

Predominance of clonal complex 320 among invasive *Streptococcus pneumoniae* serotype 19F isolates from India in pre-vaccine era.

Dharmavaram sravani¹, Varun¹, Akshatha¹, Shincy, Geetha, Stephen D. Bentley², Rebecca A. Gladstone², Stephanie W. Lo², Robert F. Breiman³, Lesley McGee⁴, Ravikumar KL¹, and the Global Pneumococcal Sequencing Consortium

¹ Central Research laboratory, KIMS, Bangalore

² Infection Genomics, The Wellcome Trust Sanger Institute, Wellcome Trust Genome Campus, Hinxton, Cambridge, CB10 1SA, UK

³ Hubert Department of Global Health, Rollins School of Public Health, Emory University, Atlanta, GA 30322, USA

⁴ Respiratory Diseases Branch, Centres for Disease Control and Prevention Atlanta, GA 30333, USA

Contact: darmavaramsravani@gmail.com

Background and Aim:

Worldwide *Streptococcus pneumoniae* serotype 19F, often multi-drug resistant, has emerged as an important pathogen associated with invasive pneumococcal disease (IPD). The aim of the study was to characterize invasive serotype 19F isolates collected from India in pre-vaccine era.

Results

- Overall, 11 STs encompassing in 4 GPSCs and 3 clonal complexes (CCs) were identified. The most prevalent strain of serotype 19F was GPSC1 (n=31, CC320), followed by GPSC10 (n=3, CC10879).
- CC320 was the major clonal complex (n=33) with ST236 (n=7), ST271 (n=7), ST320 (n=7), ST2697 (n=7), ST2854 (n=2) and ST651, ST1396, ST8359 (n=1 each).
- A majority of GPSC1 isolates (30/31) had pilus 1 & 2 while GPSC10 isolates were negative for both.
- All GPSC1 isolates and GPSC10 isolates were resistance to at least three antibiotic classes

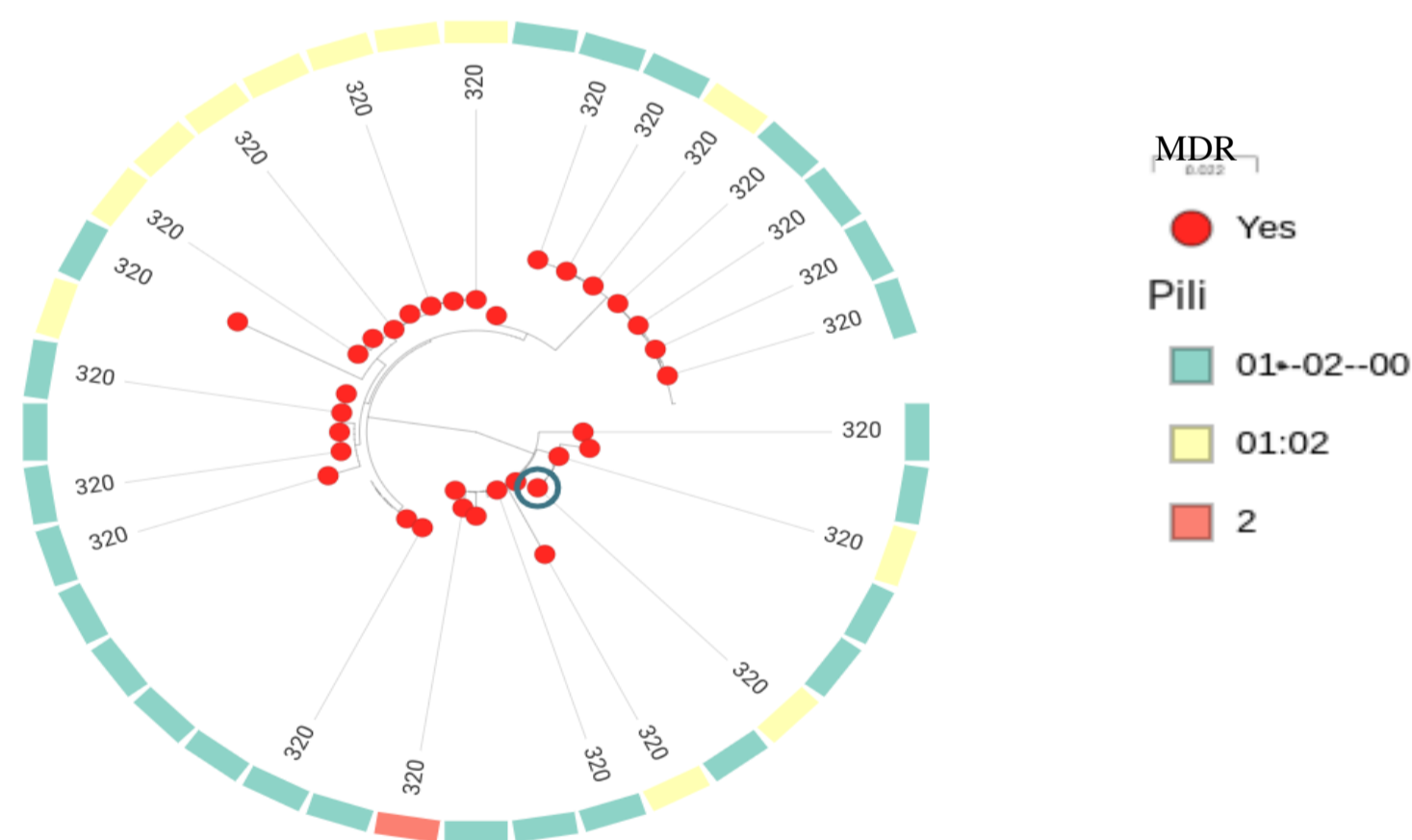


Fig 3: Population snapshot of 19F isolates

Methods

Among 480 pneumococcal isolates collected across India from 2010-2018, 38 belonged to serotype 19F (8%). These were sequenced on Illumina Platform. The sequence data was analysed for serotype, clonal complex, pilus islets and MLST using the CDC pipeline

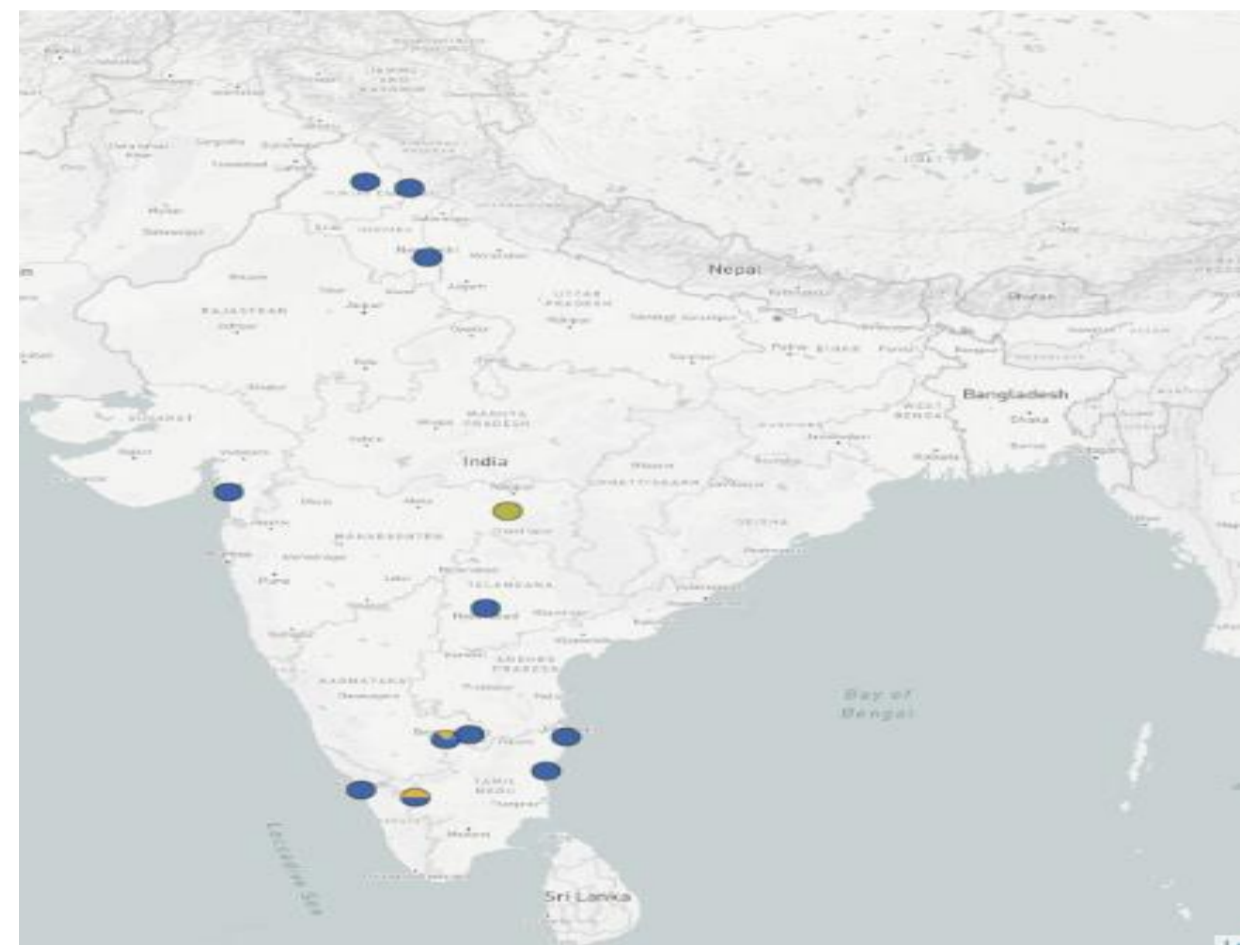


Fig 1: Geographic Distribution of 19F isolates.

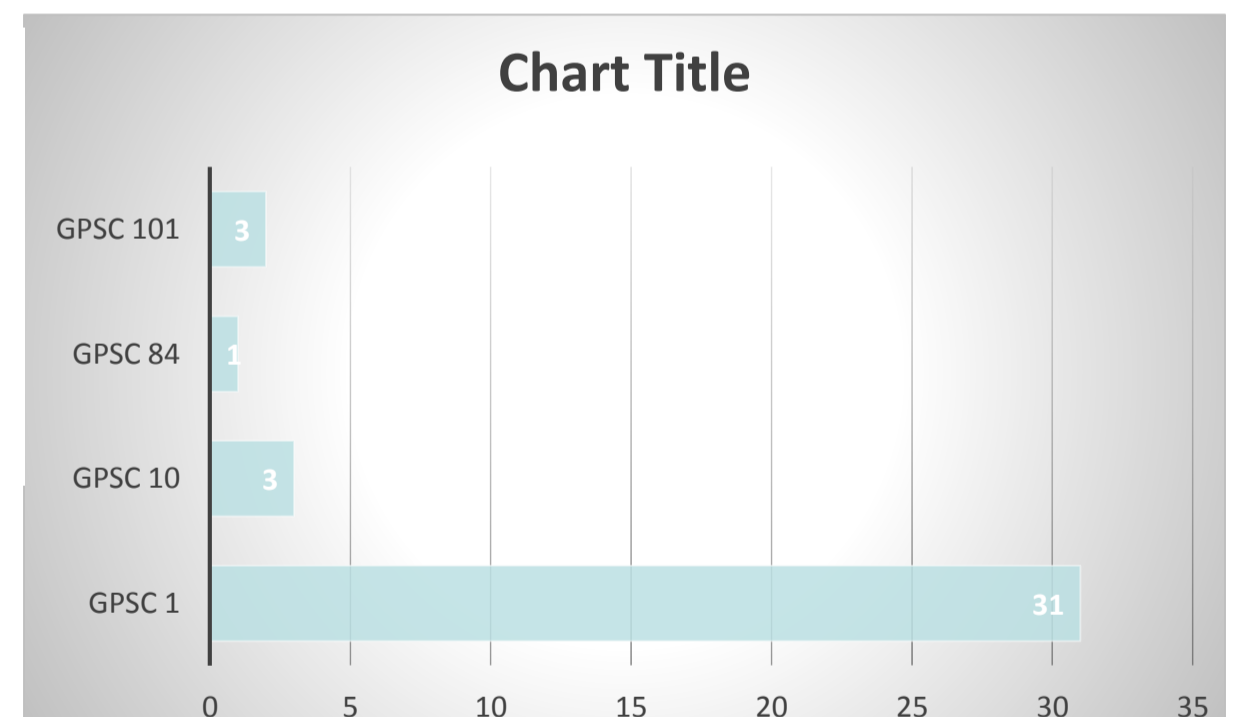


Fig 2: Percentage of GPSC Strains

Conclusion

- This analysis identified CC320 as the major lineage among serotype 19F isolates pre-PCV vaccination in India.
- Overall, serotype 19F isolates were found to be multi-drug resistant with a high percentage of pili genes present.

Reference:

1. Hawkins, Paulina A et al. Antimicrobial resistance determinants and susceptibility profiles of pneumococcal isolates recovered in Trinidad and Tobago. *Journal of global antimicrobial resistance* vol. 11 (2017): 148-151. doi:10.1016/j.jgar.2017.08.0042.
2. Mott, M P et al. Emergence of serotype 19A *Streptococcus pneumoniae* after PCV10 associated with a ST320 in adult population, in Porto Alegre, Brazil. *Epidemiology and infection* vol. 147 (2019): e93. doi:10.1017/S0950268819000013.