

# MACROLIDE RESISTANT *STREPTOCOCCUS PNEUMONIAE*: ASSOCIATION WITH SEROTYPE, SEQUENCE-TYPE (ST) AND ANTIBIOTIC CONSUMPTION

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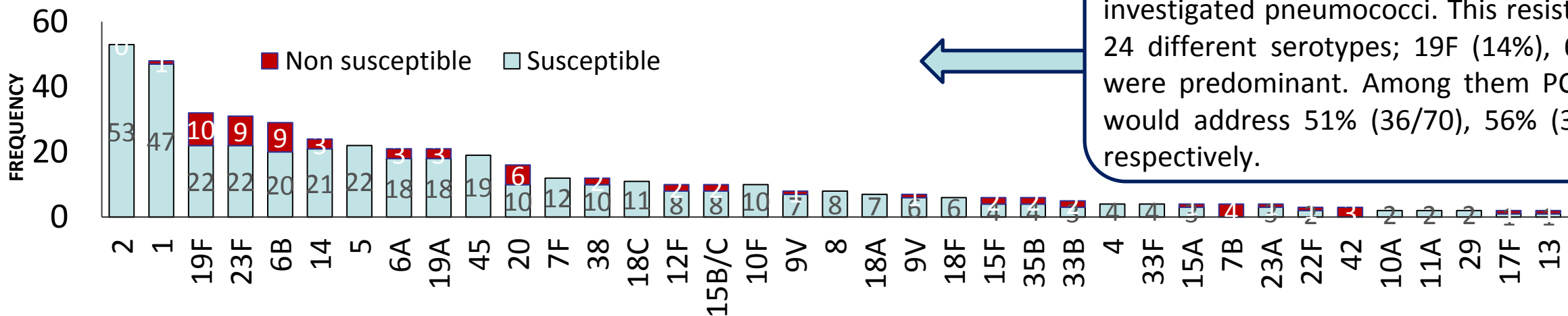
## BACKGROUND & AIMS

Azithromycin, a macrolide is a common and useful therapeutic for the treatment of community acquired pneumonia; but its long half-life encourages development of macrolide resistance in *Streptococcus pneumoniae* (1). Thus, it is threatening the effective prevention and treatment of pneumococcal infections and may lead to increased illnesses, deaths and disabilities eventually (2,3). Considering this, we investigated increasing macrolide-resistance among pneumococcus, with the aim of exploring the association of macrolide-resistance with serotype, clone and azithromycin consumption.

## METHODS

Between January-2002 to March-2015, 464 invasive pneumococcal isolates were collected and whole-genome sequenced as a part of the Global Pneumococcal Sequencing project. Macrolide non-susceptibility was determined by erythromycin disk-diffusion and E-test. Data on azithromycin consumption was gathered from IMS health report. Correlation between azithromycin consumption and macrolide resistance rate was assessed by Spearman correlation coefficient.

## RESULTS



Macrolide resistance was identified in 70 (15%) of total investigated pneumococci. This resistant population exhibited 24 different serotypes; 19F (14%), 6B (13%) and 23F (13%) were predominant. Among them PCV10, PCV13, and PCV20 would address 51% (36/70), 56% (39/70), and 63% (44/70) respectively.

Fig 1: Non susceptibility to macrolide among different serotypes

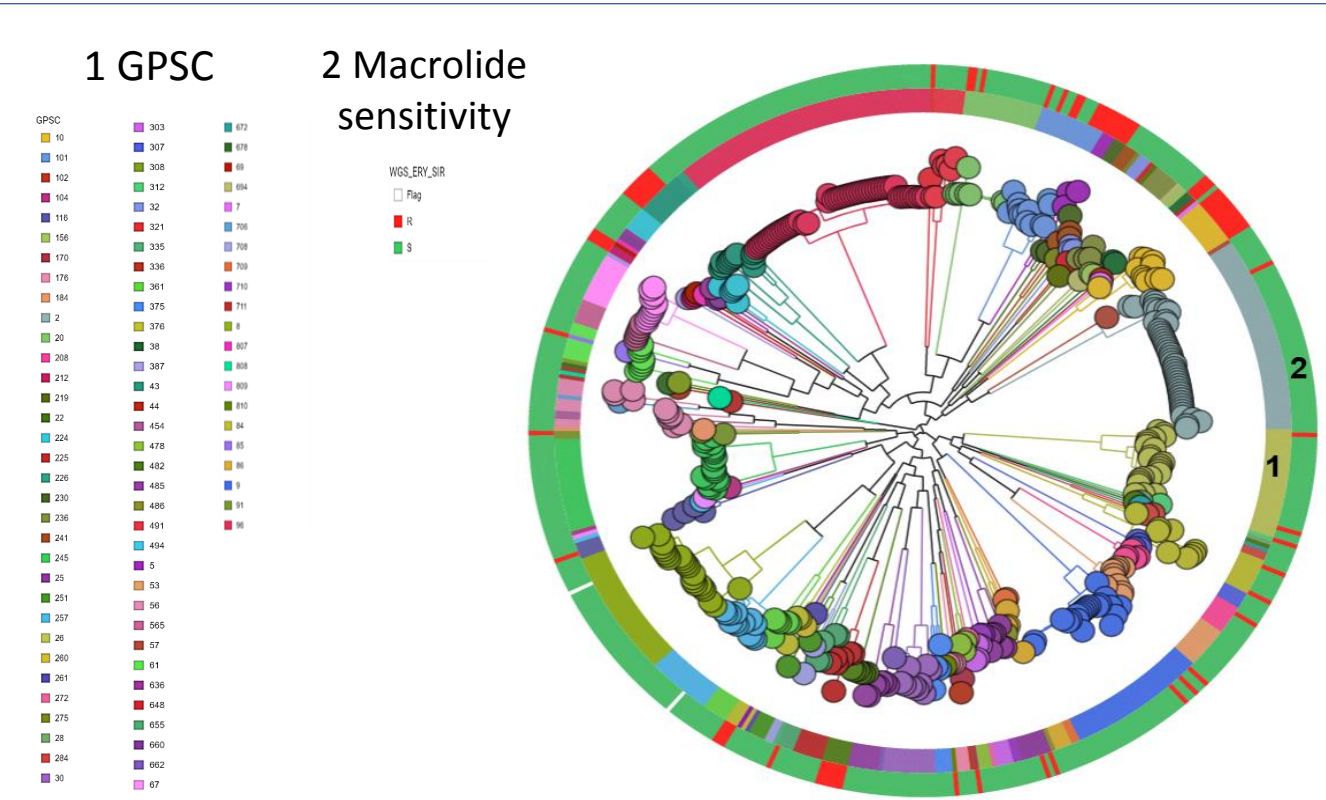


Fig:2 Among the investigated pneumococci, macrolide resistance belonged to 26 different Global Pneumococcal Sequence Clusters (GPSCs) and 42 STs. Dominant lineages were GPSC10 (ST1553, 12894, 14490, 14488), GPSC43 (ST4745, 3214), GPSC101 (ST2854, 1078) and GPSC482 (ST5612).

Increased azithromycin consumption showed direct association with increasing macrolide resistance. ( $r=0.8572$ ,  $p=0.0031$ , Spearman correlation coefficient).

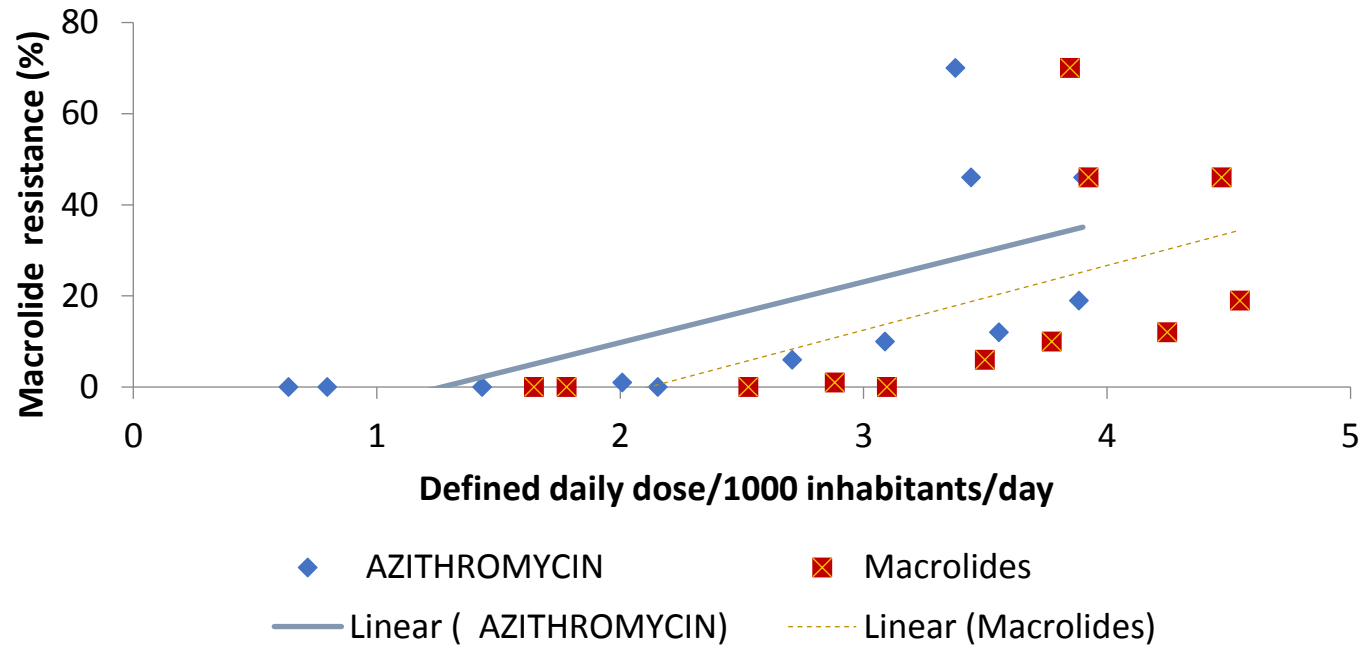


Fig 3: Correlation of macrolide resistance and azithromycin consumption

## CONCLUSION

Serotype and genotype diversity among macrolide-resistant pneumococci and low coverage addressed by PCVs suggests that a vaccine covering all strains or restricted consumption of azithromycin is needed to reduce the transmission of macrolide-resistant strains.

## REFERENCES

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