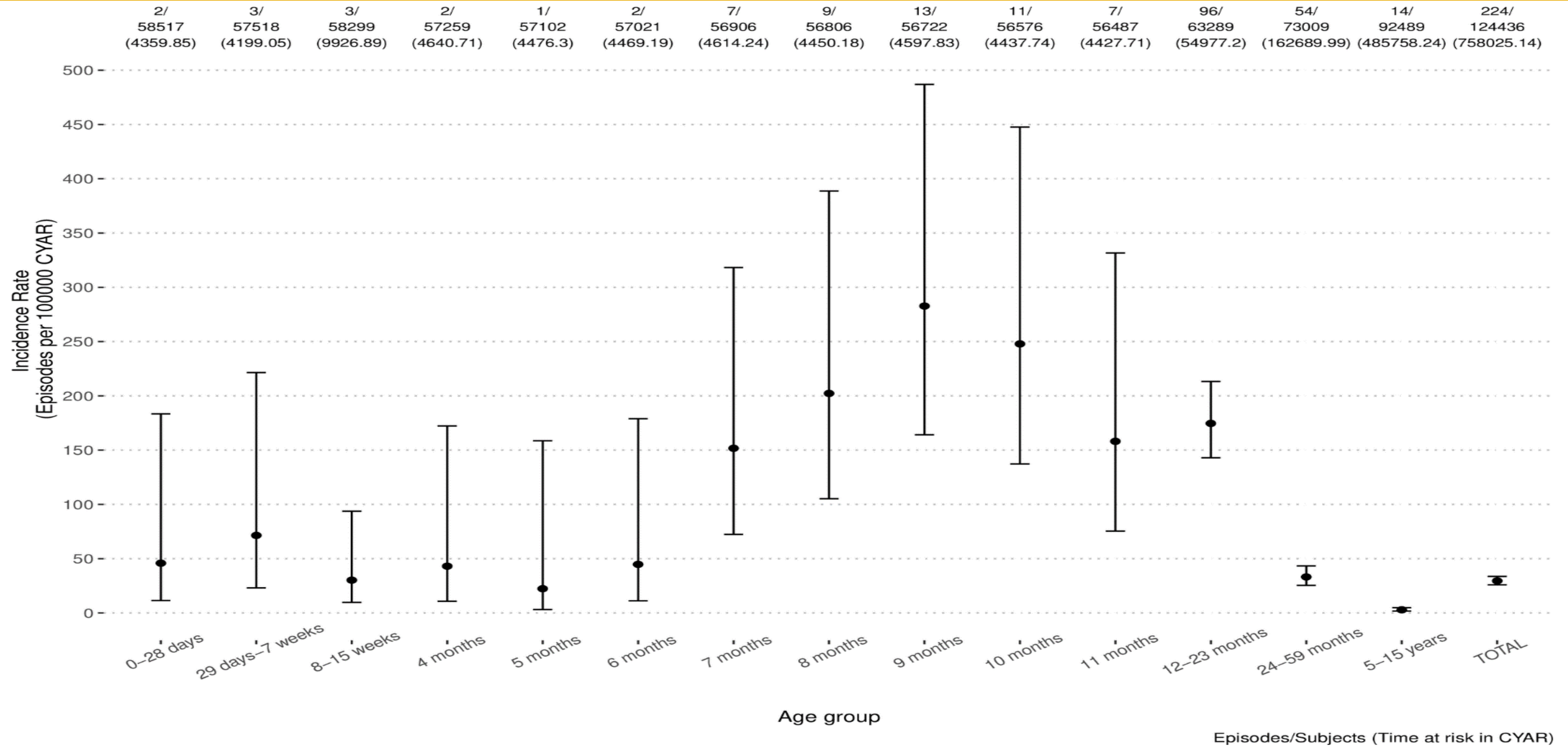
INCIDENCE RATES OF iNTS IN MOZAMBIKAN CHILDREN



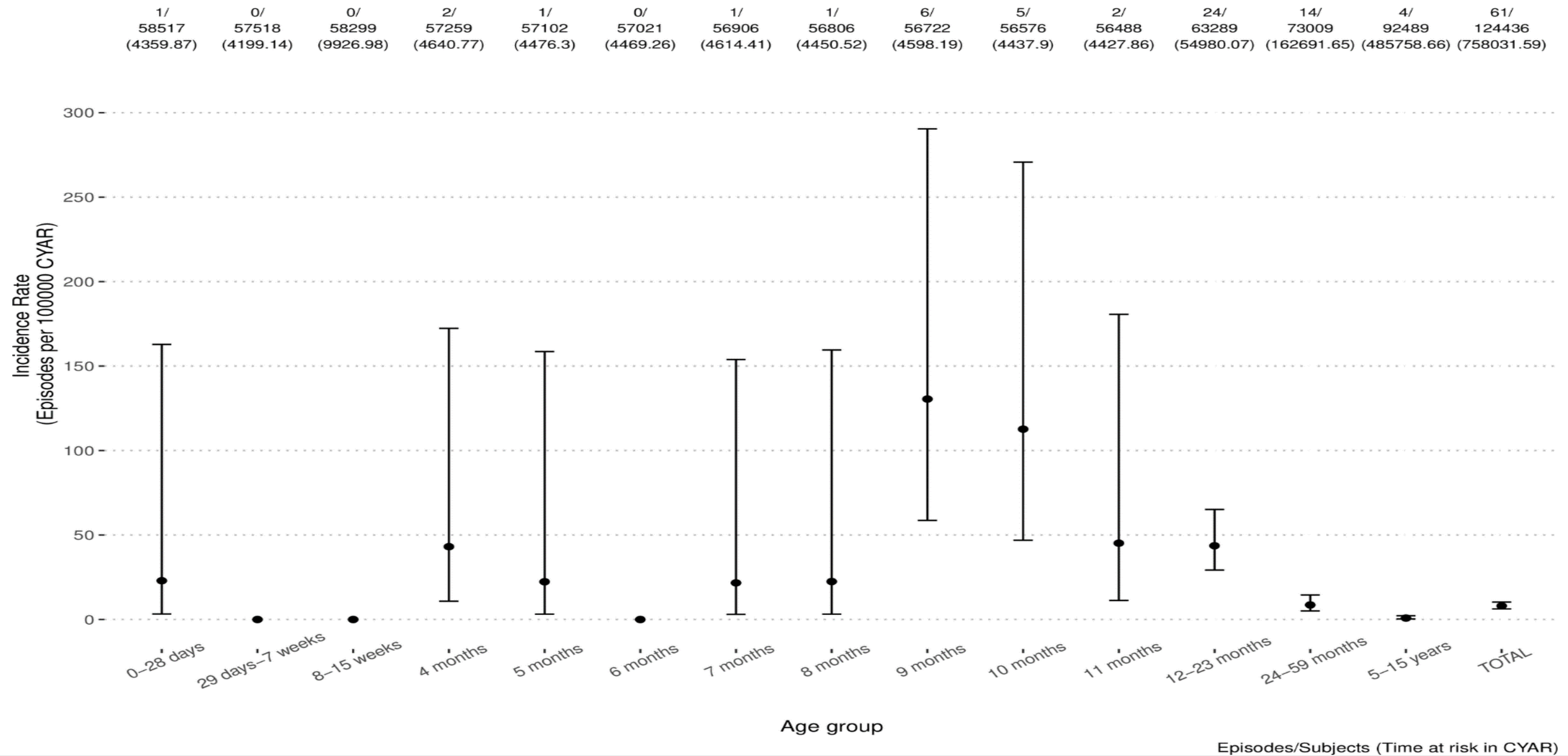
AGE-SPECIFIC INCIDENCE RATES: ALL *SALMONELLA*



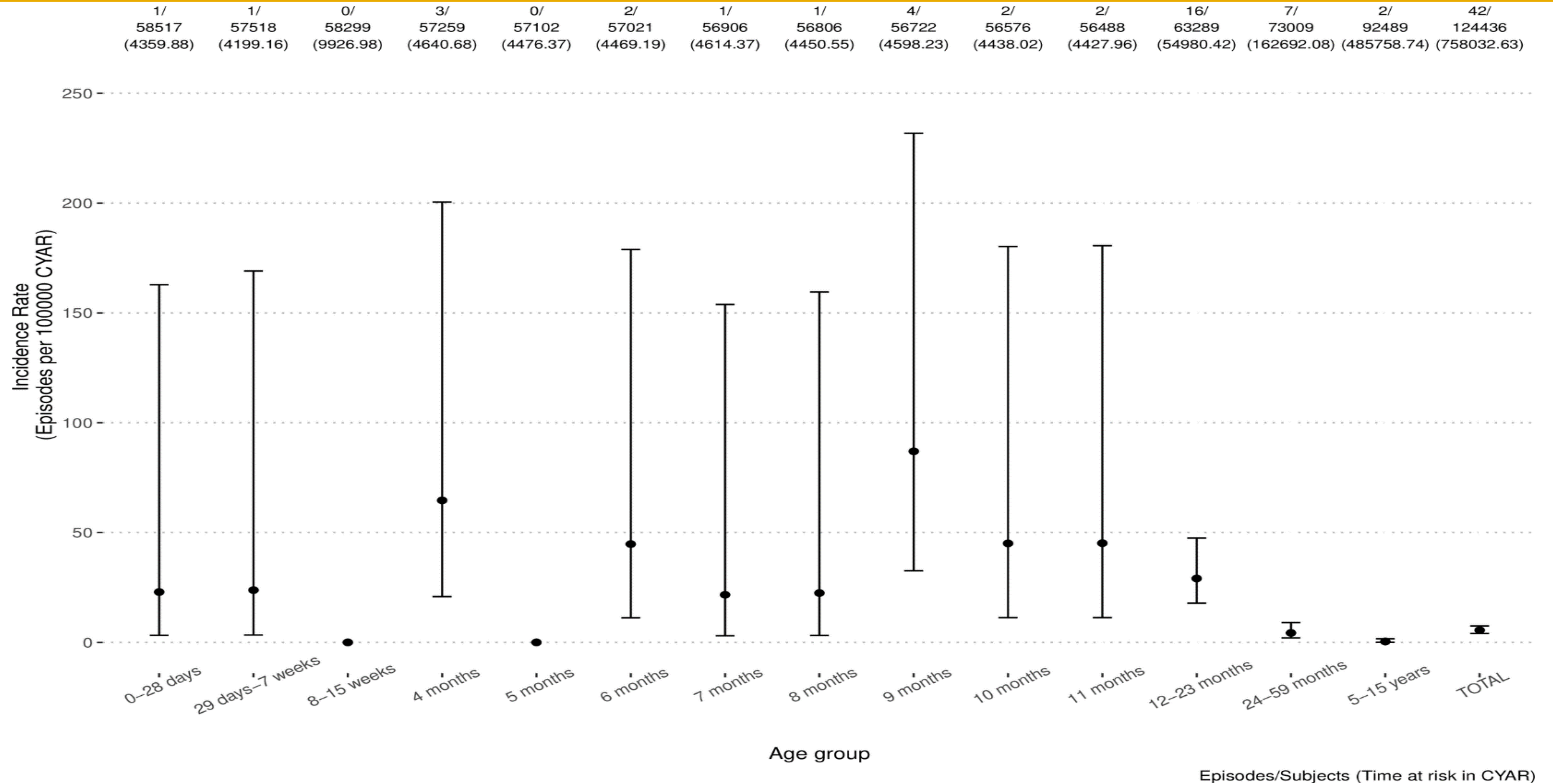
S. TYPHIMUIRUM INCIDENCE RATES BY AGE



S. ENTERITIDIS INCIDENCES RATE BY AGE

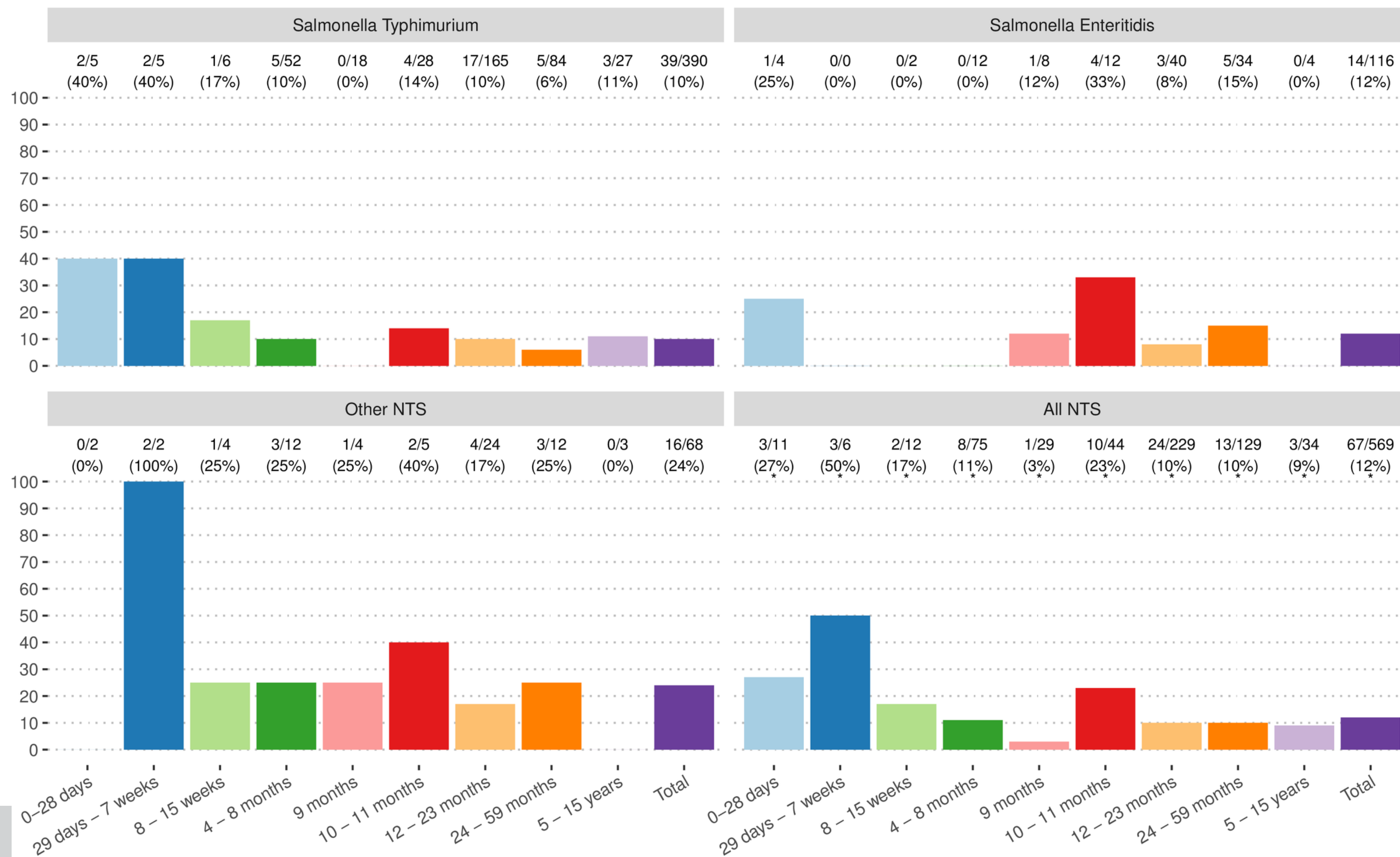


INCIDENCE RATES OF OTHER *S. SEROVAR* BY AGE GROUP



ASSOCIATED MORTALITY BY AGE AND SALMONELLA SEROVARS

Age group: 0-28 days, 29 days - 7 weeks, 8 - 15 weeks, 4 - 8 months, 9 months, 10 - 11 months, 12 - 23 months, 24 - 59 months, 5 - 15 years, Total

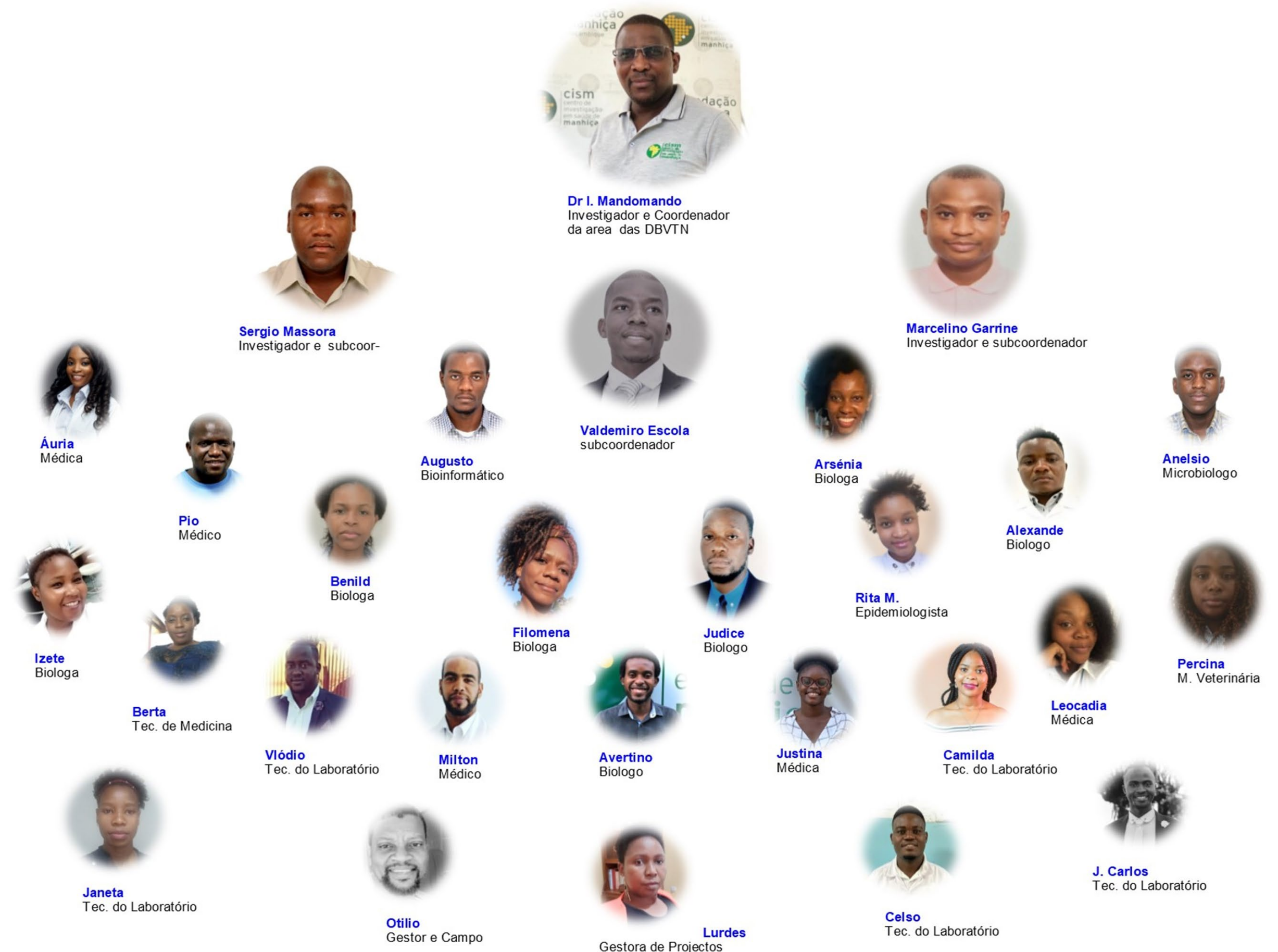


SUMMARY

- Despite of the decline of iNTS incidence over the past years, the burden of iNTS remains high and life-threatening in infancy;
- The results warrants the urgent development of conjugate vaccines, to prevent the poor outcomes related to the Salmonella serovars circulating in our study community;
- The age-specific incidence data generated in this study maybe relevant for supporting decision making (e.g. age for vaccination?)

ACKNOWLEDGEMENTS & STUDY TEAM

- Parents & guardians of the study participants;
- CISM staff for supporting data collection and laboratory processing
- Manhiça District and National Health Authorities



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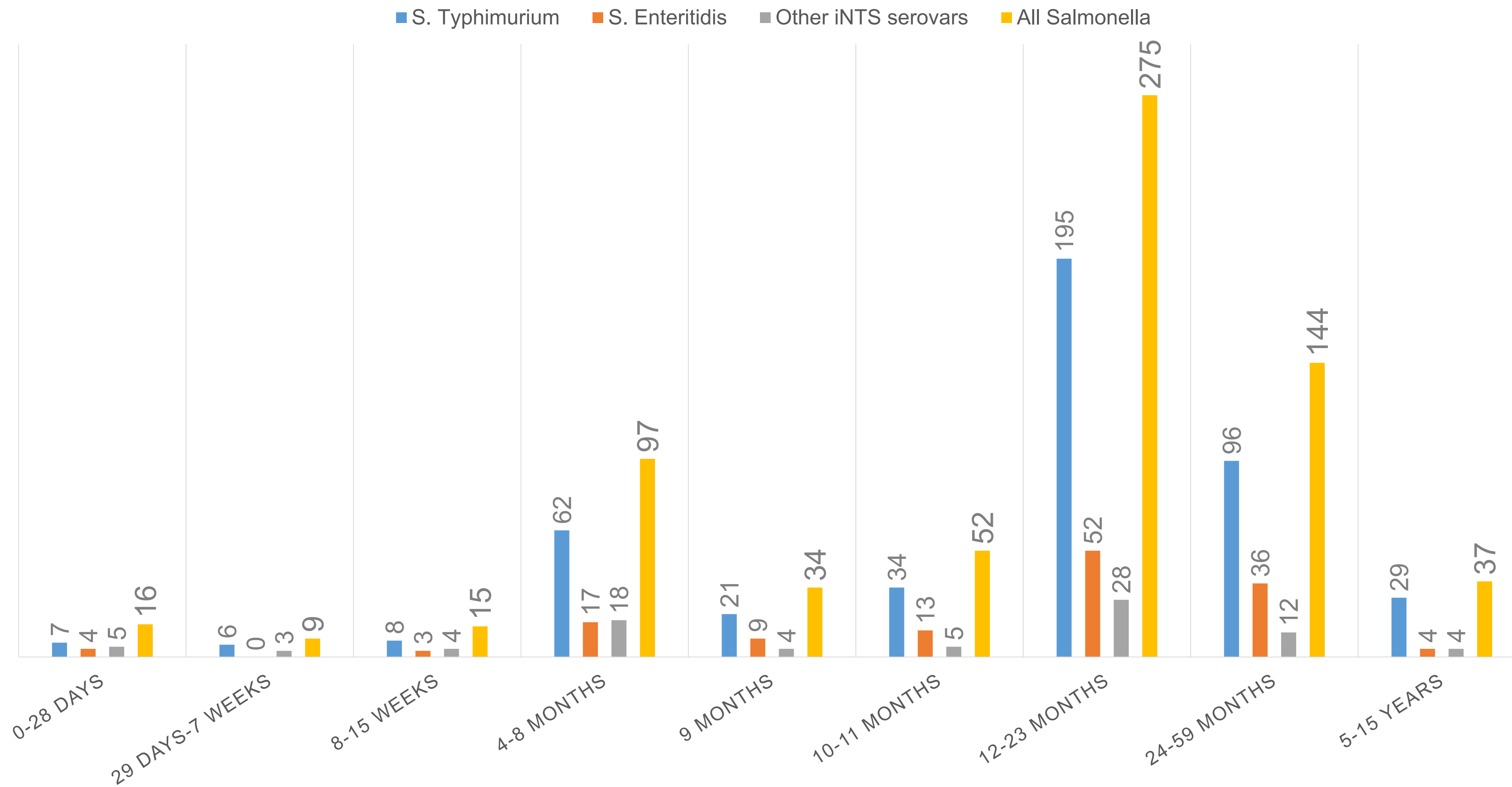
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BACKUP SLIDES

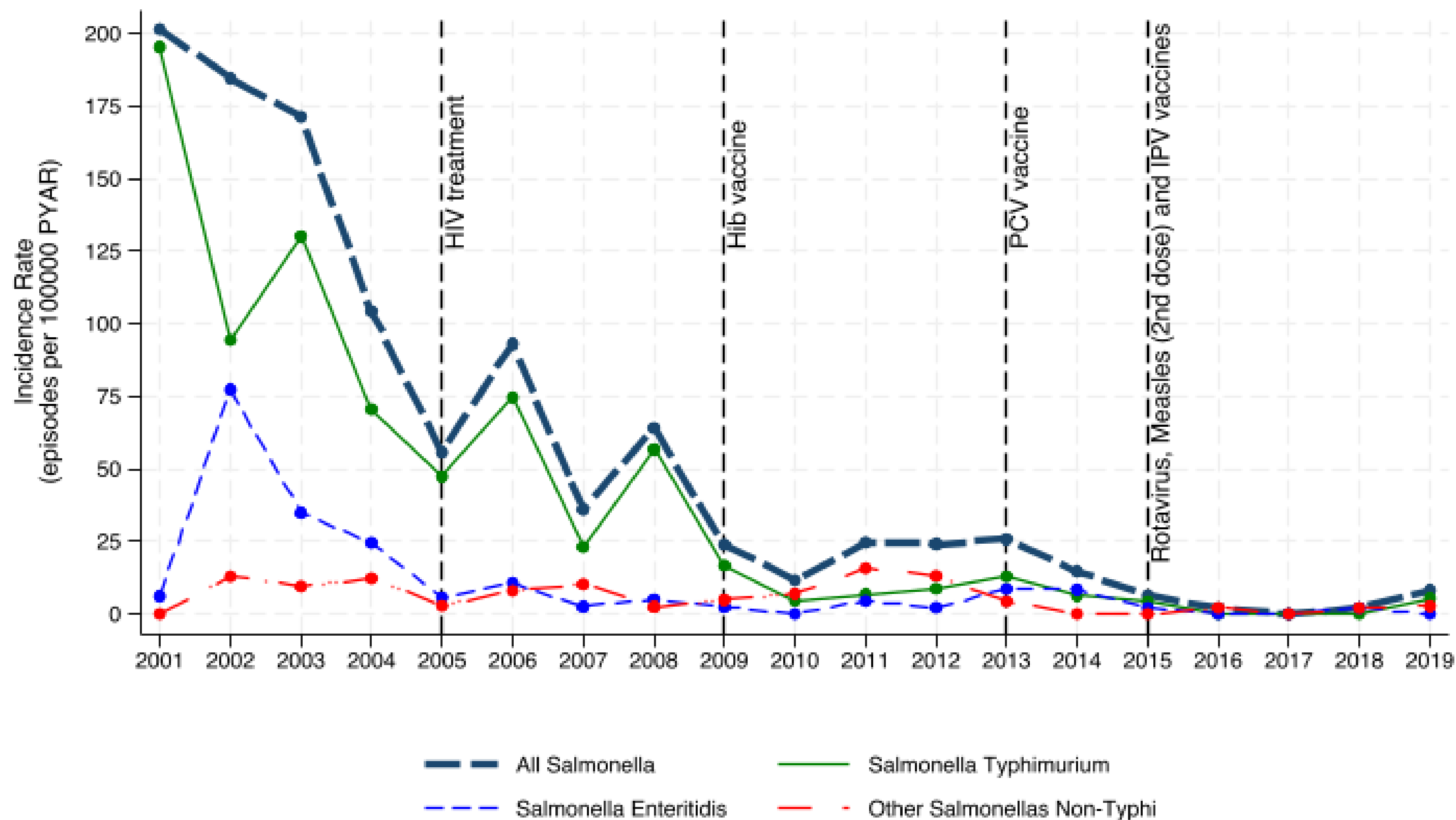
iNTS SEROVARS ISOLATED BY AGE GROUP



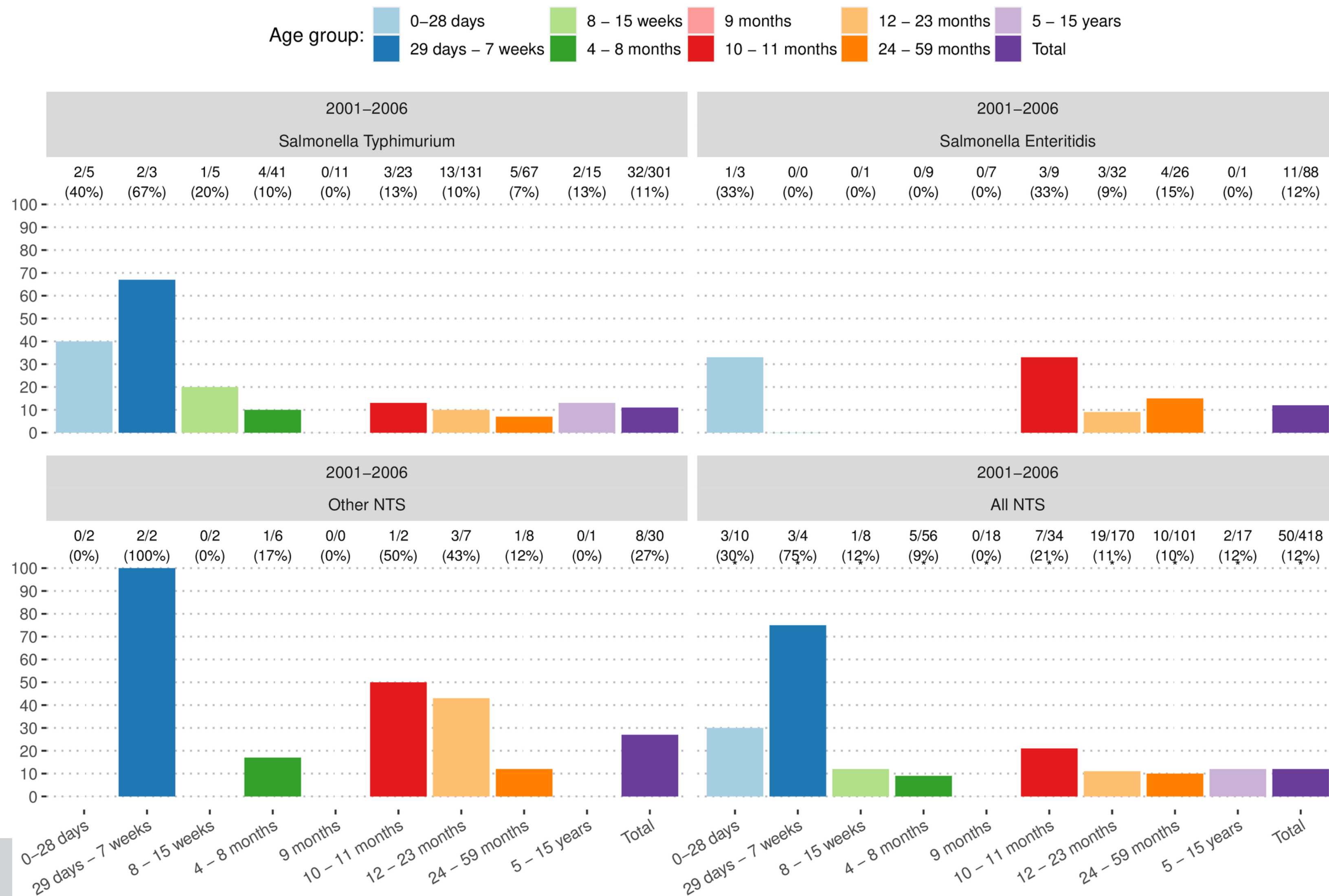
DISTRIBUTION OF OTHER *SALMONELLA* SEROVARS BY AGE

SEROVARS	0-28 days (n=5)	29 days-7 weeks (n=2)	8-15 weeks (n=4)	4-8 months (n=18)	9 months (n=4)	10-11 month (n=5)	12-23 month (n=28)	24-59 month (n=12)	5-15 years (n=8)	Total (n=82)
Untypable Salmonella	1 (20.0%)	2 (100.0%)	2 (50.0%)	12 (66.7%)	4 (100.0%)	3 (60.0%)	16 (57.1%)	9 (75.0%)	0 (0.0%)	49 (59.8%)
S. CHOLERASUIS			1 (25.0%)	1 (5.6%)			1 (3.6%)		1 (25.0%)	4 (4.9%)
S. HADAR							1 (3.6%)			1 (1.2%)
S. INFANTIS				2 (11.1%)			1 (3.6%)		1 (25.0%)	4 (4.9%)
S. DERBY								2 (16.7%)		2 (2.4%)
S. VIRCHWOW				1 (5.6%)			2 (7.1%)			3 (3.7%)
S. HEIDELBERG	1 (20.0%)						3 (10.7%)			4 (4.9%)
S. SENEGAL						1 (20.0%)	0 (0.0%)			1 (1.2%)
S. BOVISMORBIFICANS								1 (8.3%)		1 (1.2%)
S. STANLEYVILLE			1 (25.0%)							1 (1.2%)
S. ISANGI	1 (20.0%)									1 (1.2%)
S. KIBUSI						1 (20.0%)				1 (1.2%)
S. PANAMA				1 (5.6%)			1 (3.6%)			2 (2.4%)
Group B Salmonella				1 (5.6%)			3 (10.7%)		2 (50.0%)	6 (7.3%)
S. UMBILO	1 (20.0%)								0 (0.0%)	1 (1.2%)
S. URBANA	1 (20.0%)								0 (0.0%)	1 (1.2%)

OVERALL MINIMAL COMMUNITY INCIDENCE RATES iNTS



MORTALITY ASSOCIATED TO iNTS BY AGE AND SEROVAR (2001-2006)



MORTALITY ASSOCIATED TO iNTS BY AGE AND SEROVAR (2007-2019)

