

***Salmonella enterica* serovar Paratyphi A:  
Common cause of Salmonellosis among  
patients attending Om Hospital and  
Research Centre, Kathmandu, Nepal**



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# Country Profile: Nepal

- Total Area : 147,181 sq Km
- Total Population : 29million



Kathmandu Metropolitan City



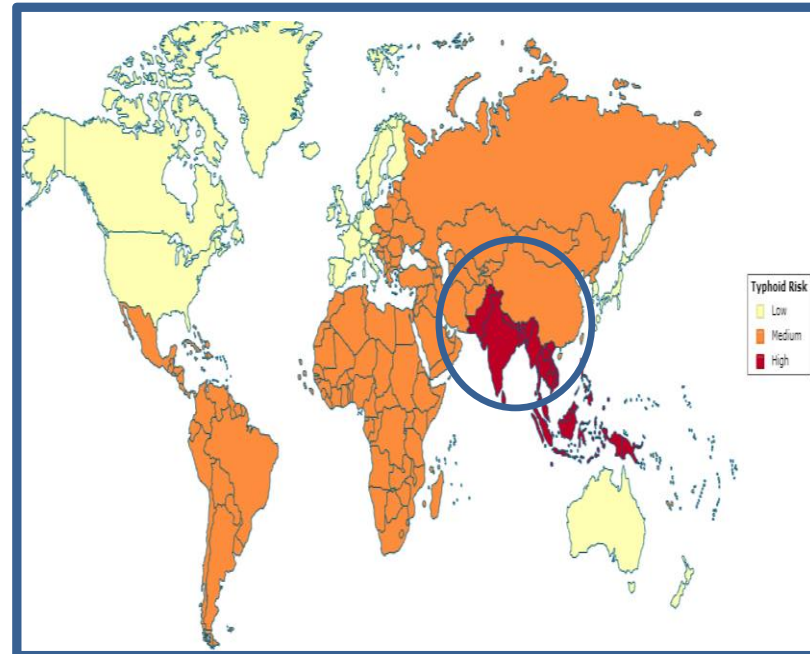






# ParaTyphoid: Disease Burden

- Paratyphoid and Typhoid fever is a global public health problem
- Typhoid affects around 22 million and Paratyphoid affects about 6 million people a year
- Due to typhoid fever 200,000 deaths occur worldwide and due to paratyphoid around 60,000 death occur in a year
- Kathmandu, the capital city of Nepal, has previously been coined a typhoid fever capital of the world
- Enteric Fever among top 10 causes for OPD consultation & among five causes for hospitalization in Nepal



# Background

- Enteric fever due to S.Typhi and S.Paratyphi A is common in South East Asia, as is in Nepal where it is endemic throughout the year.
- At Om hospital, S. Paratyphi A was found to be one of the common cause of enteric fever
- Variability was however noted in terms of year, month, age , gender and antibiograms of the isolates.

# Objectives

- This five years retrospective study (2009- 2013) was carried out to ;
  - 1) to determine total number of cases of S.Paratyphi A with age, sex, month and year of their occurrence during this period, and
  - 2) to determine the antimicrobial susceptibility of the isolates

# Study Settings

Om Hospital and Research Centre, Chabahil, Kathmandu, Nepal



## Methods

- Five years (2009-2013)\* data was collected from Records of microbiology section of blood culture, in Department of Pathology, Om Hospital, from the patients with signs and symptoms of Enteric fever. (\*2014)
- Samples were processed according to standard protocol of American society of Microbiology (ASM).
- Antibiotic susceptibility of the isolates was determined using Kirby-Bauer disc diffusion method on Mueller Hinton Agar at pH 7.2. Antibiotic discs tested were: Amoxicillin(10 mcg), Ciprofloxacin(5 mcg), Ofloxacin(5 mcg), Cefixime(30 mcg), Cotrimoxazole (25 mcg), Ceftriaxone(30 mcg), Nalidixic Acid(30 mcg)\*\* ,Chloramphenicol(30 mcg) and Azithromycin(15 mcg). (HiMedia Antimicrobial Susceptibility Discs)

(\*\*After 2013)

# Findings

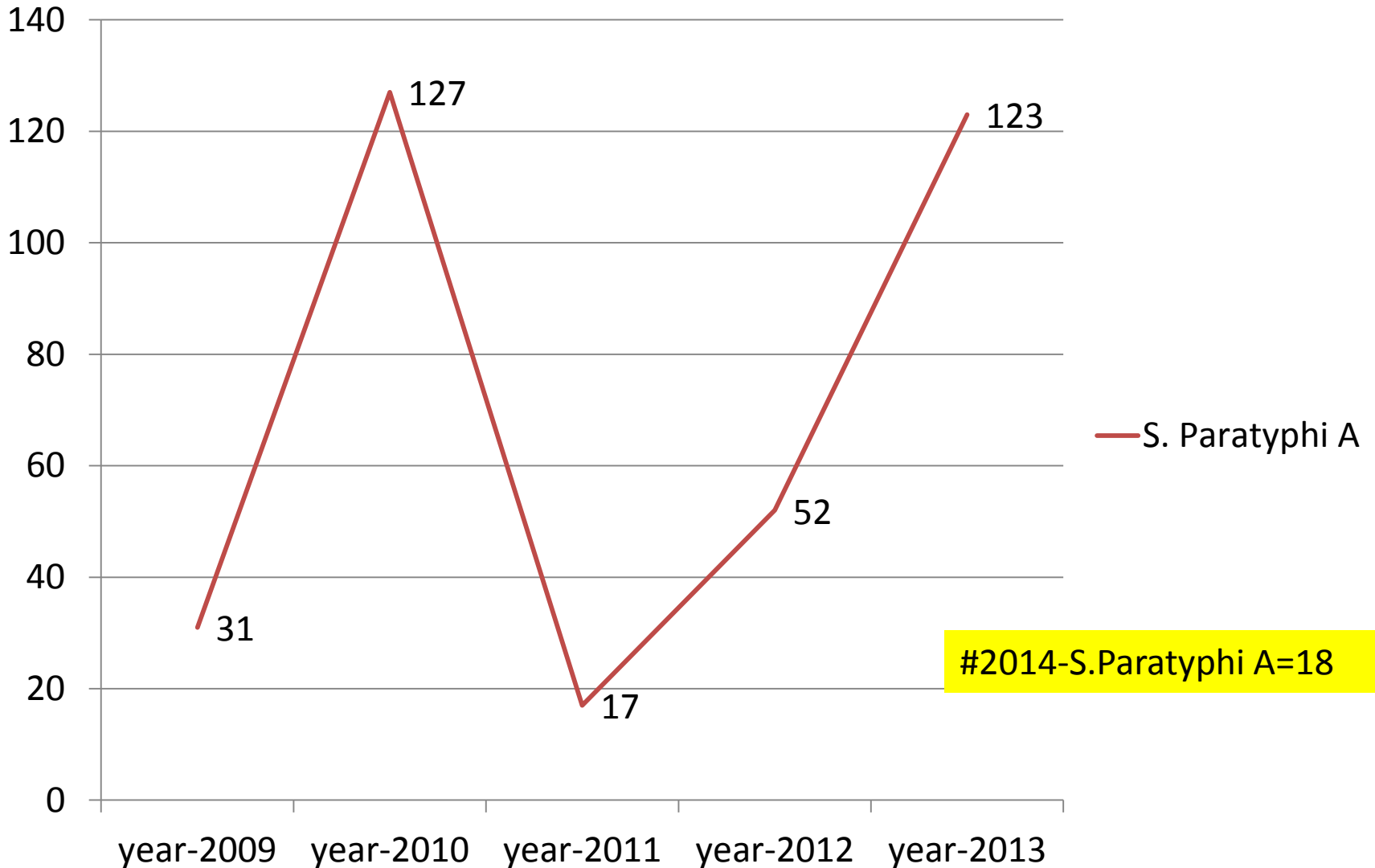
Table1: Total S.Typhi and S. Paratyphi A isolates in Om Hospital(2009-2013)

	S. Typhi	S.Paratyphi A	Total Salmonella
year-2009	32	31	63
year-2010	80	127	207
year-2011	13	17	30
year-2012	17	52	69
year-2013	92	123	215
Total	234	350	584(3.64%/16,039)
Percent	40	60	100

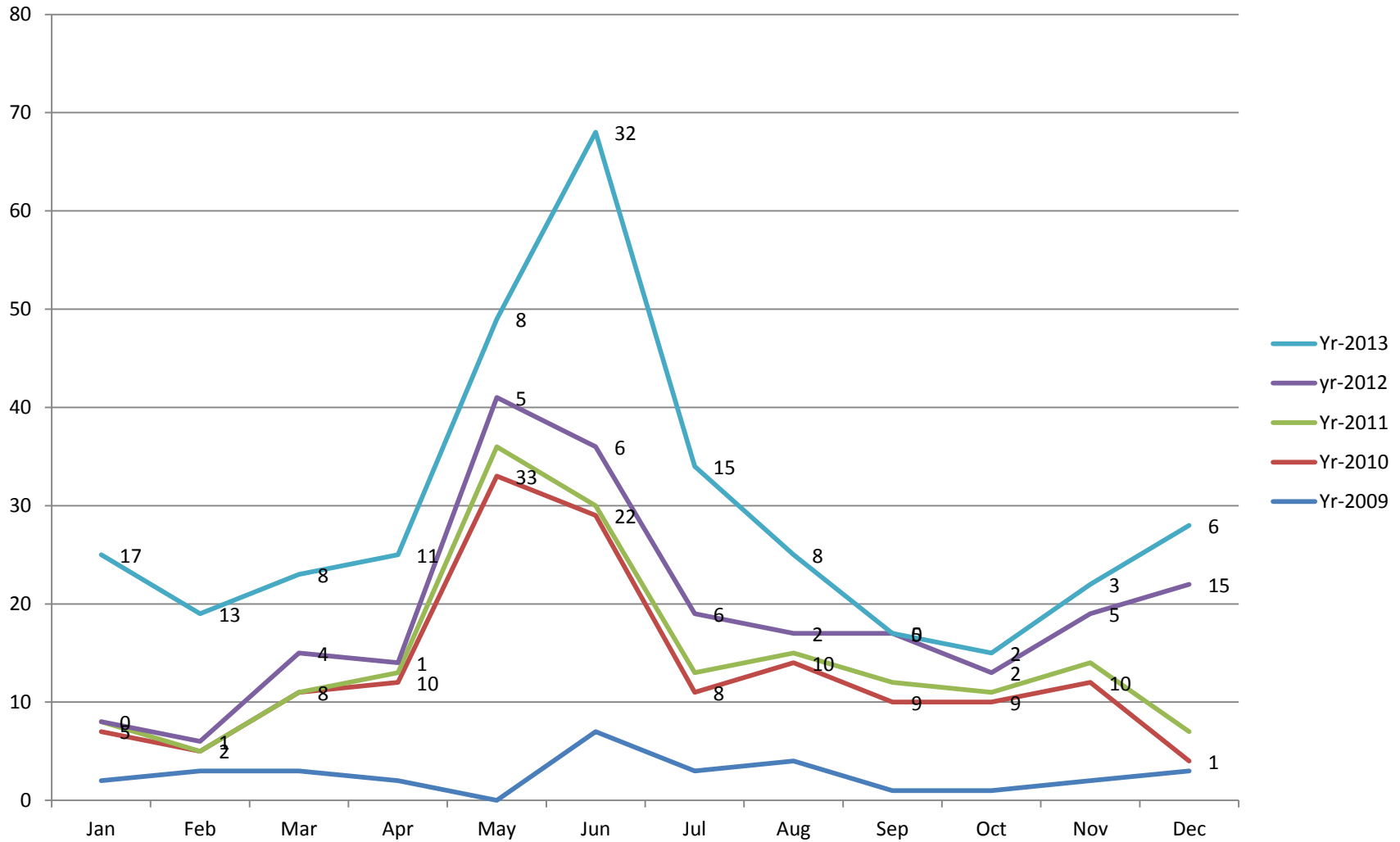
#2014: 27 S. Typhi and 18 S. ParatyphiA =45



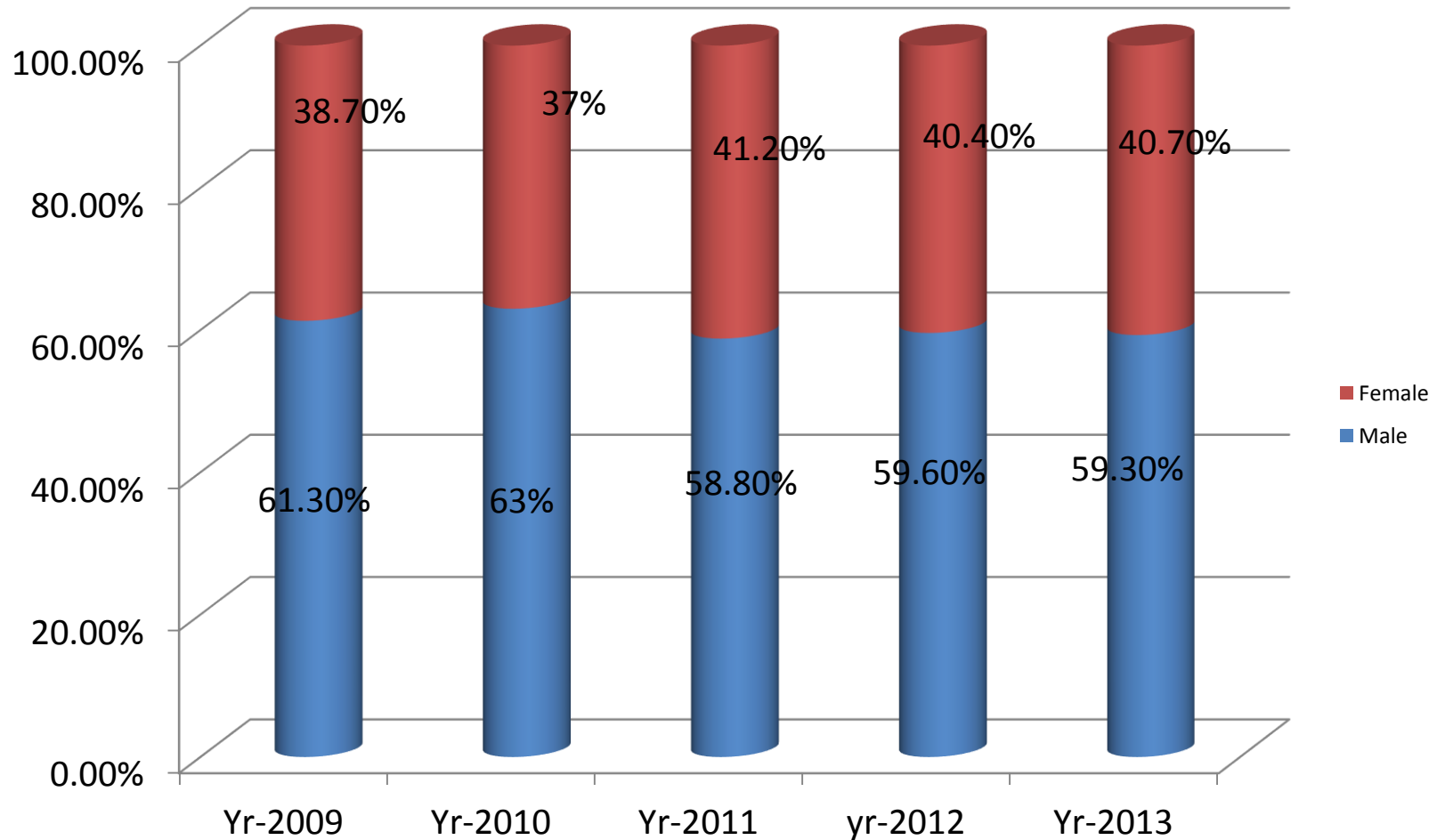
# Yearwise Distribution of S. Paratyphi A cases in Om Hospital(2009-2013)



# Monthwise Distribution of S. Paratyphi A cases in Om Hospital (2009- 2013)



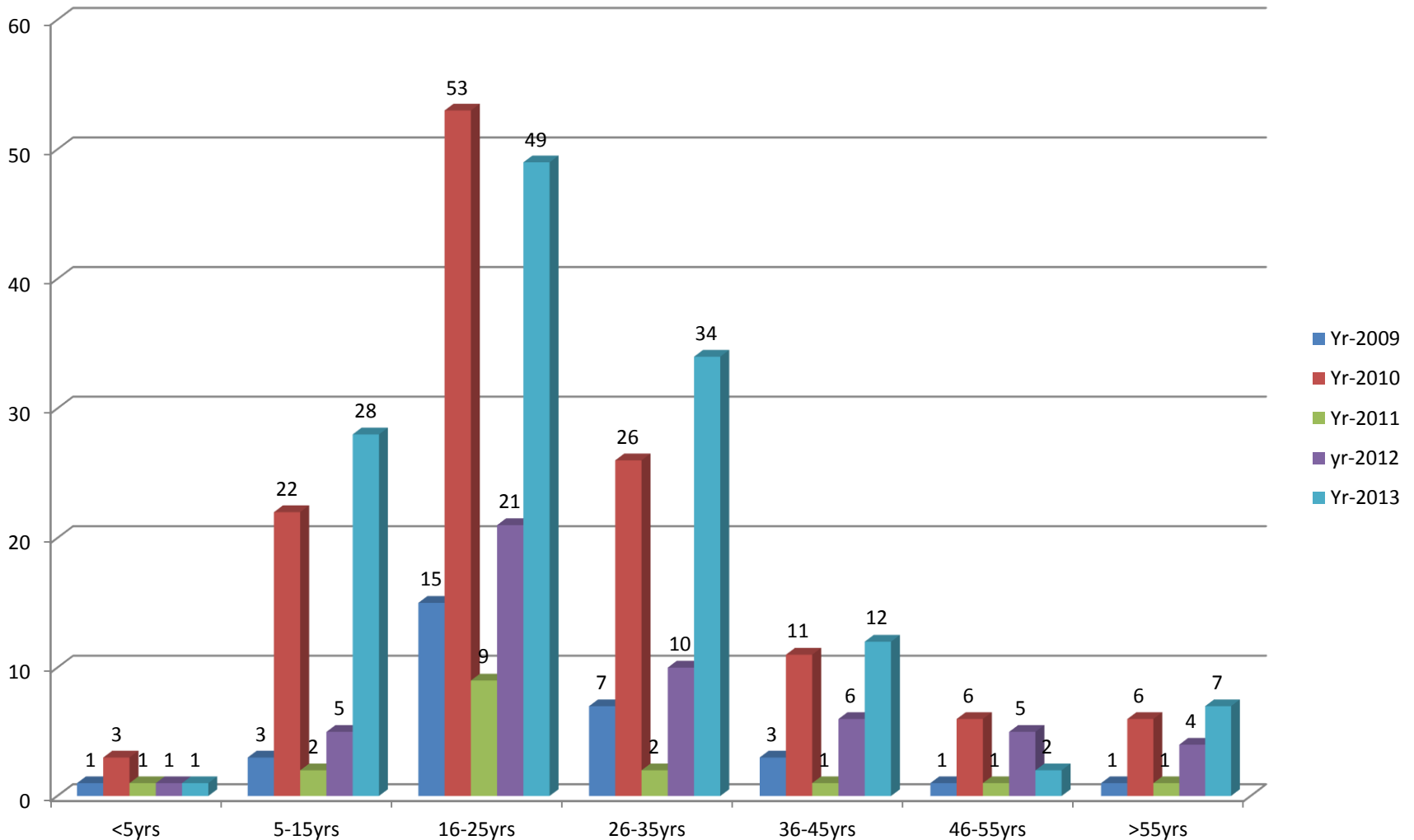
# Sexwise Distribution of S. Paratyphi A cases at Om Hospital (2009-2013)



#2014--Male(61.1%),Female(38.9%)

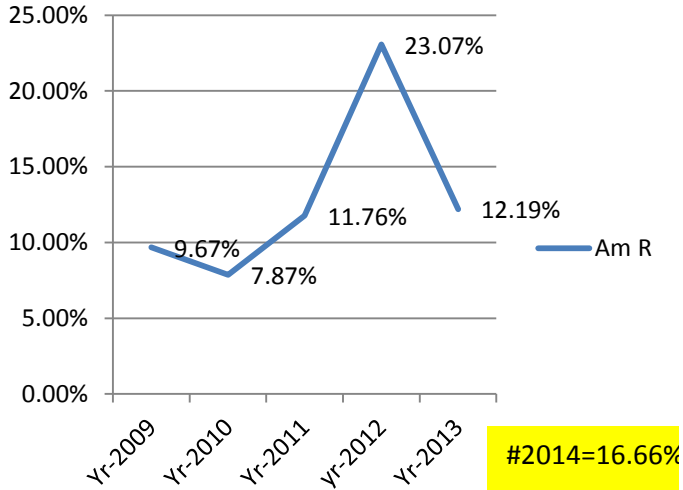


# Agewise Distribution of S. Paratyphi A cases at Om Hospital(2009- 2013)

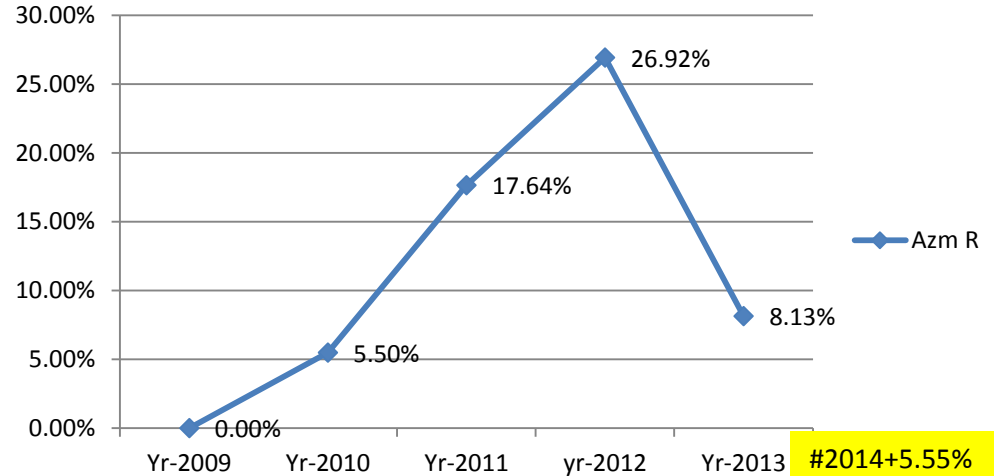


# Antibiotic resistant pattern of S.Paratyphi A at Om hospital (2009-2013) by Disc Diffusion method

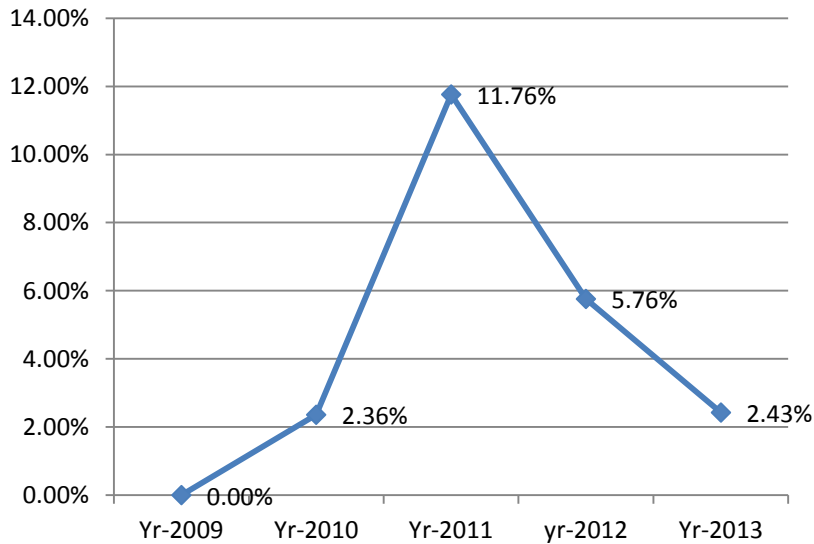
### Am R



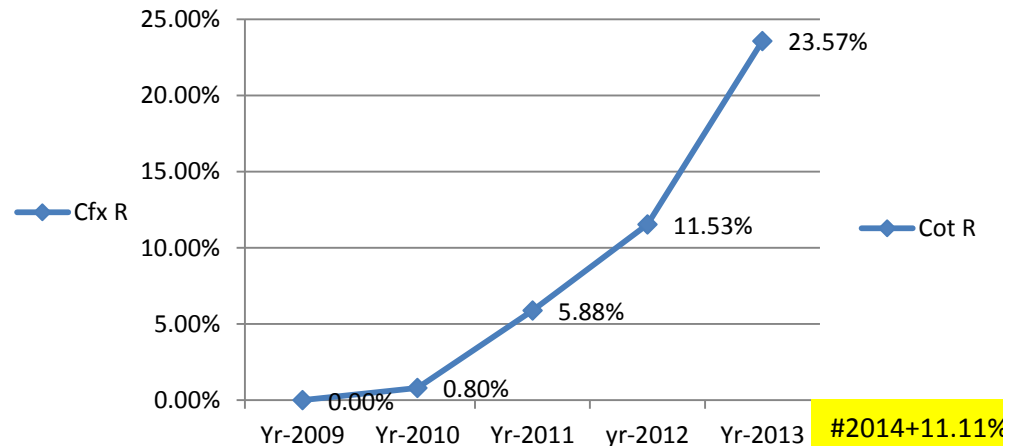
### Azm R



### Cfx R



### Cot R



#2014=0%

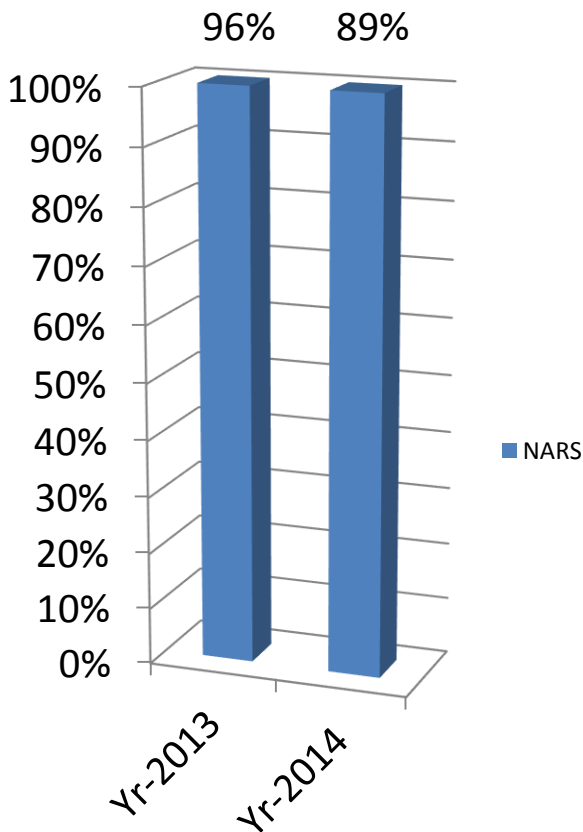
## Antibiotic sensitivity pattern of S. Paratyphi A (2009-2012) to Cf, Of, C, Cro according to CLSI guidelines 2011(HIMEDIA)

Years	CF	Of	C	Cro
	S	S	S	S
Yr-2009	100%	100%	100%	100%
Yr-2010	95%	95%	100%	100%
Yr-2011	94%	94%	100%	100%
Yr-2012	96.00%	96.00%	100%	98.00%

Cf=Ciprofloxacin, Of=Ofloxacin, C=Chloramphenicol, Cro=Ceftriaxone



## Frequency of Nalidixic acid resistant S. Paratyphi A at Om Hospital (2013-2014)



## Antibiotic sensitivity pattern of S. Paratyphi A (2013-2014) to Cf, Of, C, Cro according to CLSI guidelines 2012, Journal of Clinical Microbiology\*

	Cf	Of	C	Cro
	IS	IS	S	S
Yr-2013	85%	85%	100%	98%
Yr-2014	80%	80%	100%	100%

IS-Intermediate Sensitive

# Conclusion

- This study shows that Enteric fever due to *S. Paratyphi A* was / is more common than due to *S. Typhi* at this institution.
- Paratyphoid was prevalent throughout the year and among in all age and gender group and will remain so till there is significant improvement in sanitation and personal hygiene.
- Paratyphoid fever was seen more common among school-age children and young adults.
- There were no multidrug resistant cases, however ,morbidity was noted. To the best knowledge of the authors there was no mortality.
- There was very high incidence of Nalidixic acid Resistant *S.Paratyphi A* cases at this institution.

# Recommendations

- To cope with high number of paratyphoid enteric fever cases, significant improvement in sanitation and personal hygiene along with vaccination is needed.
- Vaccination for Typhoid and Paratyphoid should be priority programme of the Government of Nepal and it should be introduced in schools and made available to all who seek it as is evident from this study predominantly school-age children and young adults are affected ; as the results will be felt with reduction in no. of salmonella cases.
- Antibiotics should be prescribed only after Antimicrobial susceptibility test
- MIC and Molecular characterization of NAR S. Paratyphi A along with molecular mechanism of resistance and epidemiology should be done .



# Recommendations

- Regional and National level surveillances of paratyphi fever at community level is must, as most of enteric fever cases are treated in local pharmacies and health posts in Nepal
- Concerned authority should be very alert as enteric fever outbreak can occur in any season of the year(no seasonal variation)
- Treatment strategy of Nepal to enteric fever needs revision as there high number of NARS isolates and which is in increasing trend.

# Acknowledgement

I would like to thank:

- Om Hospital and Research Center
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- Patients visiting this hospital

