Background
Management strategies based on airway inflammation phenotypes are increasingly used for adults with asthma. While sputum-based phenotypes are relatively stable in adults with asthma, there is little such data in childhood asthma. Hence, we aimed to evaluate the stability of inflammatory phenotypes in children with asthma both in the stable and during exacerbation phases.

Methods
Sputum cellularity data from two previous prospective studies involving children with asthma were combined and categorized into two inflammatory phenotypes: eosinophilic (>2.5% eosinophils) and non-eosinophilic (≤ 2.5% eosinophils). Baseline values and follow-up sputum inflammatory phenotype classification were compared in children with asthma during stable and exacerbation phases.

Conclusion
In children with asthma, sputum inflammatory phenotypes are variable in both stable and exacerbation phases, in contrast to data in adults.

Results
Eighteen of 41 children (44%) with stable asthma demonstrated a change in sputum inflammatory phenotype at median of 8-weeks (range 5-24 weeks) later. Both sputum eosinophils and neutrophils % increased and peaked on day one of asthma exacerbation but compared to baseline, 22% (2/9) and 13% (1/8) of children had sputum phenotype categorization change on day one and day three of exacerbation, respectively.

Figure 1
Sputum eosinophils (A) and neutrophils (B) data for individual children across two timepoints during stable phase

Figure 2
Sputum eosinophils (A) and neutrophils (B) from baseline to day-1 and day-3 of an asthma exacerbation for individual children

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