Nasopharyngeal Carriage of *Streptococcus pneumoniae* Serotype 6A/6B in Gambian Infants is Highly Dynamic Within the First year of Life: A longitudinal Study

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Introduction

- *Streptococcus pneumoniae* serotypes 6A and 6B are associated with invasive disease and commonly carried in young children in The Gambia
- Prevnar (PCV7) protects against serotype 6B; however, the extent at which it cross-protects against serotype 6A is not fully understood
- We studied the impact of PCV7 on carriage and genotypic diversity of serotypes 6A and 6B among infants in The Gambia (Fig 1 & 2)

Study design

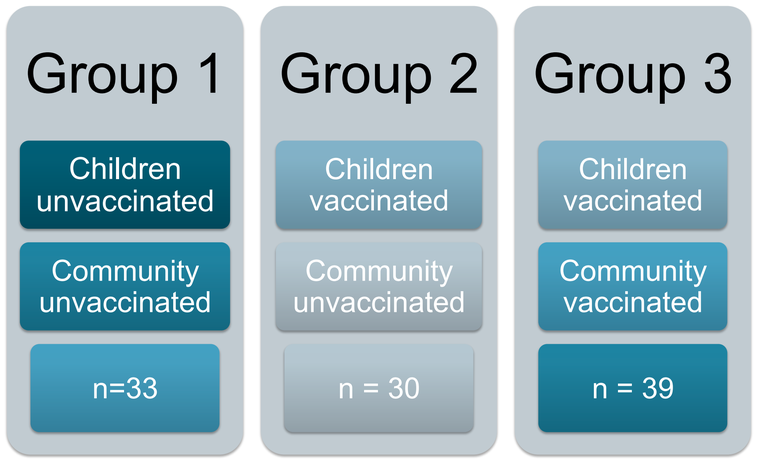

Figure 1. A schematic showing study design and study population. ** Group 1 children vaccinated after 6 months. Group 2 and 3 children vaccinated at weeks 9, 13 and 17 (**Kwambana-Adams et al., 2017**)*

Materials and Methods

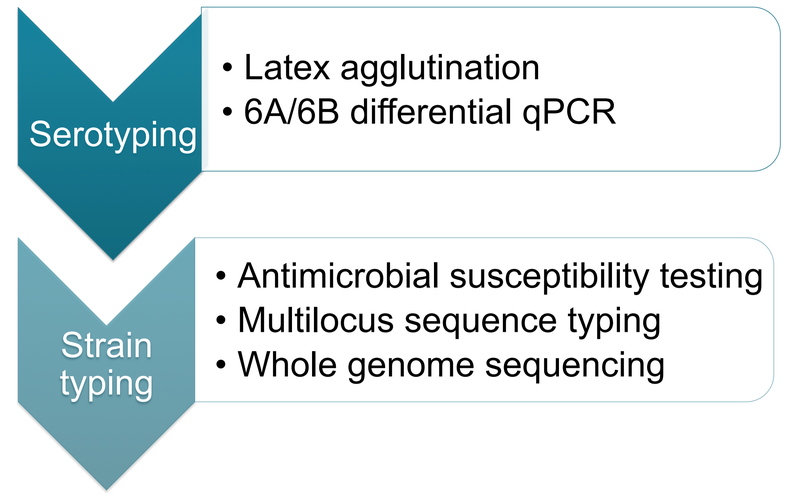

Figure 2. Schematic showing methods implemented in the analysis of data.

Results

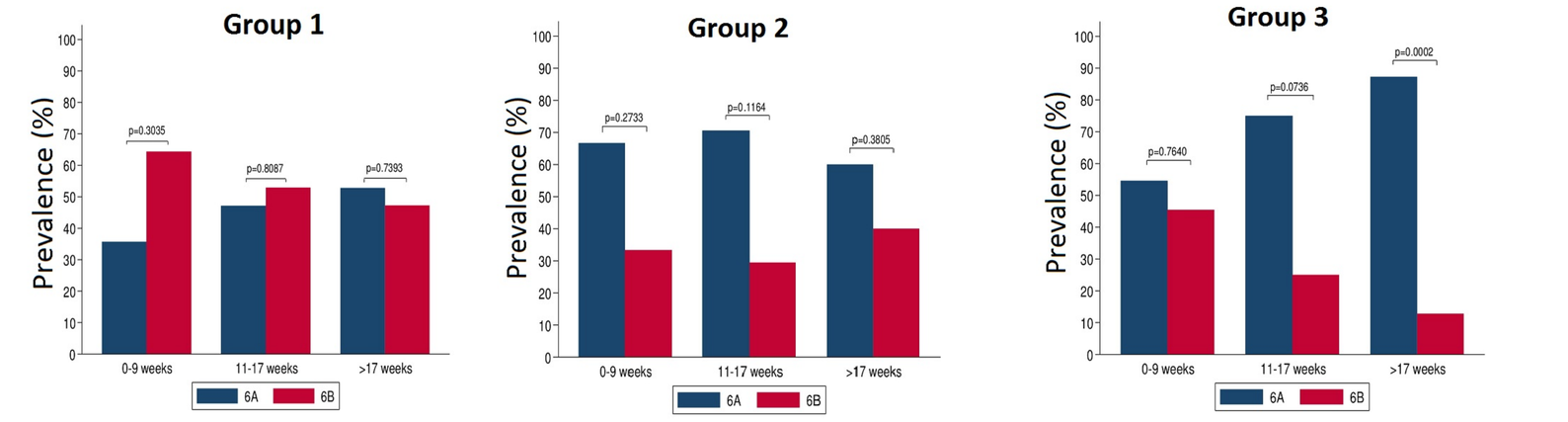

Figure 3. Carriage prevalence of 6A and 6B by groups pre-vaccination (0-9 weeks), vaccination (11-17 weeks) and post vaccination (>17 weeks). *After adjusting for multiple testing using the Bonferroni correction method, the cut of P-value was 0.0056.*

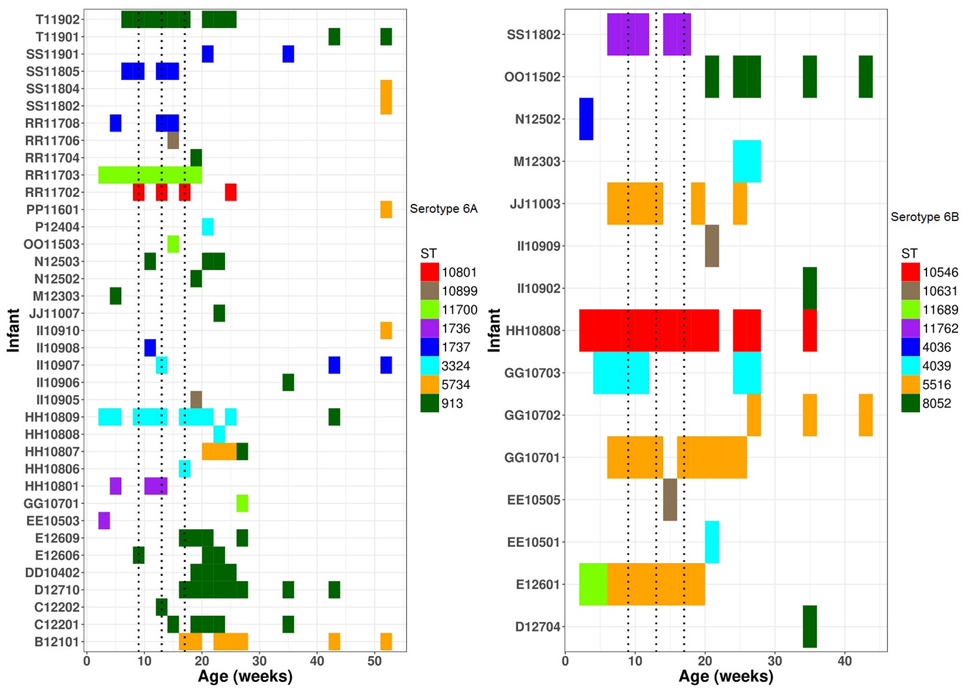

Figure 4. Distribution of sequence types of 6A and 6B pre, post and during vaccination. *The dotted lines shows the time-points of administration of the 1st, 2nd and 3rd doses of the PCV7 vaccine.*

- 1595 nasopharyngeal swabs were collected from 102 infants
- Pneumococcus 1258 (78.9%): 6A/ 6B 220 (17.5%)
- 6A carriage was significantly higher than 6B carriage in vaccinated infants (Fig 3).
- Carriage appeared to be clonal within individuals and at community level **(Fig 4)**
- Infants colonised by the same strain; occasional switching
- Tetracycline and trimethoprim resistance: Disc diffusion - 45.7% 94.9% and E-test - 33.9% and 40.7% respectively

Whole genome phylogeny

- Whole genome phylogeny shows a close relationship between serotype 6A and serotype 6B (Fig 5)
- Strains within an individual were conserved

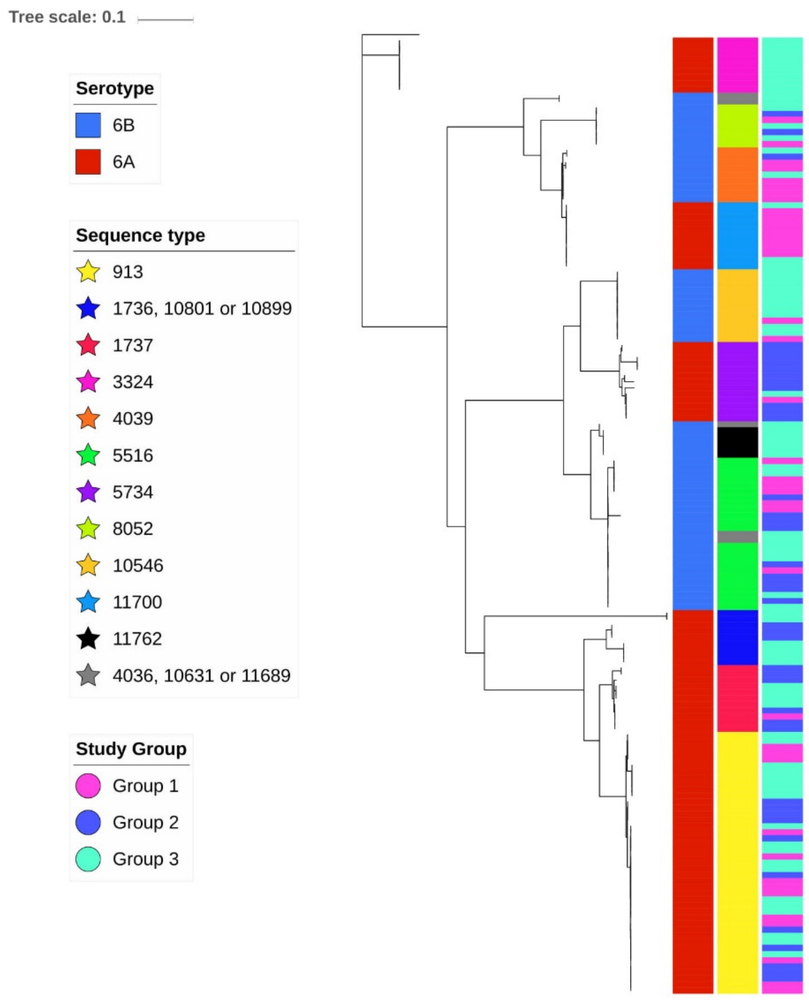

Figure 5. Phylogenetic tree of 170 serotype 6A and 6B isolates. Phylogenetic tree annotated with serotype, MLST and study group information.

Conclusions

- PCV7 does not appear to have reduced carriage of serotype 6A as reported in previous studies; however, longer periods of study will be required to ascertain this finding
- Carriage of 6A and 6B is highly dynamic in infants and includes cloud diversity within host
- Continued monitoring of vaccine effect on carriage is crucial for feature vaccine advocacy

Acknowledgements

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