

# Longitudinal surveillance reveals high clonality of pneumococcal carriage in the first year of life in The Gambia

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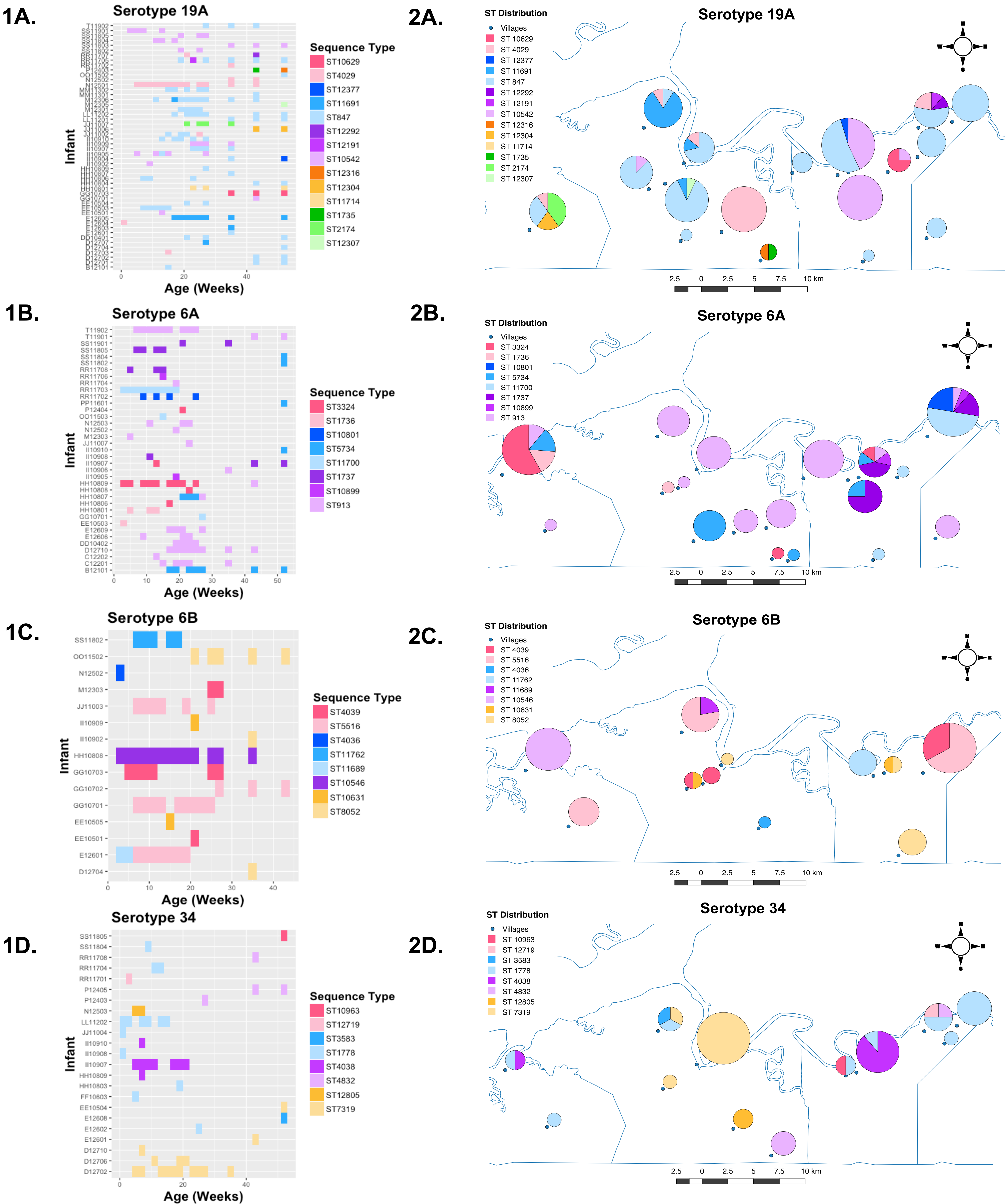
## Introduction

- Pneumococcal carriage induces a protective anticapsular antibody response in adults
- However, the protective effect of carriage in infants is unknown
- To understand pneumococcal carriage in the first year of life whole genome sequencing was conducted to determine levels of clonality

## Methods

- 98 infants across 21 villages in The Gambia aged 0-1 year old
- Biweekly nasopharyngeal swabs collected from 0-6 months and every month from 6-12 months
- Serotype and sequence type (ST) were inferred from the genome
- The ST's for given serotypes within each village were identified and plotted against village GPS coordinates

## Results



- The main serotypes carried longitudinally during the first year of life, in Gambian infants, were 19A (150, 14.0%), 6A (106, 9.9%), 6B (64, 6.0%), 23B (48, 4.5%) and 34 (48, 4.5%)
- Colonisation was clonal within subjects: same genotype colonised infants at successive visits (**Figure 1A-D**)
- Clonality was also observed at the village level (**Figure 2A-D**)
- Some infants switched carriage strain when they travelled and were recolonized upon their return

## Discussion

Pneumococcal carriage in the first year of life in rural Gambia is clonal and villages are associated with clonal lineages. Interestingly, Marabout villages, which large numbers of people visit for spiritual healing, had the highest ST diversity. Isolates belonging to the same ST recovered from a subject at different times differed in the core genome, suggesting that infants may not be protected against re-colonisation of the same serotype.

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**Figure 1: Longitudinal carriage of STs for serotypes commonly carried by infants.** The ST's identified for each infant carrying serotypes 19A (1A), 6A (1B), 6B (1C) and 34 (1D) at each visit during their first year of life.  
**Figure 2: The geographical distribution of STs for four serotypes carried by infants in rural Gambia.** The ST's identified for serotypes 19A (2A), 6A (2B), 6B (2C) and 34 (2D) within each village. The size of each pie chart is proportionate to the frequency of the serotype's carriage within infants.