Title: Speech breathing pattern analysis in adults with a self reported history of asthma

Body: Background: While speech and breathing patterns are known to alter in acute episodes of respiratory disorders like asthma, it is not known if they alter in respiratory pathology, during stable periods of the disease. Aims and objectives: To compare speech breathing patterns in healthy adults and those with a self reported history of asthma. Methods: Eleven adults with a self reported history of asthma (mean age = 29) and 29 'healthy' adults (mean age = 34) with no history of respiratory disease were recruited from the University of Southampton. Breathing patterns were recorded non-invasively using Respiratory Inductive Plethysmography during 4 minutes each of quiet breathing, and 3 speech tasks: reading, describing and conversation. Offline analysis was performed where 6 breathing parameters were extracted; inspiration and expiration time ($T_I$, $T_E$), breath cycle time (Ttot), inspiration and expiration magnitude (IM, EM), and respiratory rate (RR). Results: Inspiration time was significantly shorter at the 95% level in the asthma group (mean: 0.52, sd: 0.07) compared with the 'healthy' participants (mean 0.66, sd 0.12) ($t$: 3.27, $p = 0.002$). Although no statistically significant differences were found in other parameters, the asthma group had a higher mean RR during all speech tasks compared to the healthy group. Conclusion: These preliminary findings suggest that ventilatory patterns during speech in adults with a self-reported history of asthma are characterised by a shorter $T_I$ and faster RR compared to 'healthy' participants. Research with larger samples is needed to confirm these initial findings, as breathing patterns during structured tasks like speech could be useful for monitoring lung health.