

Salmonella Typhi and Paratyphi in Bangladesh and Their Antimicrobial Resistance – SEAP Data

Samir Saha

Child Health Research Foundation

Department of Microbiology

Dhaka Shishu Hospital

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SEAP Progress Milestones - Bangladesh



Hospital 1 IPD

Hospital 1 OPD

Hospital 2 IPD

Hospital 2 OPD

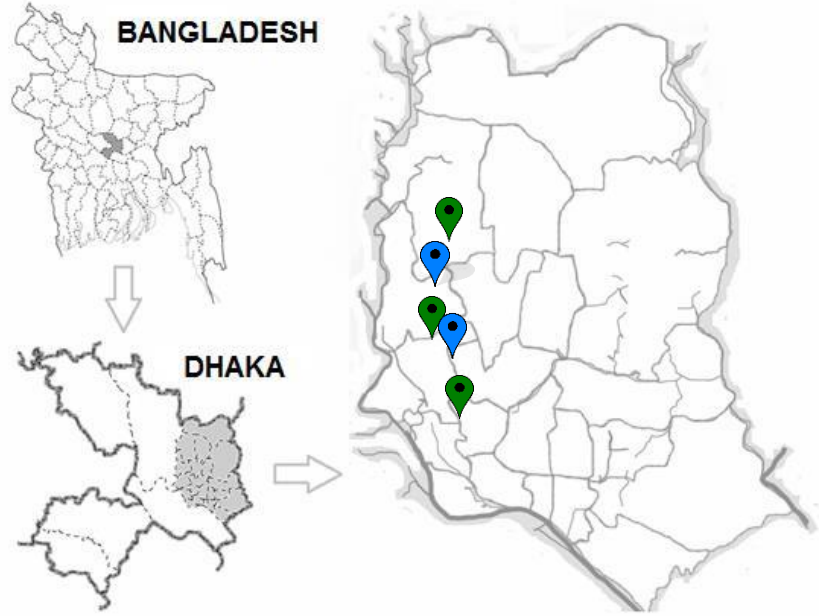
Lab Network

05/11/2016

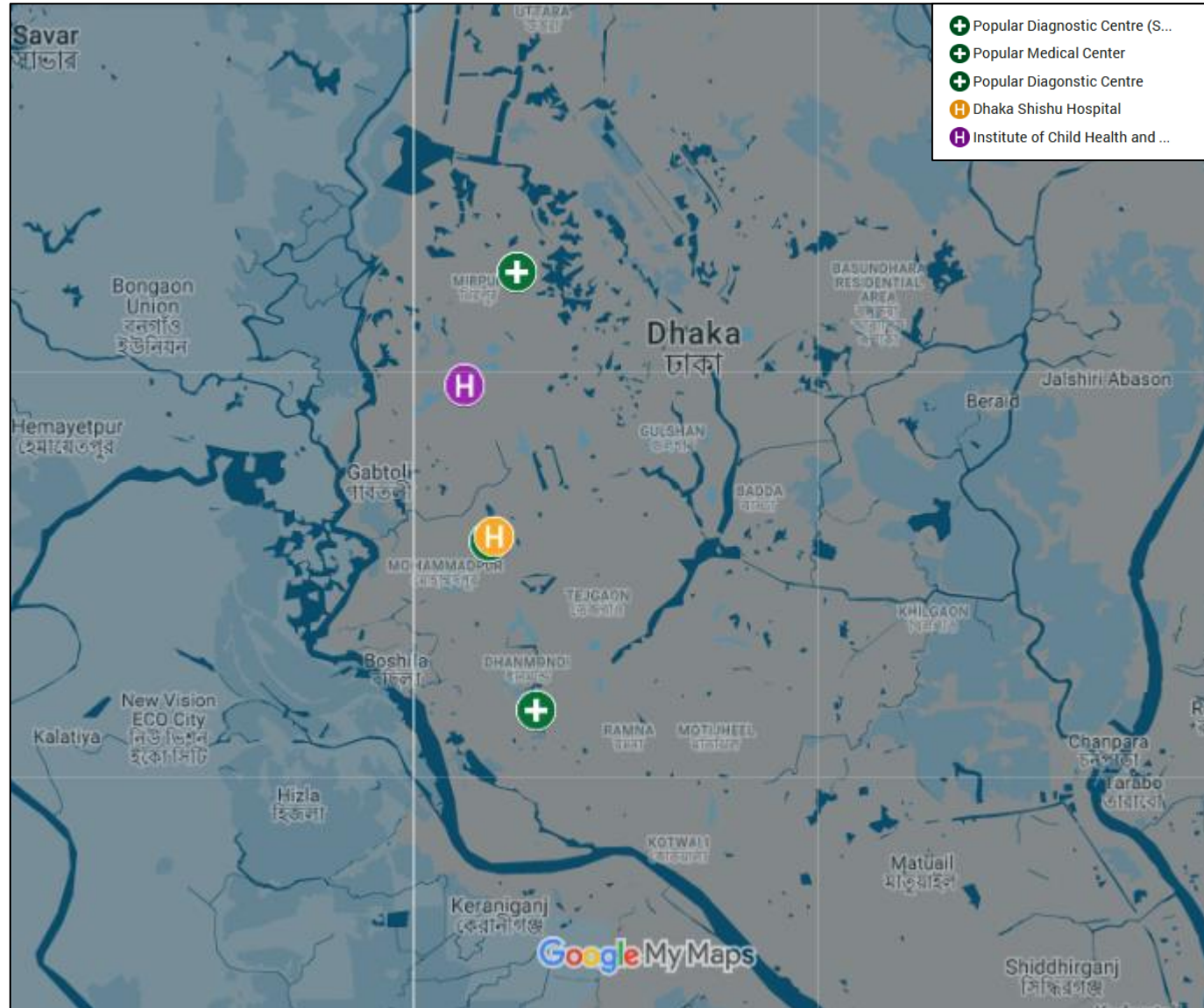
05/11/2016

14/02/2017

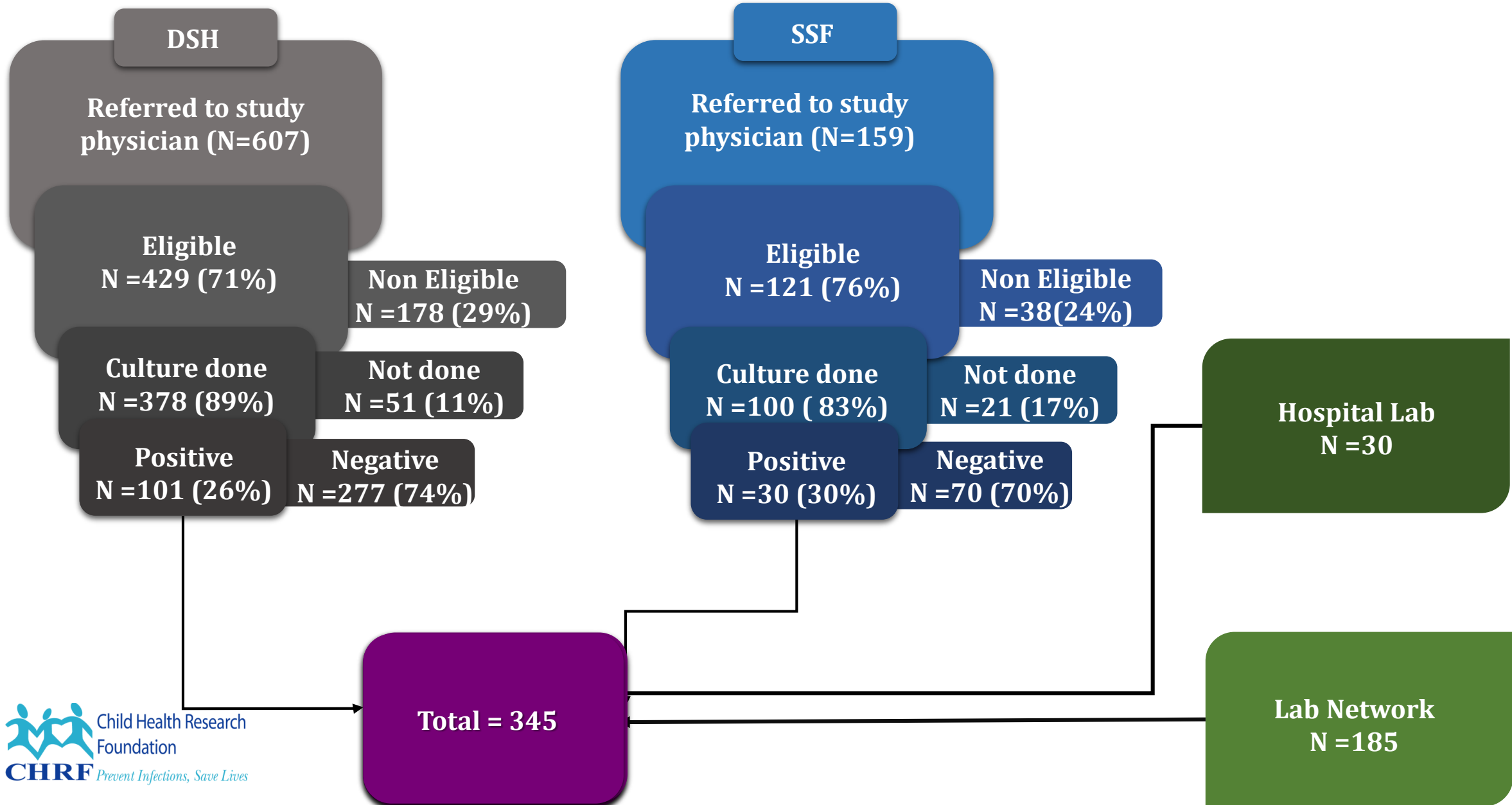
01/10/2016

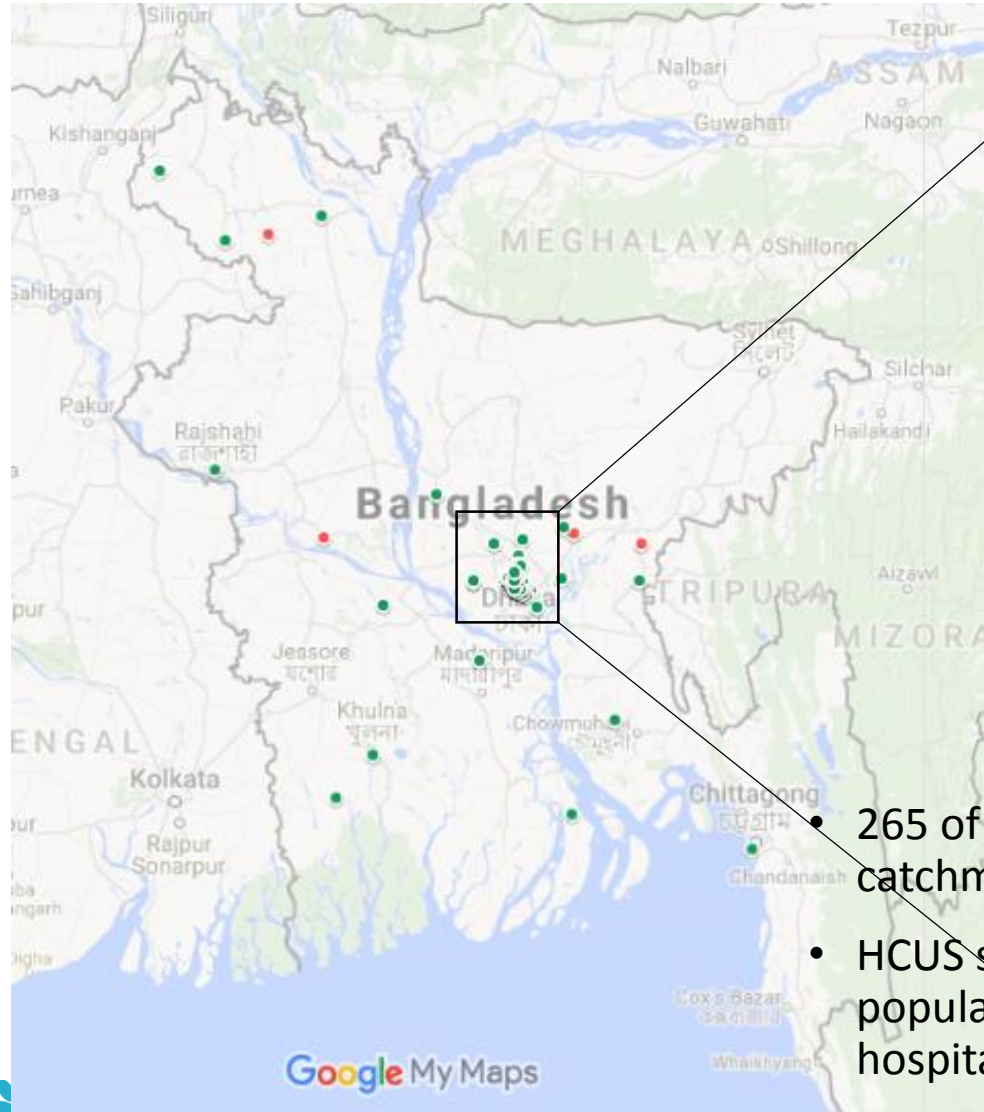


Location of Study Sites



Enrollment of Cases



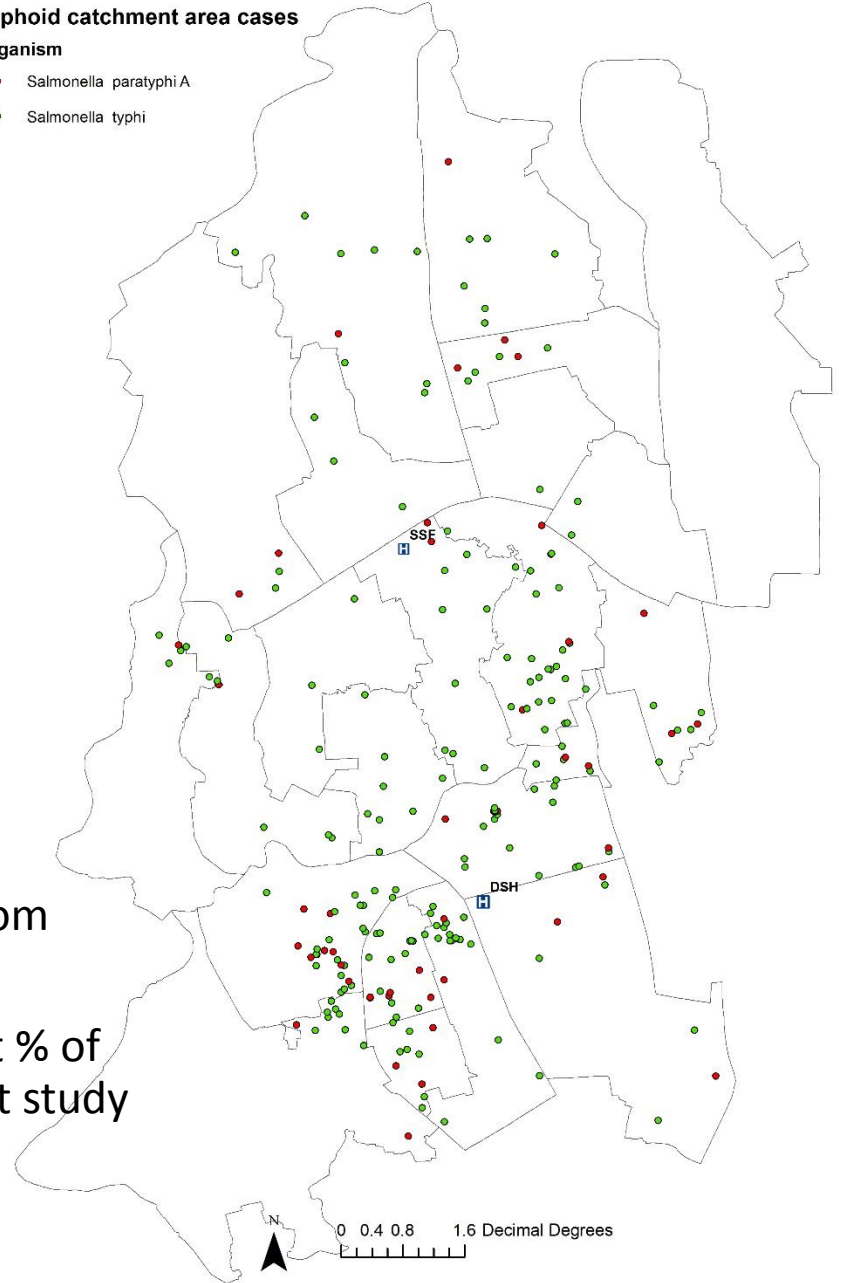


Legend

Typhoid catchment area cases

Organism

- Salmonella paratyphi A
- Salmonella typhi

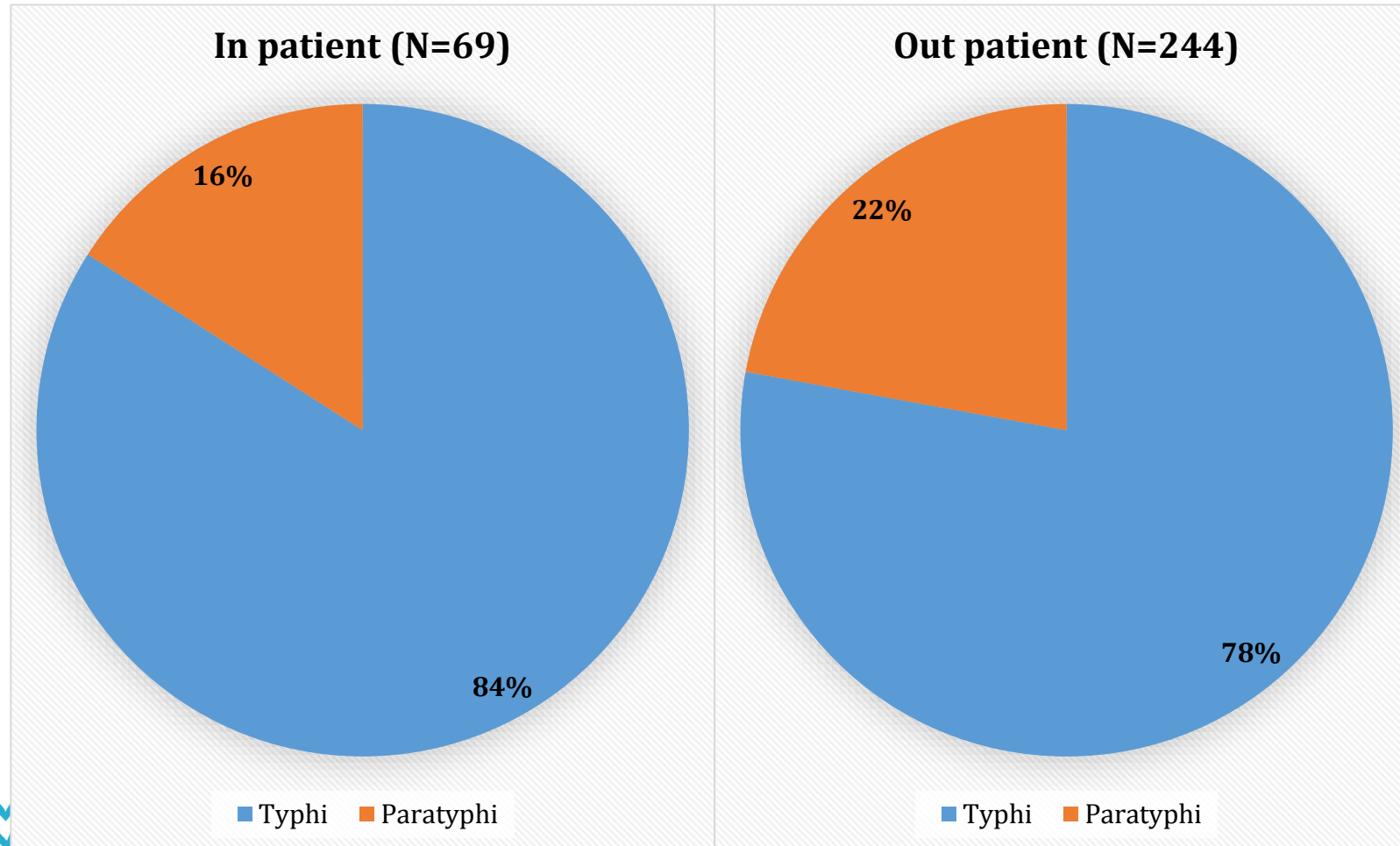


- 265 of 333 (80%) cases from catchment area
- HCUS survey will tell what % of population seeking care at study hospitals



Locations of Typhi & Paratyphi positive cases (N=333)

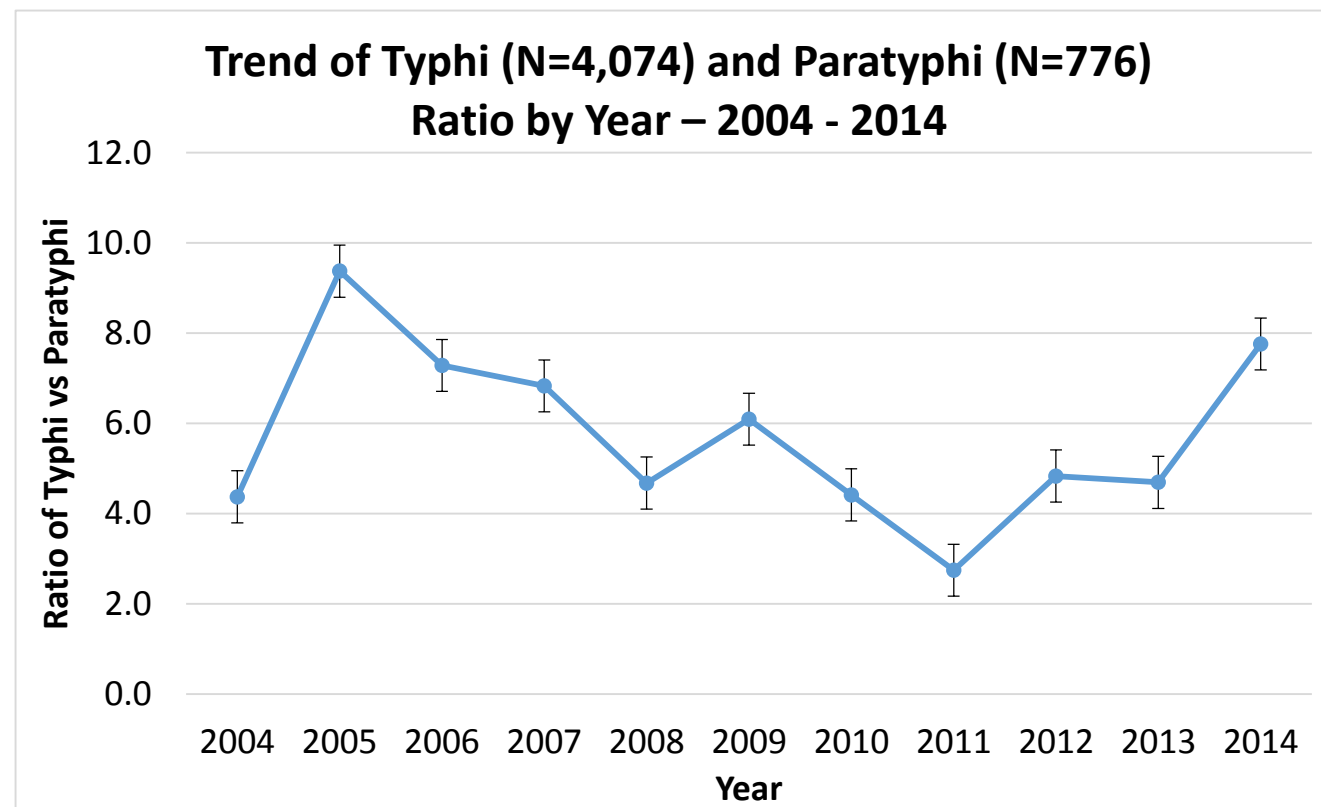
Typhi & Paratyphi Among Hospital/Community Patients (N=313)



Typhi/Paratyphi Ratio	
In Patient	5 : 1
Out Patient	4 : 1

Trend of Typhi and Paratyphi during SEAP period, Oct – Dec '16

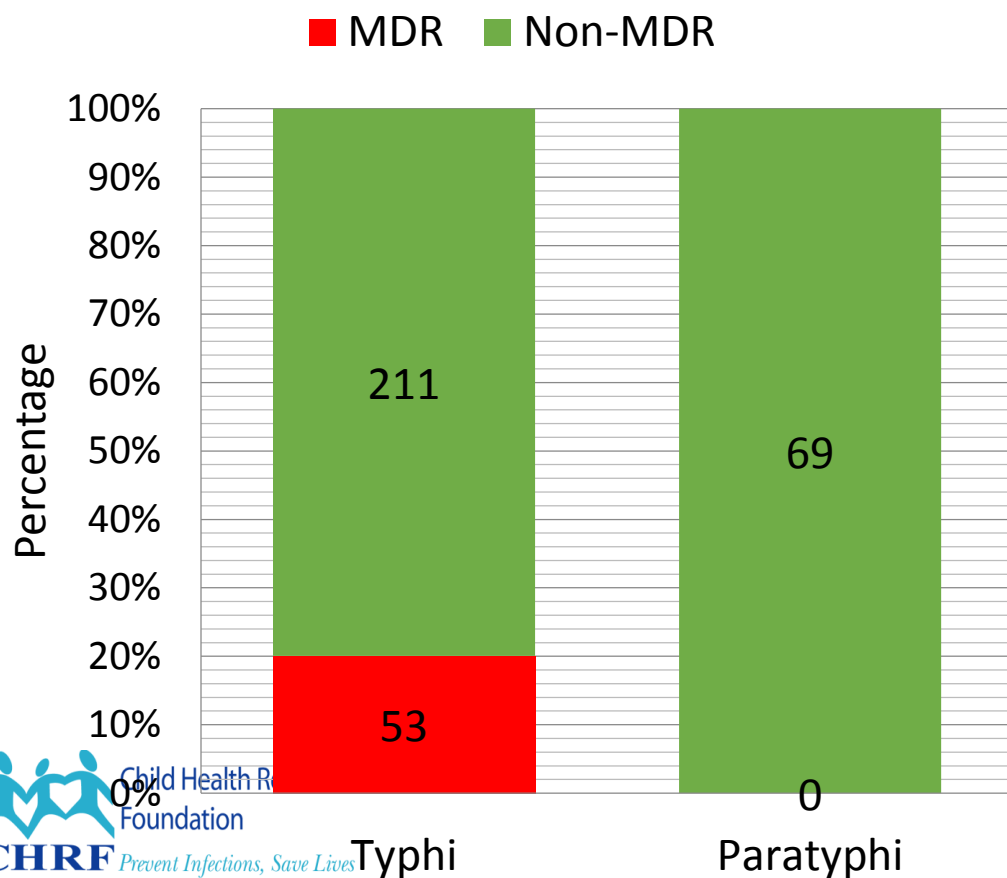
Typhi/Paratyphi Ratio
Overall (SEAP)
4 : 1
Average (2004 – 2014)
6:1 (Range 4:1 to 9:1)



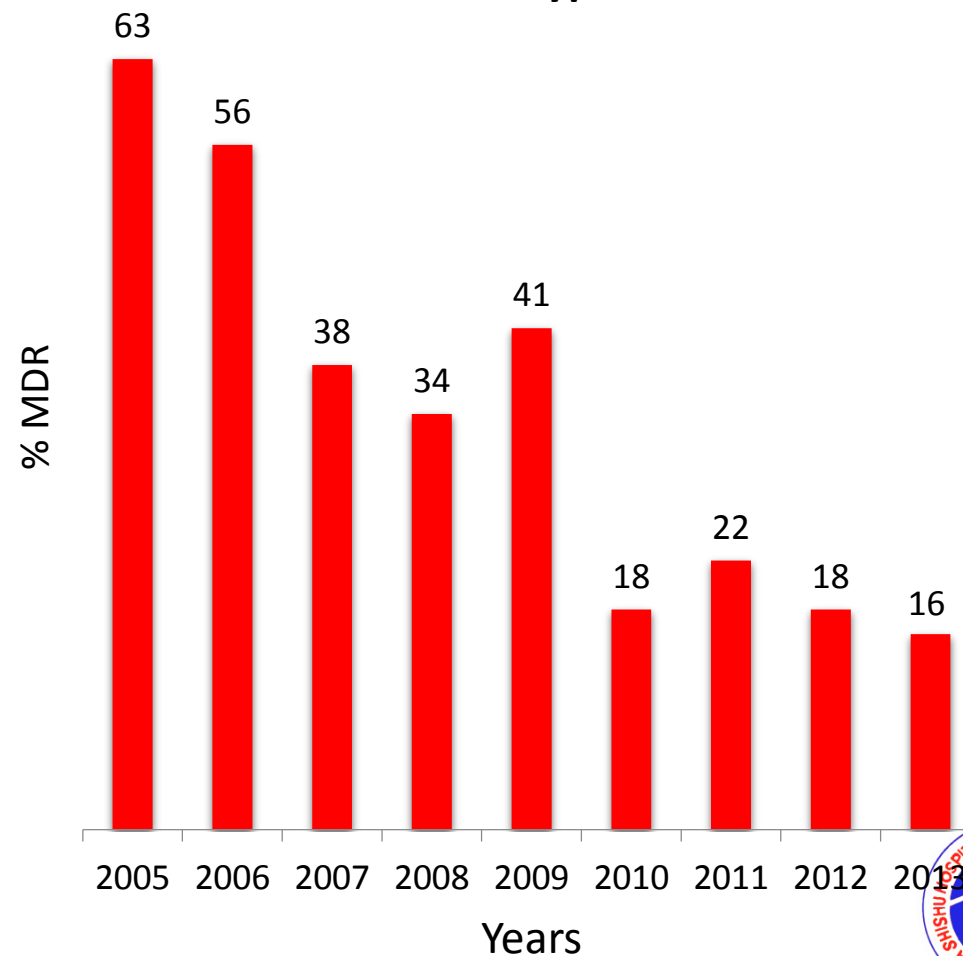
Antimicrobial Resistance

“Multidrug Resistance” (MDR)

MDR among Typhi (N= 264) & Paratyphi (N=69) (N = 333)

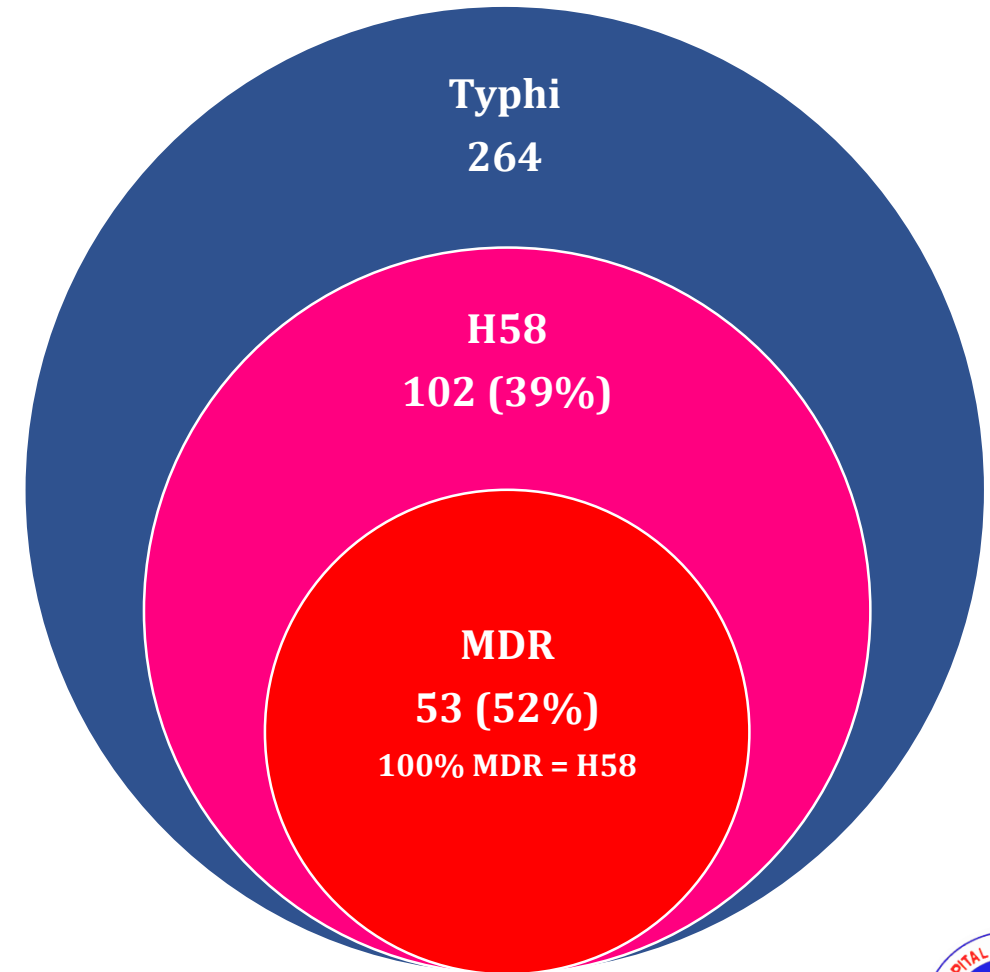


Trend of MDR in Typhi '05 to '13



“Multidrug Resistance” and Haplotype 58

- Haplotype 58
 - Linked with Multidrug resistance (Ampicillin, Cotrimoxazole and Chloramphenicol)
 - Expanding among *Salmonella* Typhi globally
 - Impact of H58 beyond MDR
 - Reduced susceptibility to Fluoroquinolone

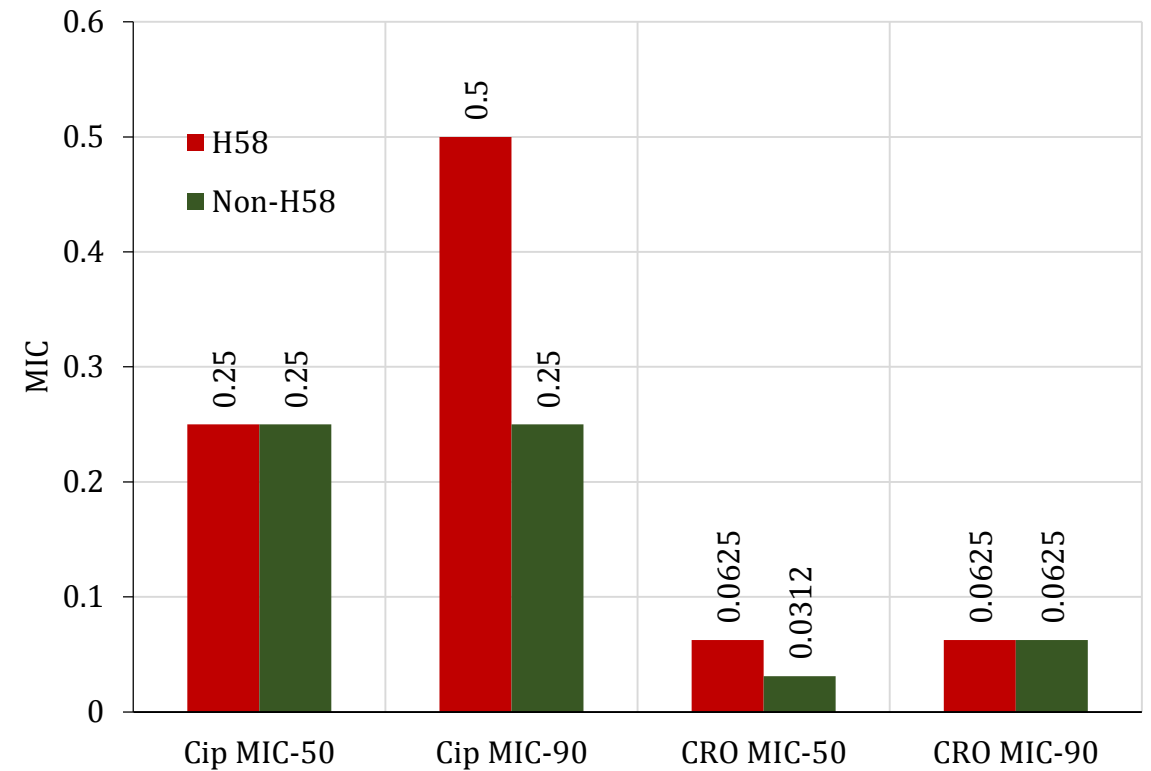


Fluroquinolone Susceptibility and Haplotype 58

- Haplotype 58

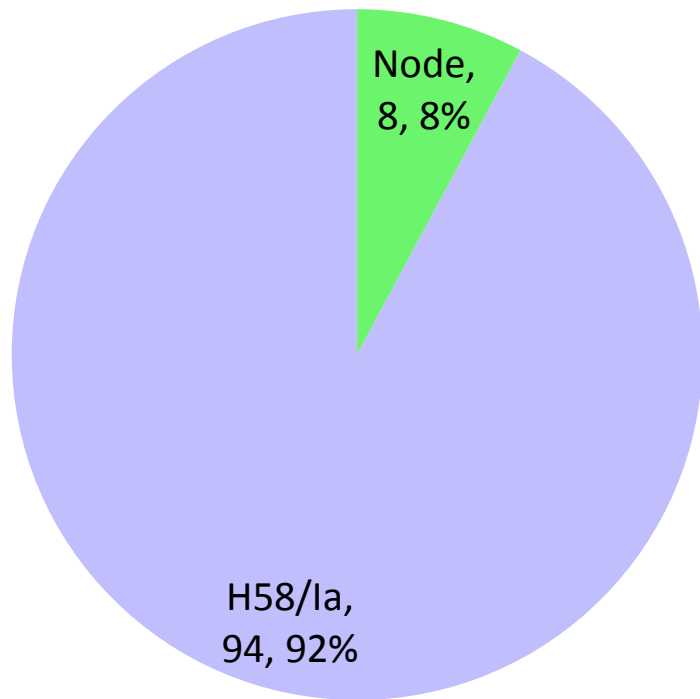
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MIC-50 & MIC-90 of Ciprofloxacin and Ceftriaxone
H58 vs Non-H58 (N=333)



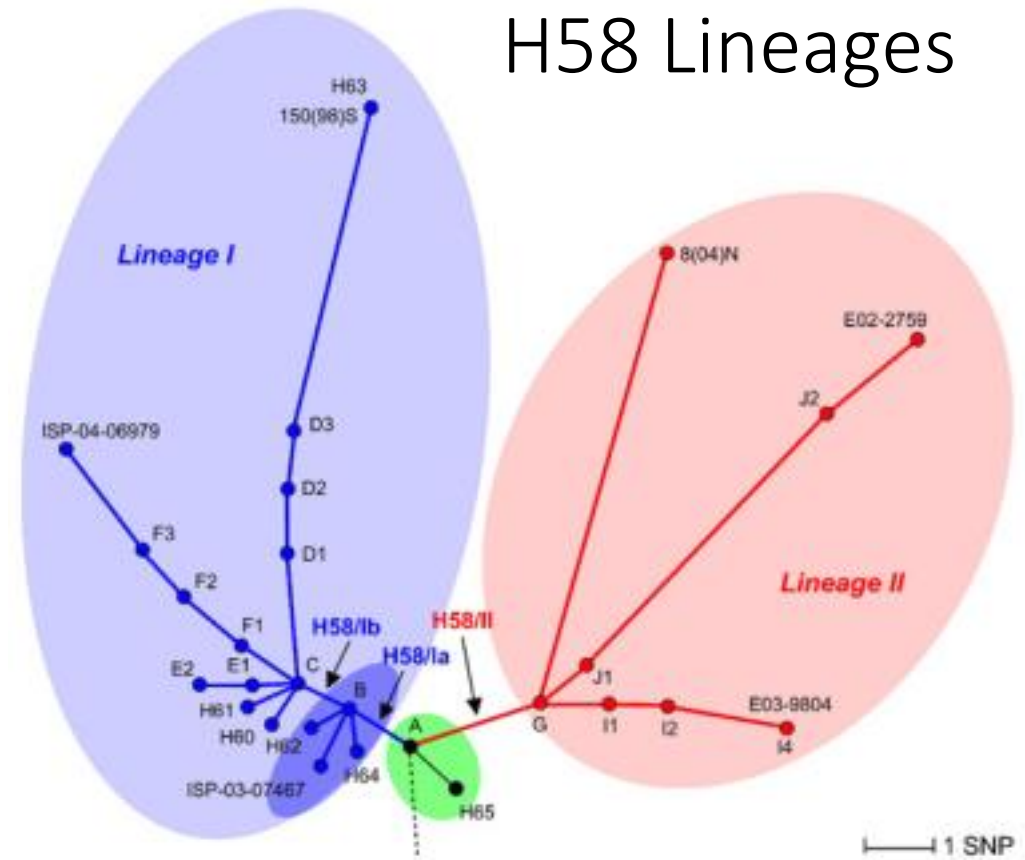
H58 Lineages – SEAP isolates

H58 (N=102)



■ Node ■ H58/1a

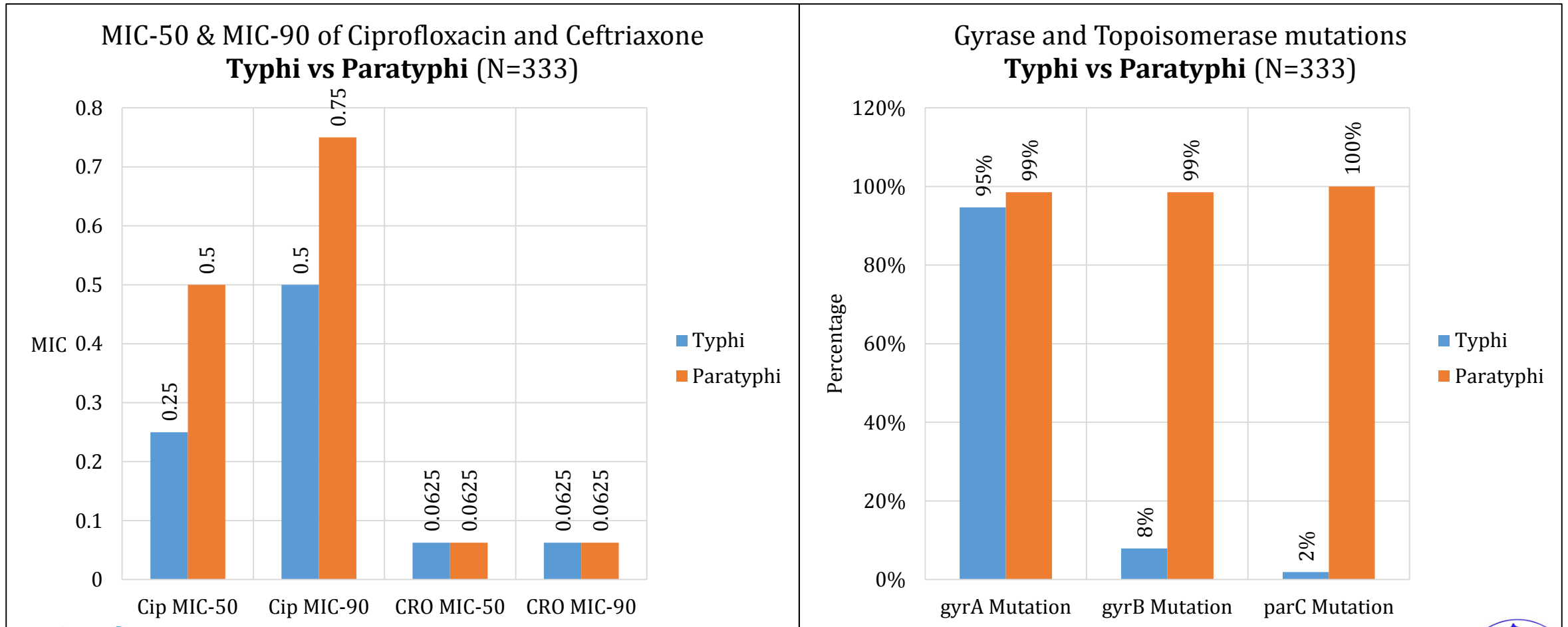
H58 Lineages



H58/1a	H58/1b	H58/II	H58 lineage	Predicted haplotypes
+	-	-	I	H58B, H62, H64
+	+	-	I	H58B-F, H60-64
-	-	+	II	H58G, I, J
-	-	-	node	H58A, H65

Murgia et al 2016; Holt et al 2011

Susceptibility to Ciprofloxacin and Ceftriaxone – Typhi and Paratyphi



Conclusions

- Preliminary data showed (December to March)
 - High burden of Typhoid and Paratyphoid
 - Typhi : Paratyphi 4 : 1
 - Remains consistent for last several years
 - Roll down of MDR (20%)
 - Spread of H58 – potential of reemergence of MDR
 - High rate of non-susceptibility to Ciprofloxacin
 - H58 and mutations in Gyrase and Topoisomerase have the roles in this resistance
 - Continuous surveillance is needed to monitor the trend AMR
 - Finally, prevention of typhoid and paratyphoid should be taken as a priority

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