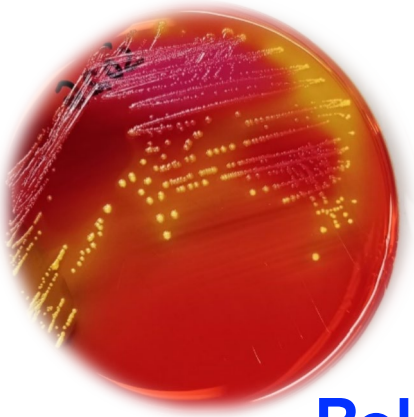

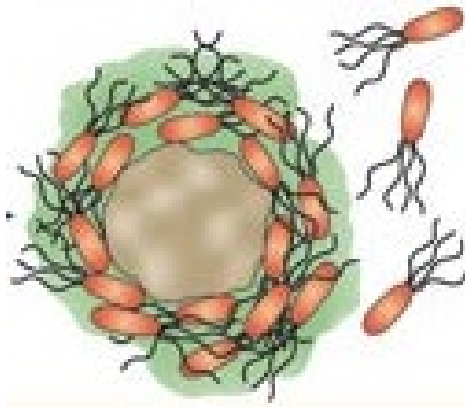

Role of Gallstones in *Salmonella* Typhi Stool Carriage and Shedding in an Urban Typhoid Endemic Setting in Nairobi, Kenya

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Kenya Medical Research Institute

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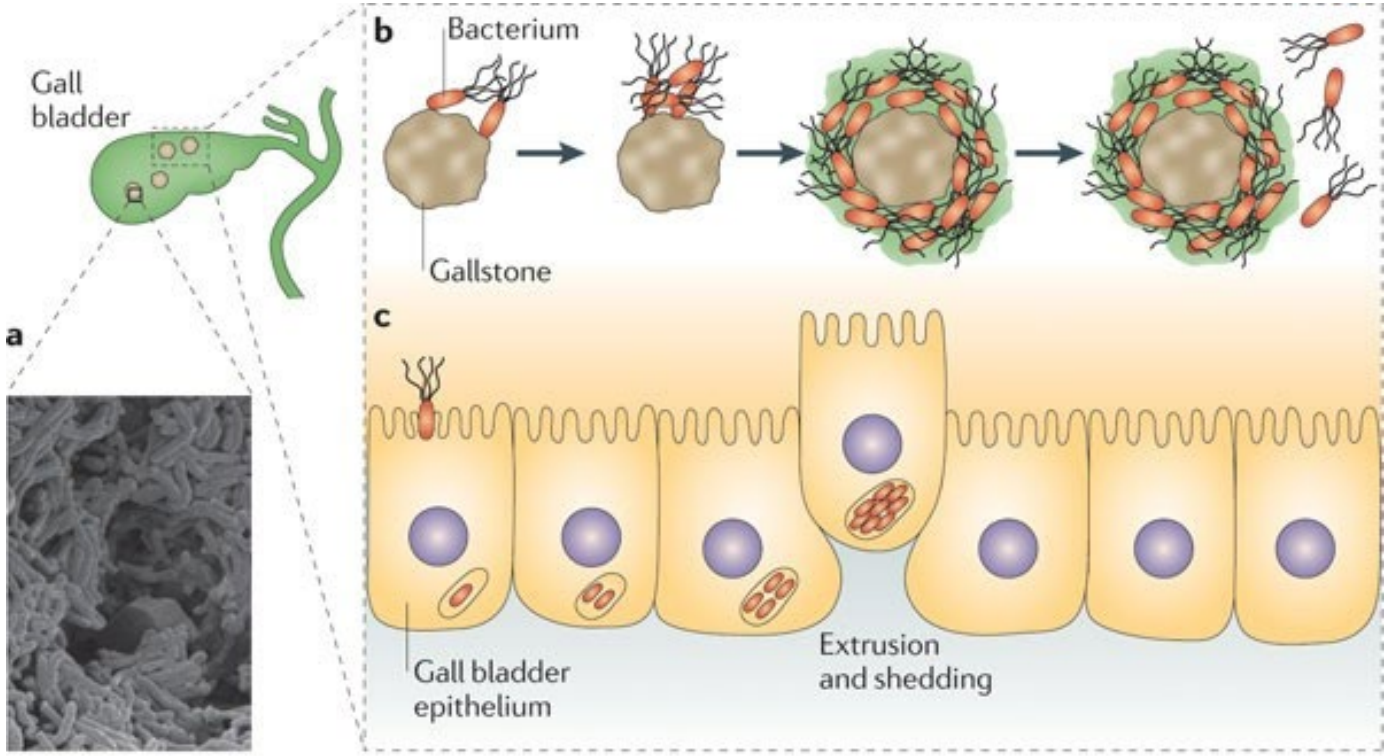
Typhoid Acute infection and Asymptomatic Carriage

- Typhoid fever has an estimated annual global incidence of 11-20 million cases and a mortality rate of 2–3% even with adequate antibiotic therapy.
- Approximately 5% of those infected fail to clear the bacteria and become carriers.
- In chronic carrier state, *S.* Typhi colonizes the biliary tract especially in patients presenting with **cholesterol gallstones** (GS); approximately 90% of chronically infected carriers have GSs.



Nature Reviews | Microbiology

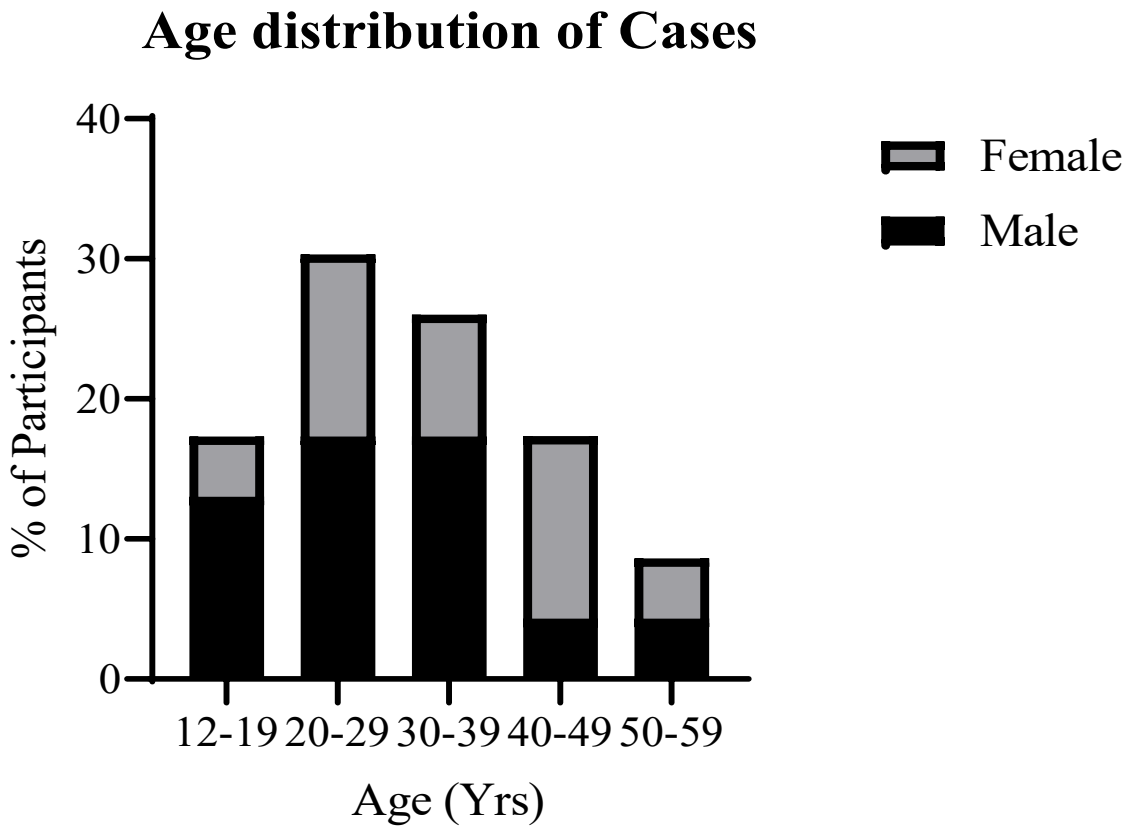
Study Area/Site

- **Mukuru informal settlement-**an endemic typhoid setting
- **Mama Lucy Kibaki Hospital (MLKH)-**county referral hospital

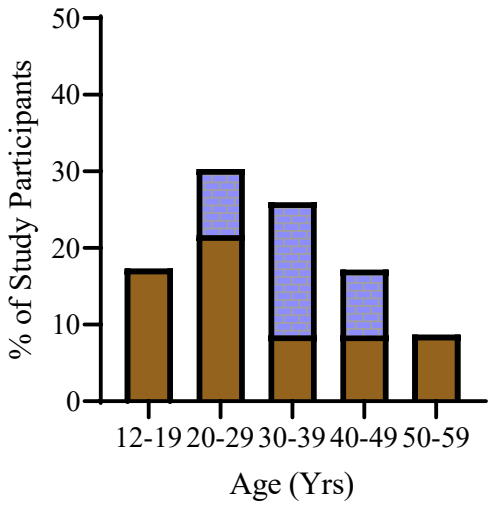
Study participants

- Confirmed (Blood and/stool culture positive) **acute cases** aged ≥12 yrs and their **household contacts**
- Follow-ups were done after treatment and Ultrasound scan done to detect Gallstones in Gallbladder.

- 23 acute cases and household contacts were successfully followed up



RESULTS: Shedding patterns of Cases and Household Contacts



Cases

Shedding

Not Shedding

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
27750												
48262	3x											
28549												
22505												
43198	2x											
10600												
21422												
45447-N												

Positive/shedding

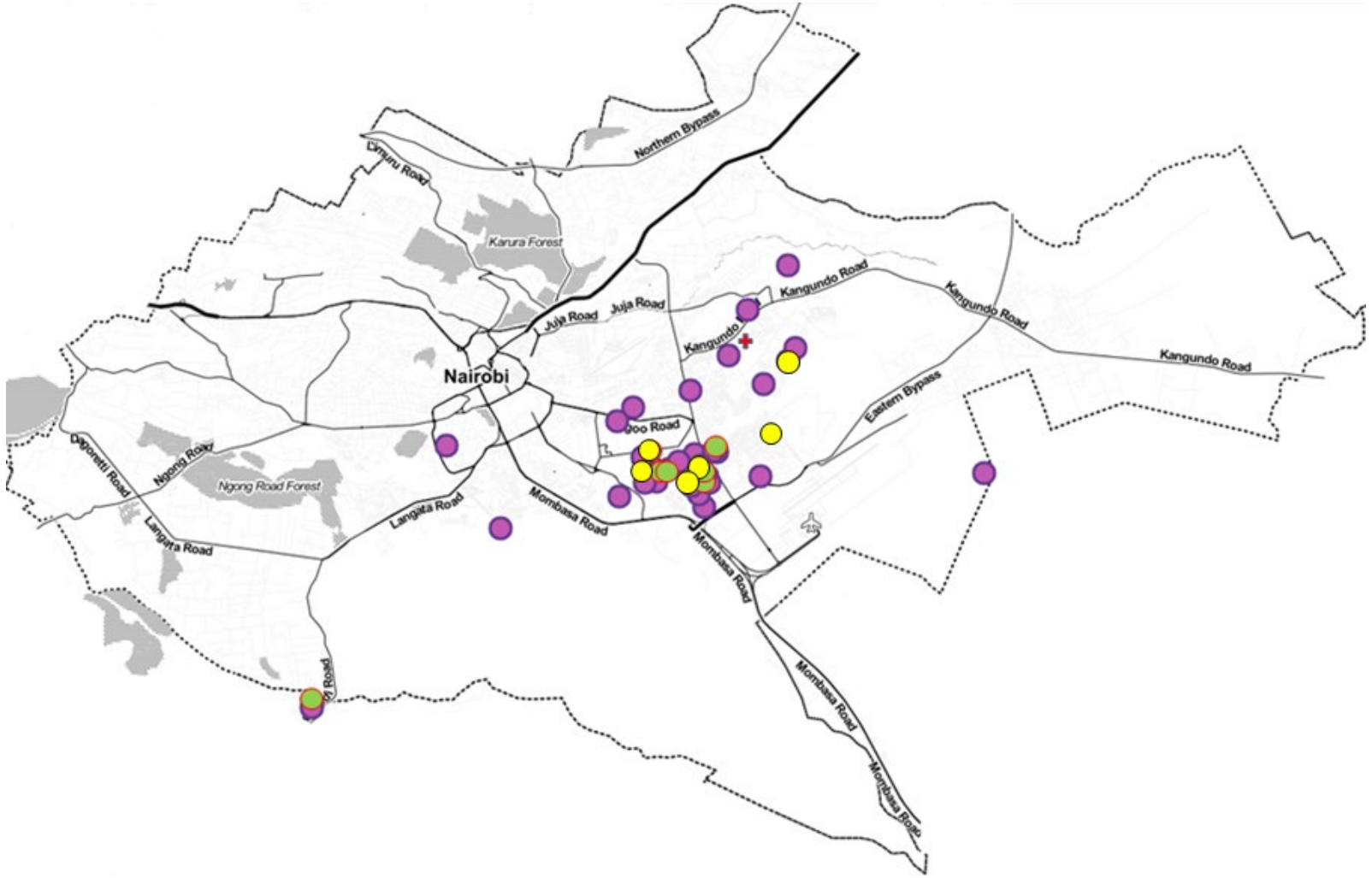
Culture negative

With gallstones

Household Contacts Shedding *S.* Typhi

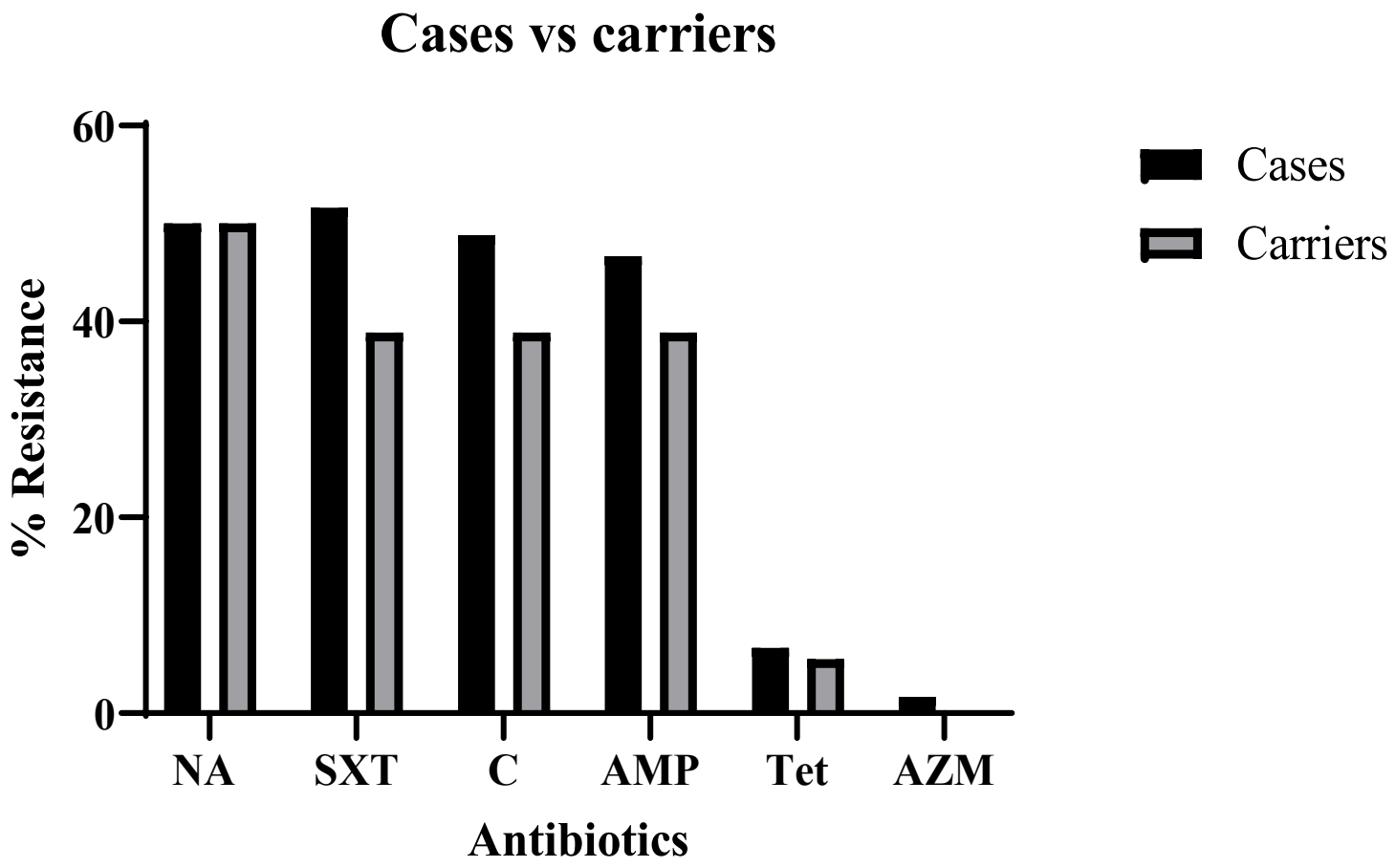
	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Month 7	Month 8	Month 9	Month 10	Month 11	Month 12
27737_C1												
48262_C1												
28549_C1												
20127_C4												
14681_C1	3x											
11673_C3	3x											
11829_C1												

Hotspots for *S.* Typhi Carriage in Nairobi/Within the Study Area

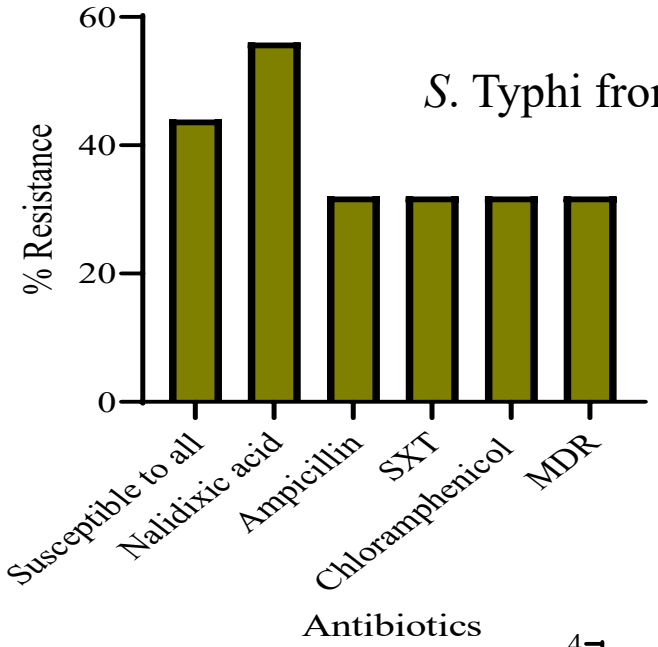


- Shedding/no gallstones
- Shedding/gallstones present
- Not Shedding

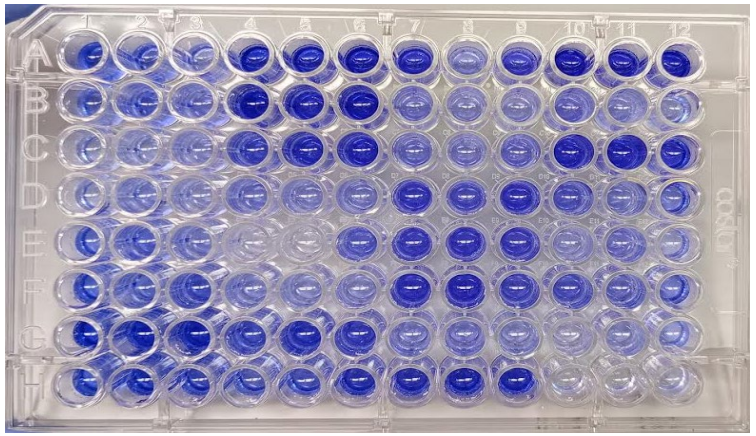
Antimicrobial Resistance Patterns

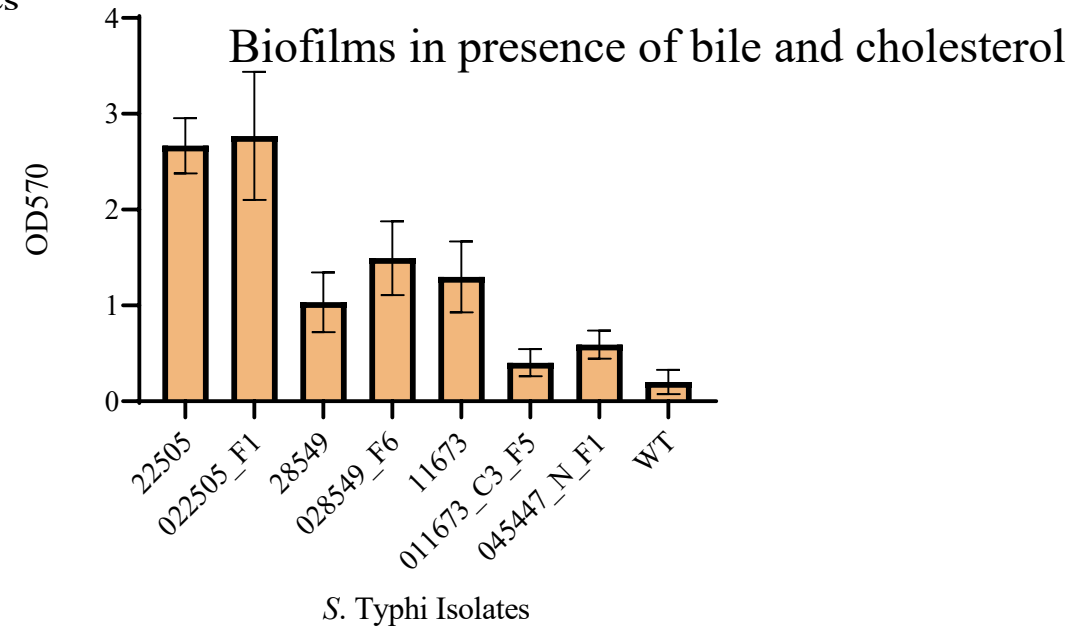


Antimicrobial Resistance Patterns



***In-vitro* Biofilm Forming Ability**





Conclusion

- Some patients fail to clear *Salmonella* Typhi immediately after treatment and go on to shed the bacterium.
- Cholesterol gallstones facilitate establishment of *S.* Typhi chronic carrier state, an important phase towards chronic shedding.
- Chronic shedding especially for MDR strains, is playing a major role in transmission and persistence of household and community typhoid infections
- Follow up analysis: WGS and phylogenetic relatedness for strains from cases, contacts and galls stones

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- **The field and Lab Teams**