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Carriage dynamics of *N. meningitidis* and *N. lactamica* over 12-months in UK adolescents

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Background

Invasive meningococcal disease (IMD) usually occurs shortly after initial colonisation with *Neisseria meningitidis* (Nm); however, Nm carriage may persist after several months and contribute to the spread of IMD-associated variants. Colonisation with *N. lactamica* (NI) may protect against Nm colonisation. This study describes longitudinal patterns of Nm and NI carriage in UK students aged 16-19 years over 12 months.

Aim/Methods

Oropharyngeal swabs were collected at 0 and 12 months from control (unimmunised) participants in the 'Be on the TEAM' study (ISRCTN 75858406) in 2018-19. Isolates obtained following culture underwent conventional serogroup characterisation (B, C, W, Y) prior to WGS, annotation and curation on the pubMLST.org/neisseria website. Only participants who were carriers at either or both timepoints were included.

Results

At baseline, 3.5% (114/3260) of participants were carriers of Nm and 0.74% (24/3260) carried NI. At 12-months, carriage of Nm was 5.40% (176/3260) and NI 0.64% (21/3260). 31% (35/114) of Nm carriers at baseline also carried Nm at 12-months and of these 85% (30/35) matched by sequence type (ST) and fine-typing. Hyperinvasive clonal complexes comprised 47% (14/30) of persistent carriage isolates. The most common persistently carried isolates by clonal complexes were: ST41/44 (n=7); ST-198 (6); ST-32 (3); ST-1157 (3) and ST-213 (3), and by genogroup were: cnl (14); B (10); E (5); Y(1). The ST-198 (cnl) isolates clustered more closely than ST41/44 isolates (mean core loci allelic difference 115 vs 1117). No capsule switching was observed over the study. 1/114 baseline Nm carriers cultured NI at 12-months, whilst 68% (108/114) at 12-months carried no *Neisseria* spp. 25% (6/24) of NI carriage persisted at 12-months and 8.3% (2/24) of baseline NI carriers cultured Nm at 12-months.

Conclusions

A rise in Nm carriage occurred over 12-months, consistent with other adolescent studies. There was no significant change in NI carriage. Carriage of any Nm in sequential UKMenCar school carriage studies has declined from 16.6% in 1999, whereas NI carriage has remained similar. Persistent carriage of Nm over 12-months was common, and half of these persistent isolates were closely related to hyperinvasive IMD-associated clonal complexes.

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[N. meningitidis and N. lactamica carriage dynamics at baseline and 12 months](#)

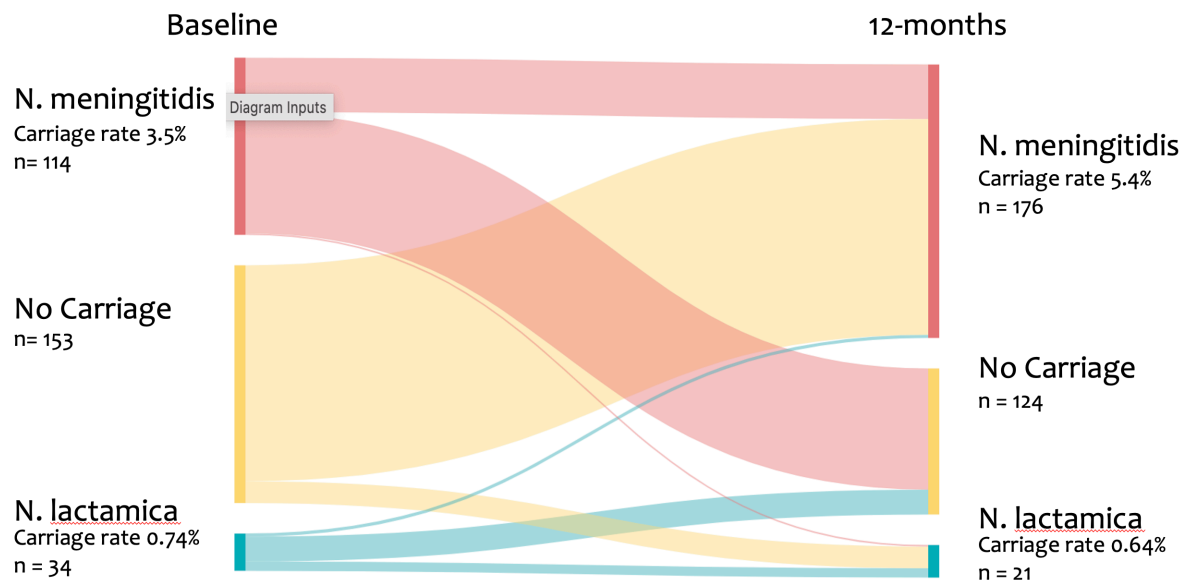


Figure 1. Carriage dynamics between baseline and 12-months. Total study size N = 3260. “No Carriage” depicts only those participants that carried *N. meningitidis* or *N. lactamica* at either timepoint. 2966 participants were non-carriers at both timepoints (not shown due to scale).