

GLOBAL GENOMIC EPIDEMIOLOGY OF PNEUMOCOCCAL SEROTYPE 2 ISOLATES: 1989-2022

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Background

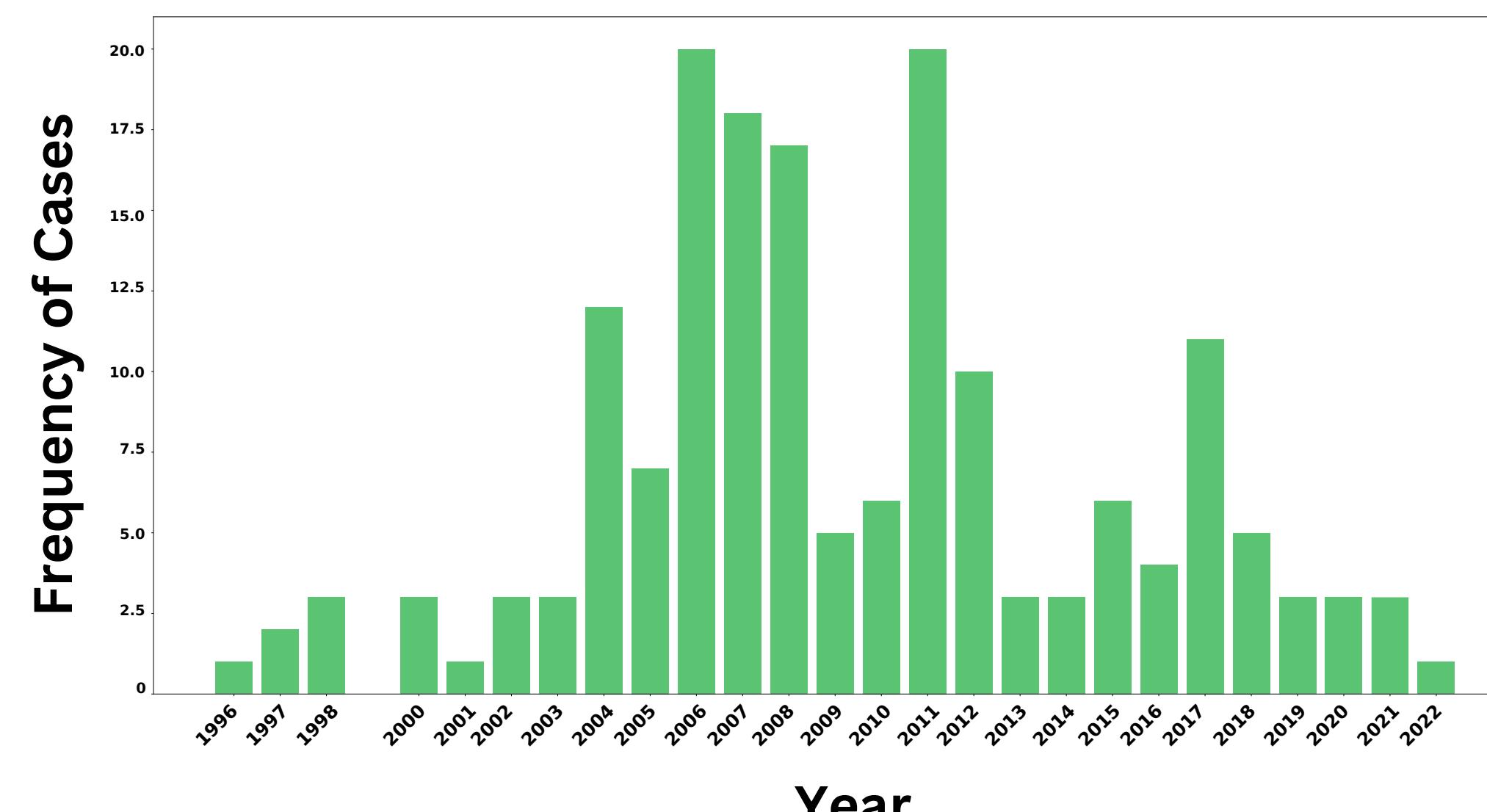
Serotype 2 was a major cause of invasive pneumococcal disease (IPD) in the late 19th/ early 20th century. Since the 1990s, while relatively rare, serotype 2 IPD cases have been reported in some countries, including Bangladesh, Israel, and Papua New Guinea.

Objective

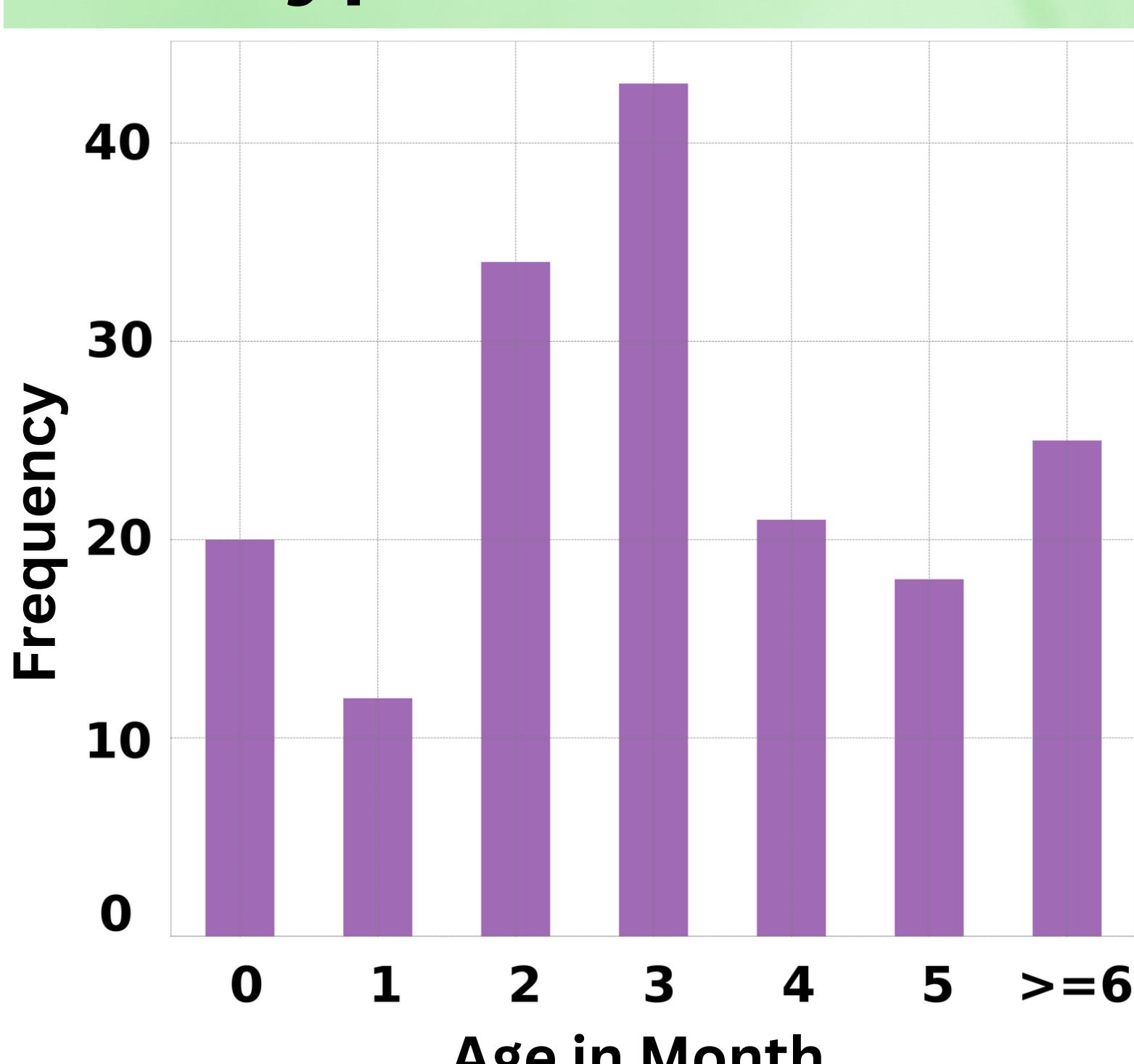
This study investigated genomic and epidemiological characteristics of a global collection of serotype 2 isolates.

Yearly Distribution of IPD Cases Attributable to Serotype 2

Serotype 2 is the second most common IPD serotype in Bangladesh (173/2227, 7.768%)
Serotype 2 outbreak seen 2006-2008, 2011



Clinical Features of IPD cases Attributable to Serotype 2

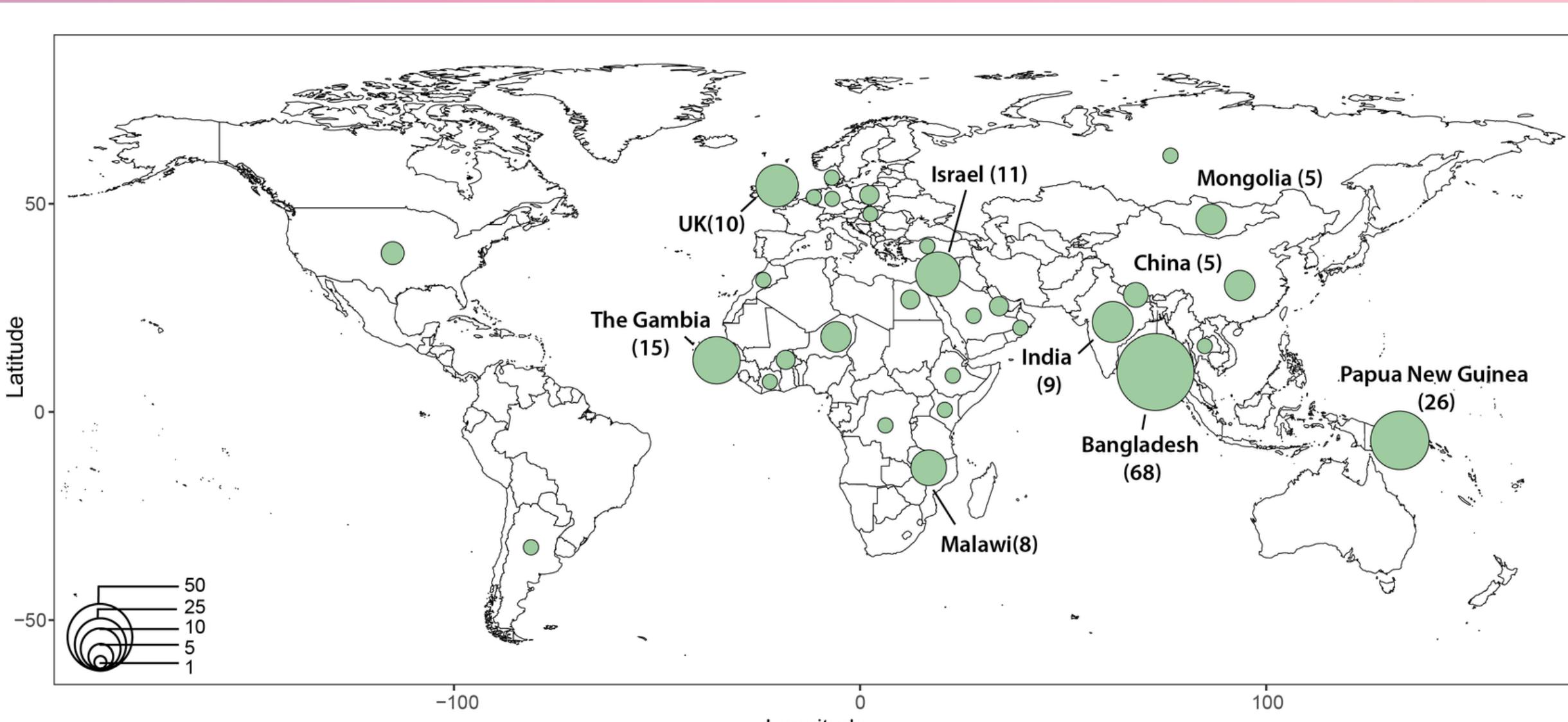


The median age of the Serotype-2 IPD is 3 month (95% CI: 3.97 to 8.94). Whereas the median age of all IPD is 7 month.

Clinical Feature	Frequency	Percentage (%)
Case Definition		
Meningitis	113	88
Very Severe Disease	9	7
Not Eligible	3	2.3
Missing	2	1.5

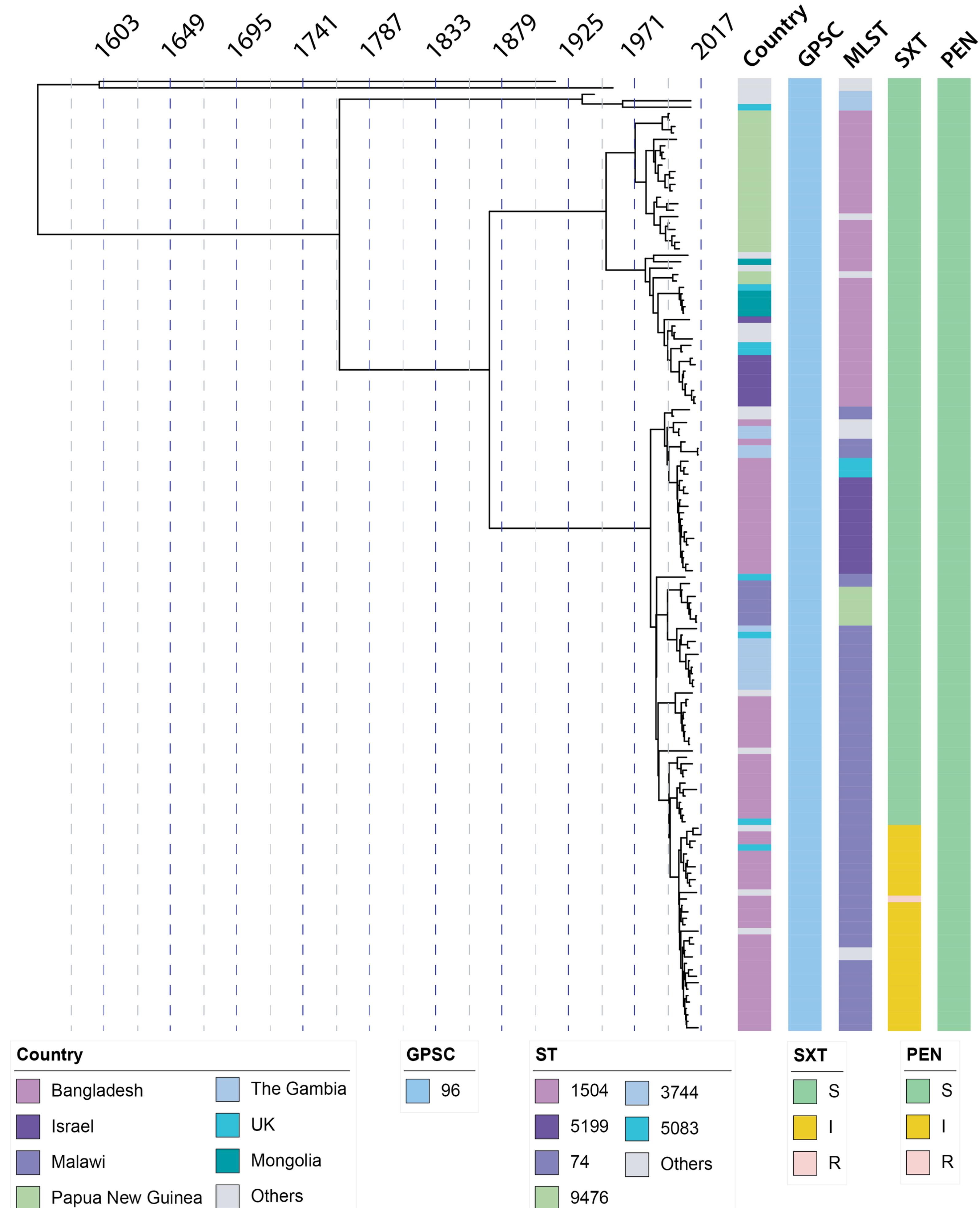
Clinical Feature	Frequency	Percentage (%)
Outcome		
Died	16	9.1
Discharged	137	78.28
DORB	17	9.7
Missing	5	2.8

Global distribution of Serotype 2 genome (n = 192)



Serotype 2 isolated from 31 countries were collected. Circles correspond to the number of genomes. Countries with >5 genomes are labelled.

Phylogenomic analysis of Serotype 2 isolates (n=149)



All strains belonged to GPSC 96. Within the GPSC, two major clades were found: ST74, ST5199 in Bangladesh, The Gambia and Malawi and ST1504 in Papua New Guinea and Israel.

Conclusions

Results suggest that global serotype 2 isolates have low genetic diversity, belonging to a single GPSC. Most serotype 2 isolates remain susceptible to antibiotics and were predominantly invasive, with very few carriage isolates documented. Inclusion of serotype 2 in future PCV formulations may enhance the effectiveness of vaccines against IPD.

References:

- Saha SK et al, POLS ONE 2012, 7(3): e32134
- Dagan R et al, Clin Infect Dis 2021, 73(11): e3768-e3777



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