

DNA-Gyrase/Topoisomerase-IV mutations and antibiotic susceptibility patterns of *Salmonella* Paratyphi A

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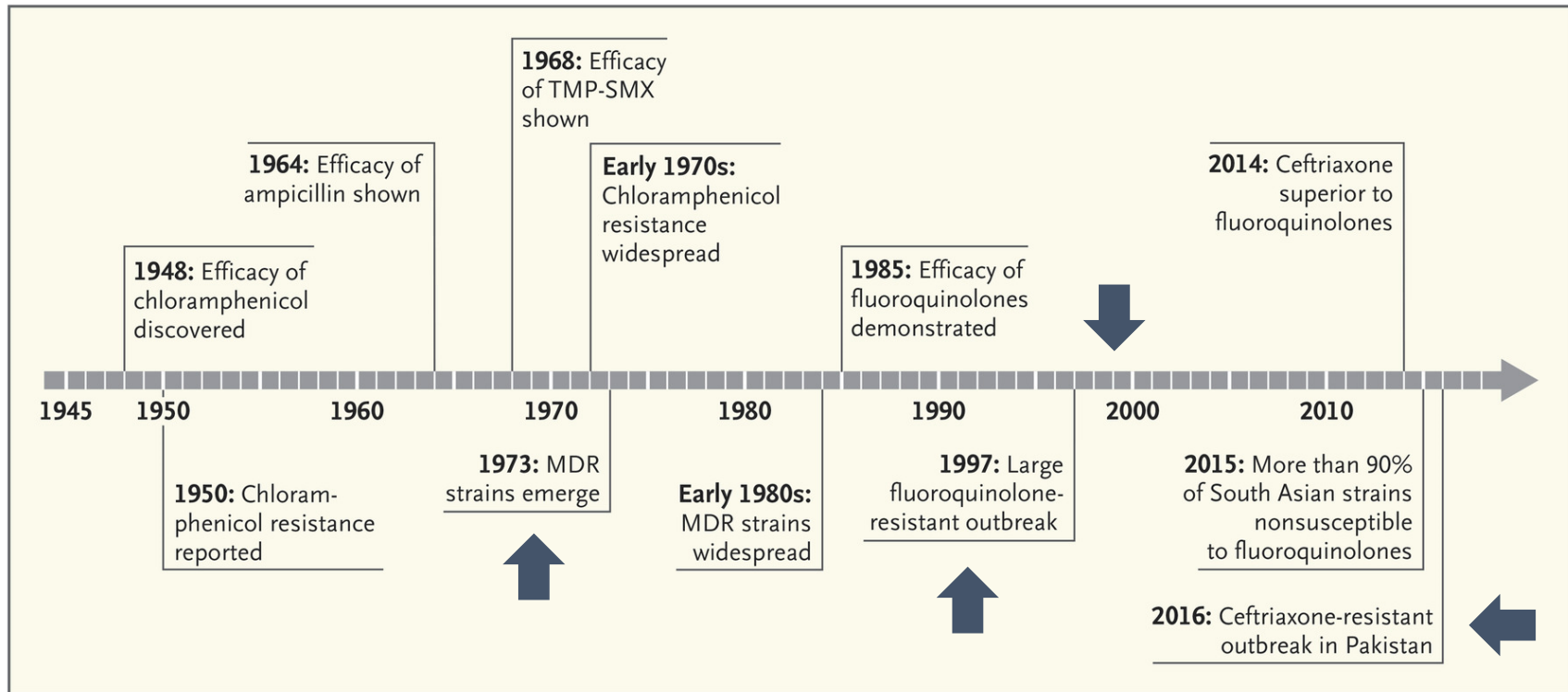
Less prevalent but not insignificant

- ❑ Caused by *Salmonella* Paratyphi A, B and C

- ❑ 3.4 million illness and 19000 deaths
GBD 2017 Causes of Death Collaborators*
GBD 2017 Disease and Injury Incidence and Prevalence Collaborators*

- ❑ Every 1 in 5 case is caused by *S. Paratyphi A* in Bangladesh
Saha, Senjuti, et al. Clinical Infectious Diseases 68.Supplement_2 (2019): S117-S123.

Same treatment, less investment



Andrews, Jason R., et al. *New England Journal of Medicine* 379.16 (2018): 1493-1495.
MDR= Ampicillin, Chloramphenicol and Cotrimoxazole resistant

All in the same basket

Typhoid = Paratyphoid?

Successful implementation needs evidence

Many studies and setups have certain limitations

1. Small number of cases.
2. Only covers healthcare facilities (IPD).
3. Short time spans.
4. Resources.
5. Expertise.

Our surveillance sites

Dhaka

Dhaka Shishu (Children) Hospital
Shishu Shasthya Foundation, and
Popular Diagnostic Center (N=3)

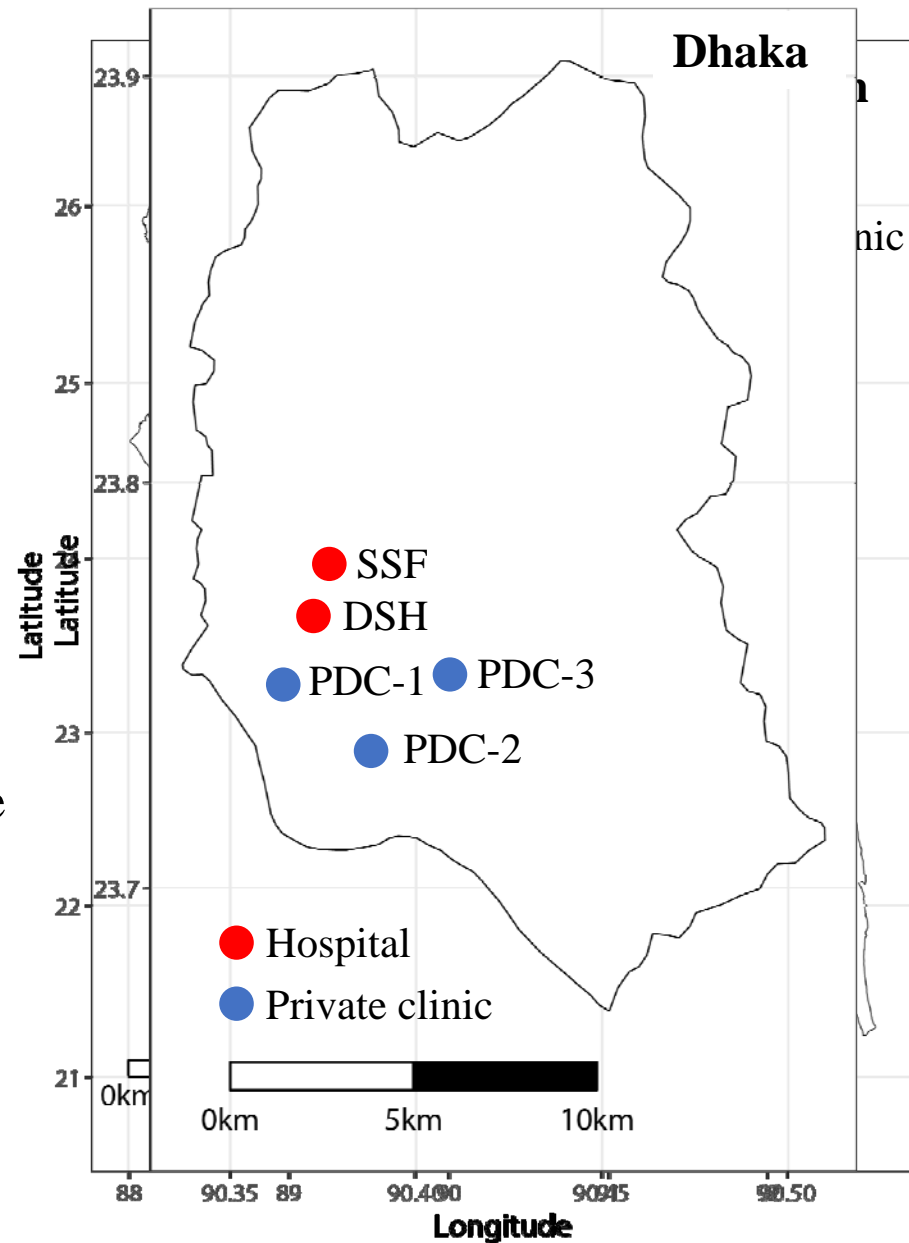
Mirpurhas

Komalini W. Parry Medical College

Chittagong

Chittagong Maa-O-Shishu Hospital

Low-cost RFLP



Objectives

Some of our goals...

1. Susceptibility pattern (MIC)

- Ciprofloxacin
- Ceftriaxone.

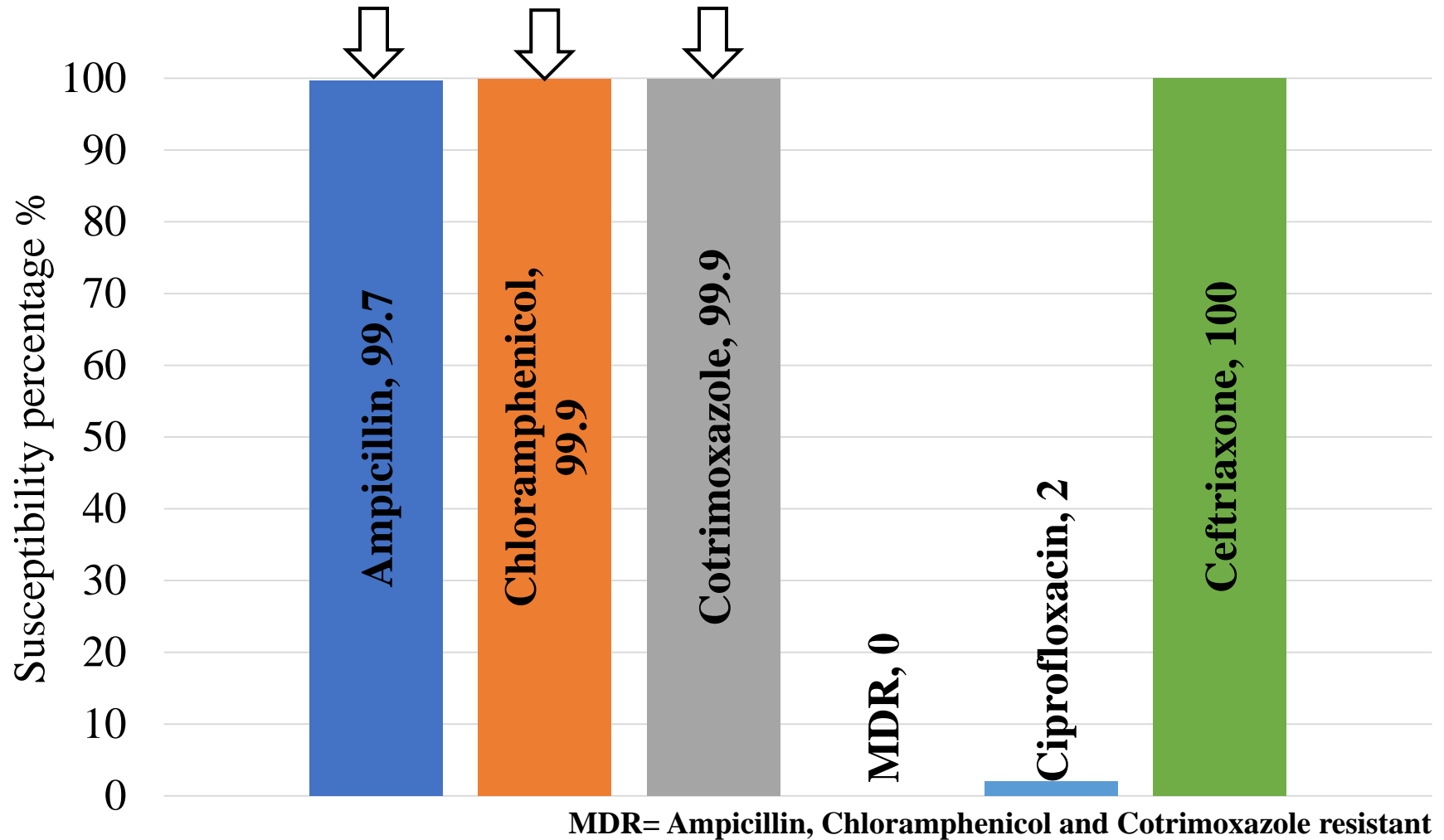
2. Prevalence of multidrug resistance

- Ampicillin
- Chloramphenicol
- Cotrimoxazole

3. Common mutations leading to quinolone resistance

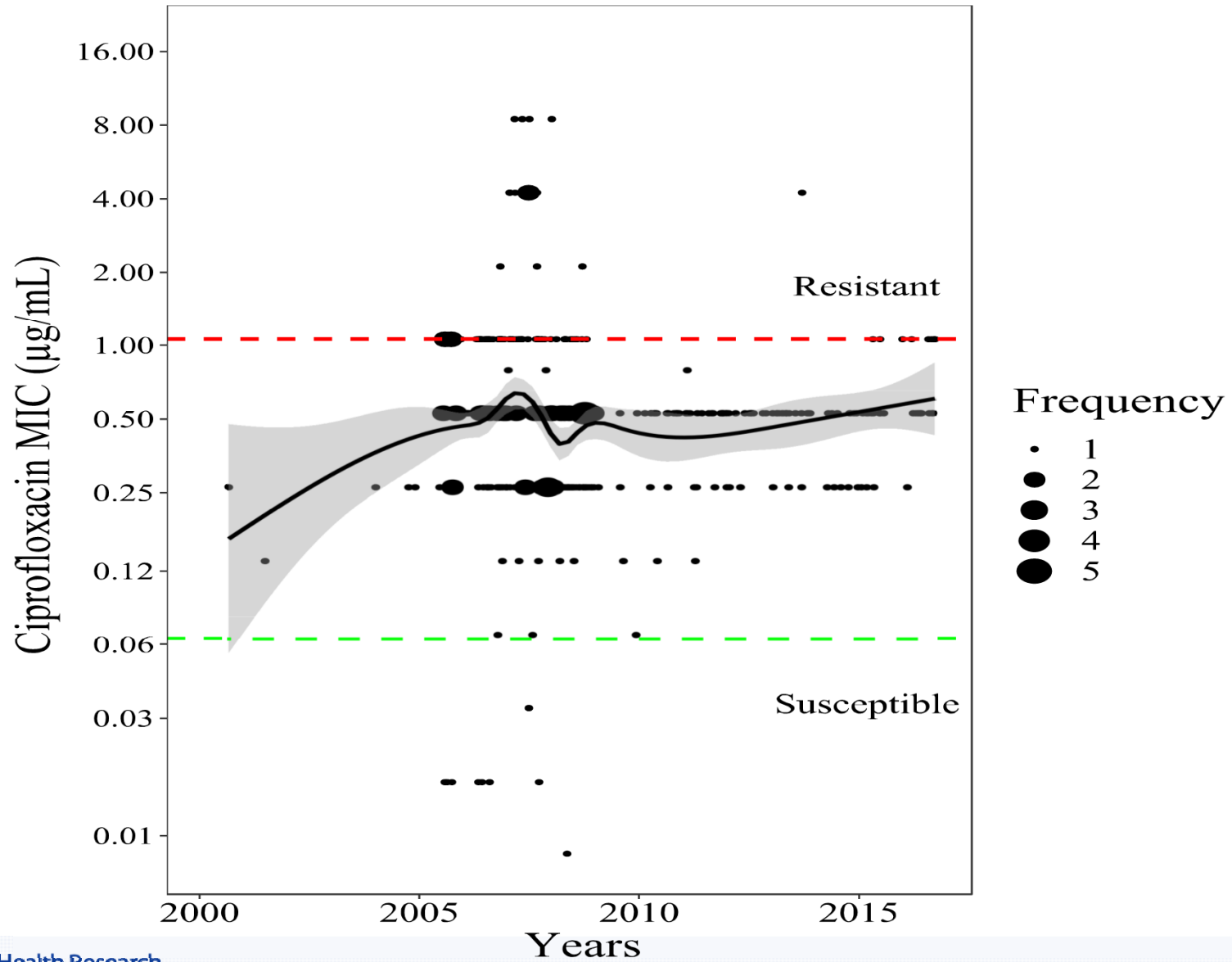
- DNA-gyrase (*gyrA*-83, 87 and *gyrB*-464)
- Topoisomerase-IV (*parC*-57, 80 and *parE*-420)

Susceptibility (Discs) of *S. Paratyphi* A (N=2141)

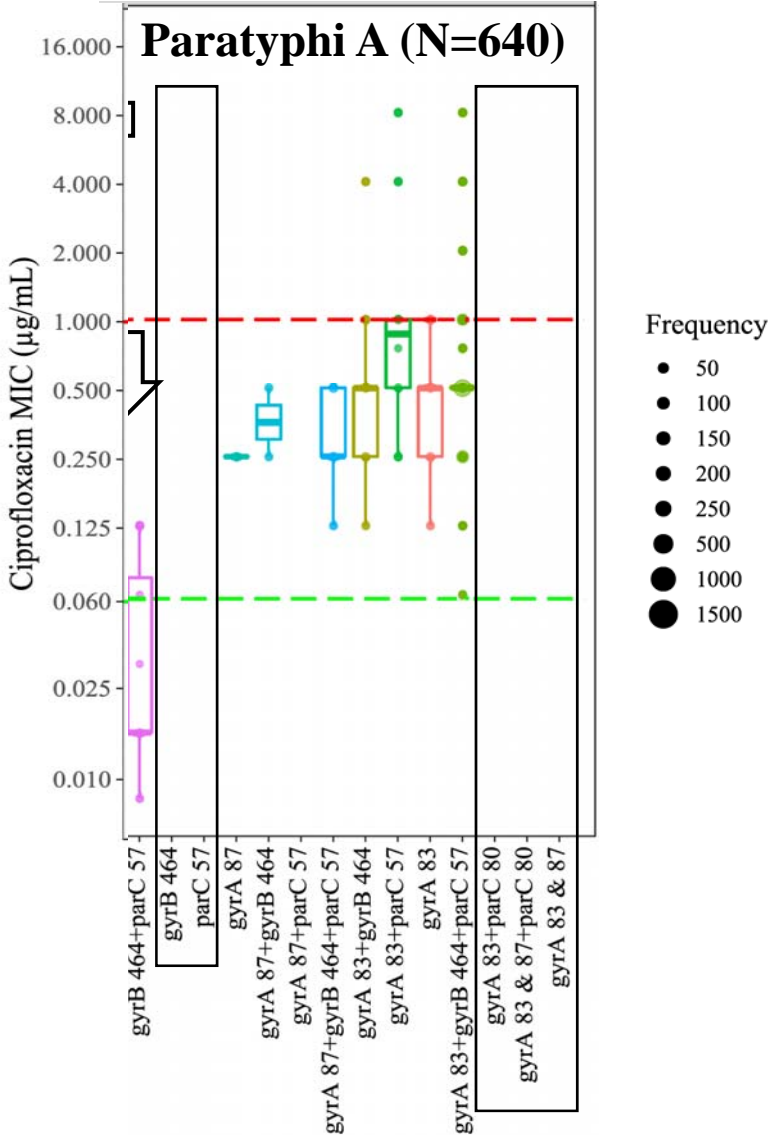


No MDR *S. Paratyphi* A!

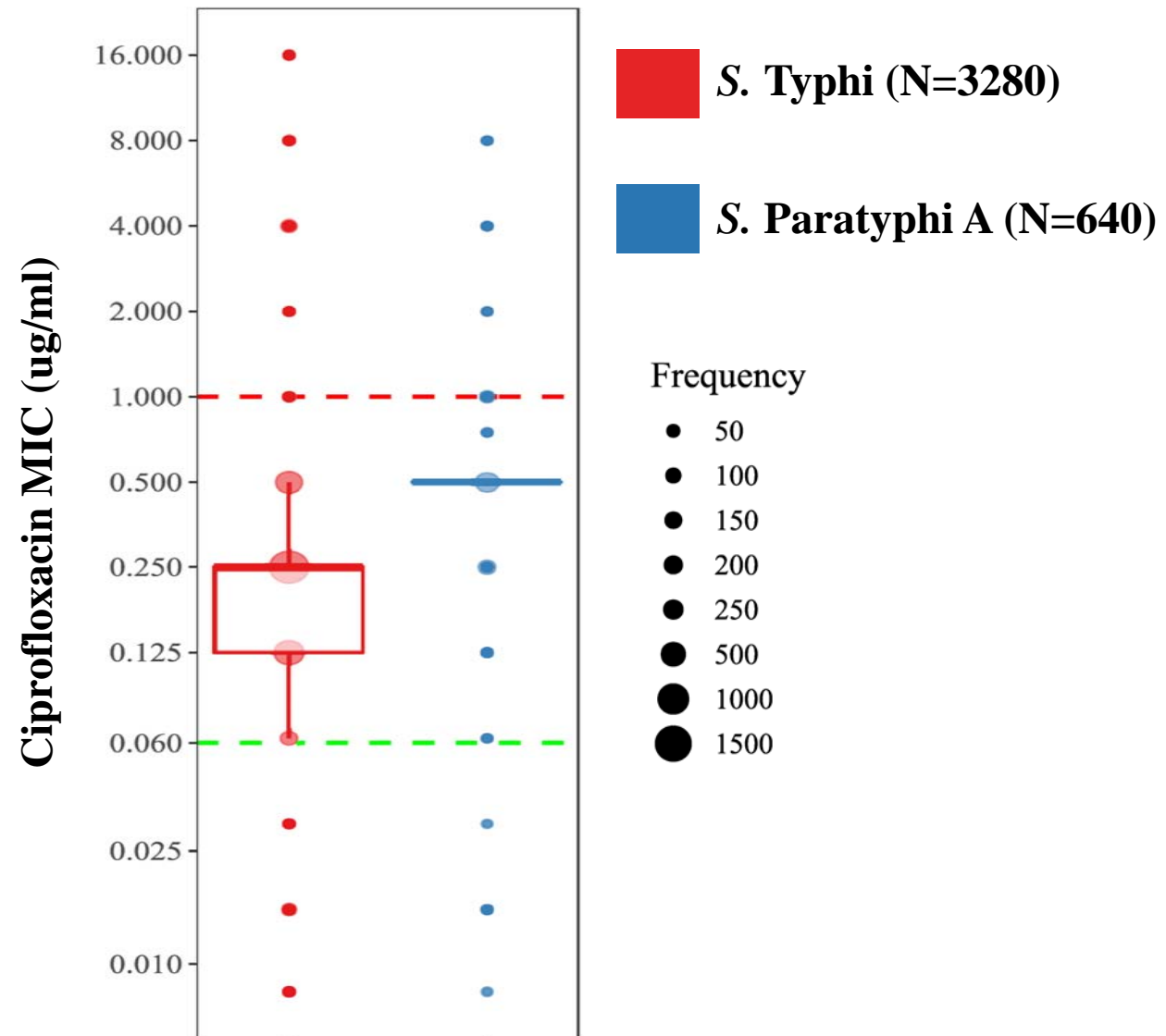
Ciprofloxacin MIC trend (N=640)



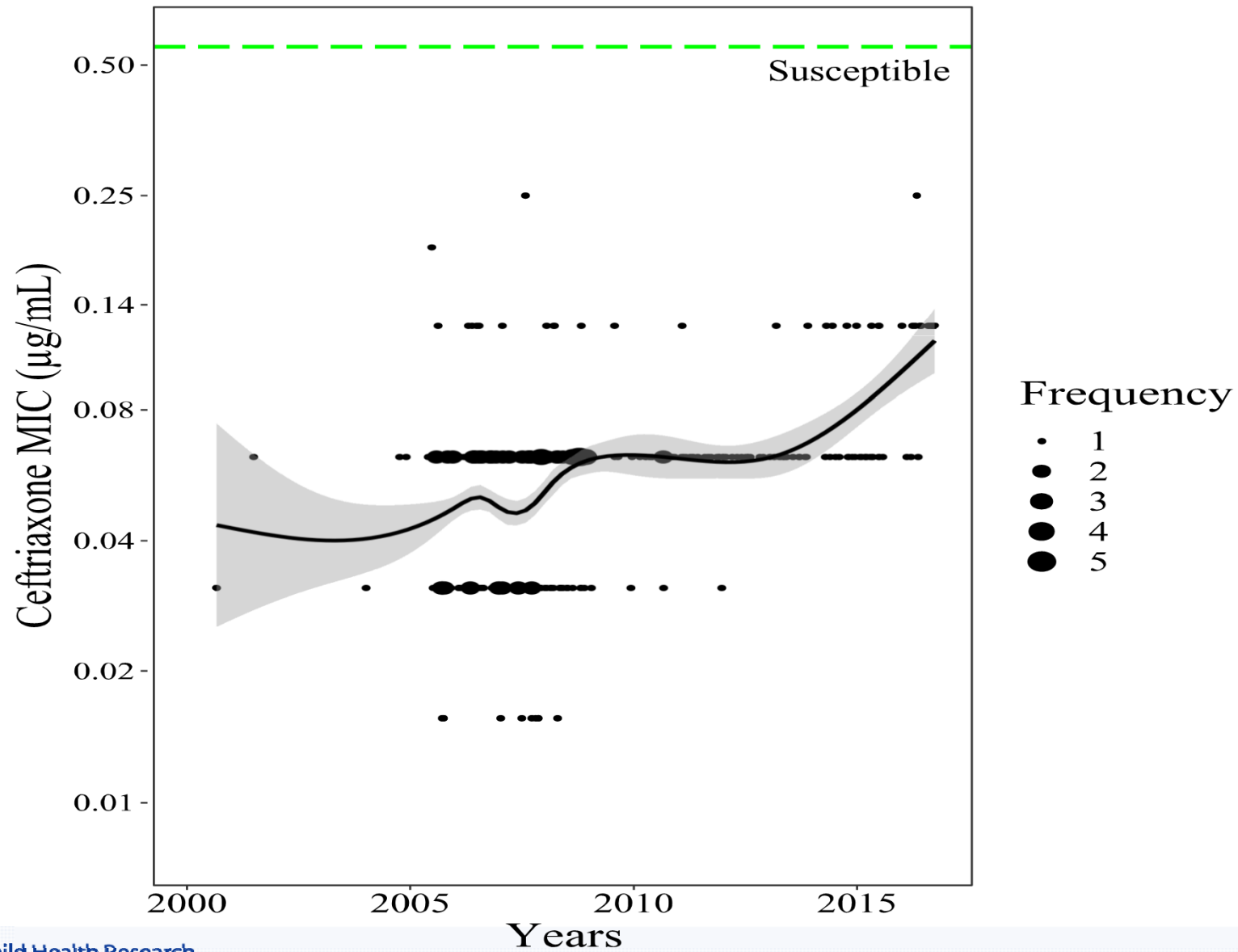
Mutation profiles



Mutation profiles



Ceftriaxone MIC trend (N=640)



Final thoughts and future directions

- High prevalence of DCS supported by mutations
 - Both should not be grouped together
 - Older drugs may buy us some time
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- Whole genome sequencing may answer many questions
 - No ceftriaxone resistance, but, monitoring for AMR should be continued.
 - Vaccination in future.

Thank you!

