southern African population, the GLI ‘race neutral’ equation did not provide best fit to the data. This may reflect both genetic and social determinants of lung health. There is an urgent need to not only ensure that global standards for lung function interpretation perform well across different ethnic groups, but that they are validated in globally representative data.

Please refer to page A288 for declarations of interest related to this abstract.

**S133 QUALITY OF PRIMARY CARE SPIROMETRY ACCORDING TO ATS/ERS 2019 STANDARDS AND INTER-EXPERT AGREEMENT ON THEIR APPLICATION**

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**Introduction** The American Thoracic Society and European Respiratory Society (ATS/ERS) updated their spirometry technical standards in 2019 with the intention of increasing the accuracy, precision and quality of spirometry. We assessed the technical quality of primary care spirometry according to ATS/ERS 2019 standards and evaluated inter-expert agreement on application of these standards.

**Methods** Two hundred consecutive spirometry sessions performed by non-physiologist respiratory practitioners using a ndd EasyOne Plus spirometer in primary care-based clinics in Hillingdon Borough (Northwest London), were independently assessed by three expert respiratory physiologists. Each physiologist was part of the Association for Respiratory Technology and Physiology (ARTP) leadership, and each had >10 years of experience leading a lung function department. For each curve, FEV1 and FVC were assessed for acceptability and usability, and then the FEV1 and FVC grades for the overall spirometry session were determined according to the ATS/ERS 2019 standards (A,B,C,D,E,F,U). For this analysis, we classified sessions with grades A or B (at least two acceptable traces within 0.150L) as ‘good’ quality, and grades C,D,E,F,U as ‘suboptimal’.

**Results** According to ATS/ERS 2019 standards, an average of 54% and 29% of sessions were classified as ‘good’ quality for FEV1 and FVC respectively, with only 28% of sessions achieving ‘good’ quality for both FEV1 and FVC. There was moderate agreement between experts on the determination of FEV1 classification (kappa 0.57 [95%CI: 0.48–0.66], 79% agreement), and FVC (kappa 0.52 [95%CI: 0.42–0.62], 81% agreement). For FEV1, full consensus (agreement from all 3 experts) was achieved in 136 (68%) sessions (73 ‘good’; 63 ‘suboptimal’ quality). For FVC, full consensus was achieved in 142 (71%) sessions (30 ‘good’ and 112 ‘suboptimal’ quality).

**Conclusions** The technical quality of primary care spirometry is largely suboptimal. Furthermore, amongst expert respiratory physiologists, there is only moderate agreement on FEV1 and FVC quality grading using the ATS/ERS 2019 standards. This suggests subjectivity in how experts apply the standards which is likely to be amplified when applied by less expert primary care practitioners. Tools and strategies are needed to support better quality spirometry and standardise spirometry quality assessment, particularly in primary care where most spirometry is conducted.

Please refer to page A288 for declarations of interest related to this abstract.

**S134 EUPNOOS: ADVANCING EARLY DIAGNOSIS OF RESPIRATORY DISEASES WITH SMARTPHONE-BASED AUDIO PHENOTYPING**

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**Background** Early detection of airway disease is an important public health priority with an urgent need for simple diagnostic tools that are easier to deploy than spirometry. Eupnoos has developed an audio phenotyping platform that is capable of detecting spectral patterns in audio data recorded using the MEMS microphone on a smartphone. The algorithms identify and quantify distinct spectral features within human breath sounds potentially facilitating early diagnosis.

**Methods** We performed a small-scale research study in conjunction with the University of Southampton (ERGOII 70867) and Care Ashore, with a view to testing the diagnostic accuracy of the Eupnoos technology platform.

The collected dataset consisted of 43 participants who performed three forced expiratory manoeuvres into the MEMS sensor of a mobile phone. The audio files were filtered down to 36 usable files, with one file per participant; for six participants the audio files were unusable and left out during the processing.

The collected data was processed to extract several acoustic spectral features. These features (n=22) were used as inputs into a gradient-boosting classification model with a binary output. Model accuracy was assessed by applying a repeated K-fold cross-validation.

**Results** The audio phenotyping platform can demonstrate excellent specificity but limited sensitivity in the classification of both asthma and COPD (figure 1). The mean AUC score (SD) is 0.64 (0.056) for asthma and 0.786 (0.169) for COPD. Algorithm development and model accuracy were limited by the small number of disease cases, necessitating further development of the spectral algorithm in incident asthma and COPD populations.
Conclusion The results demonstrate promising accuracy in using audio phenotyping for diagnosing asthma and COPD. This work serves as an early proof of concept, highlighting the potential of utilising breath sound to phenotype respiratory diseases.

Please refer to page A288 for declarations of interest related to this abstract.