

# Supplementary materials

## Methods

### Study participants

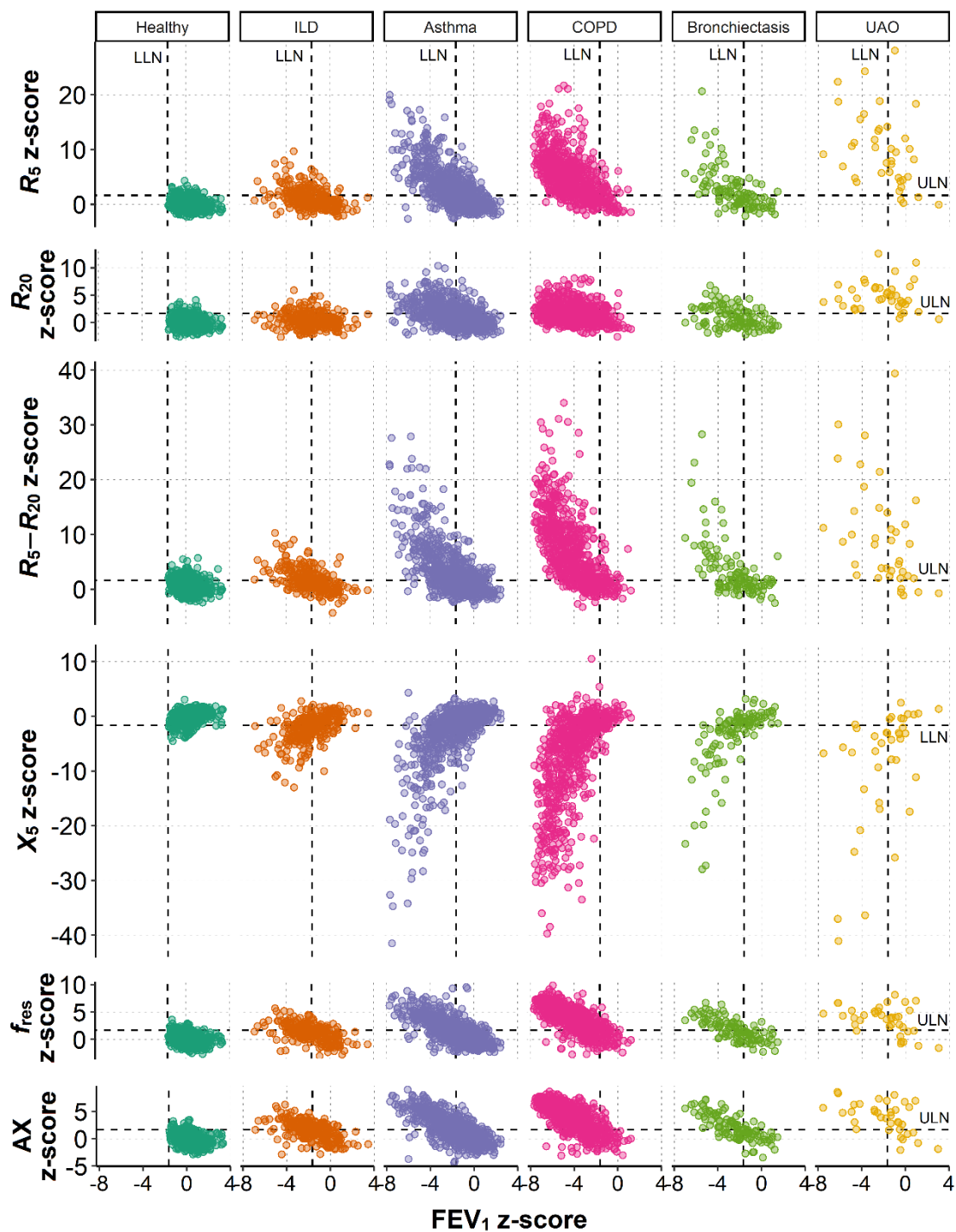
Patients were excluded with the following criteria: 1) the diagnosis was not supported by the relevant medical records; 2) combined other respiratory diseases (except for UAO combined lung tumour); 3) combined severe cardiovascular diseases or systematic diseases.

### Procedures

Through a case report form, physicians or technicians at the laboratory recorded the basic demographics; smoking history; allergies; occupational exposures history; comorbidities; respiratory symptoms; exacerbations; medications, and examinations (chest radiography, electrocardiography, echocardiography, bronchoscopy, or histopathological examination) of the participants. COPD patients and asthmatic patients were required to respectively fulfil the modified Medical Research Council (mMRC) [1] dyspnoea grade as well as the COPD Assessment Test (CAT) [2], and the Asthma Control Test (ACT) [3].

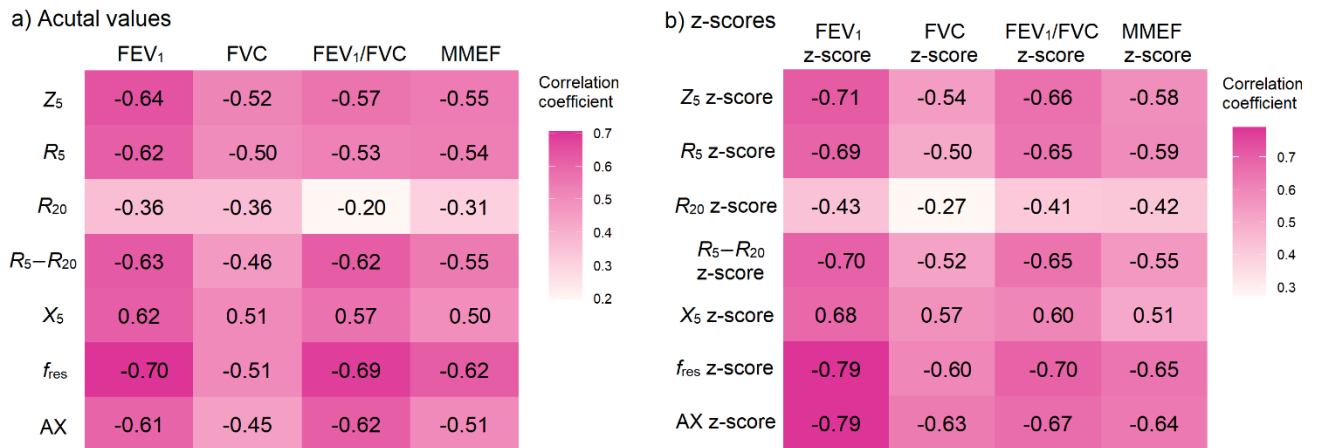
## Results

Figure S1 Scatter plots between z-scores of oscillometric parameters and FEV<sub>1</sub> z-score



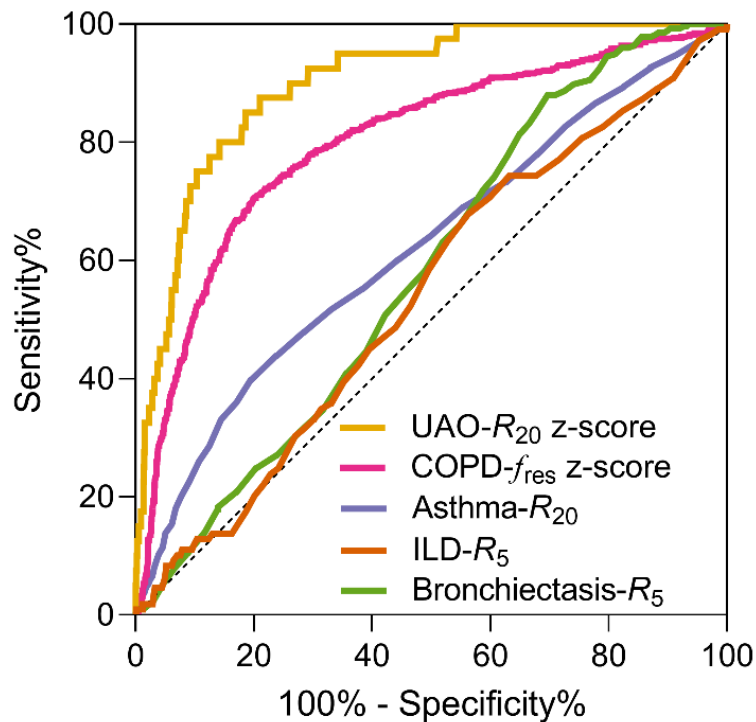
ULN: upper limits of normal=1.645. LLN: lower limits of normal=-1.645.

**Figure S2** Correlation between the oscillometric parameters and spirometry parameters

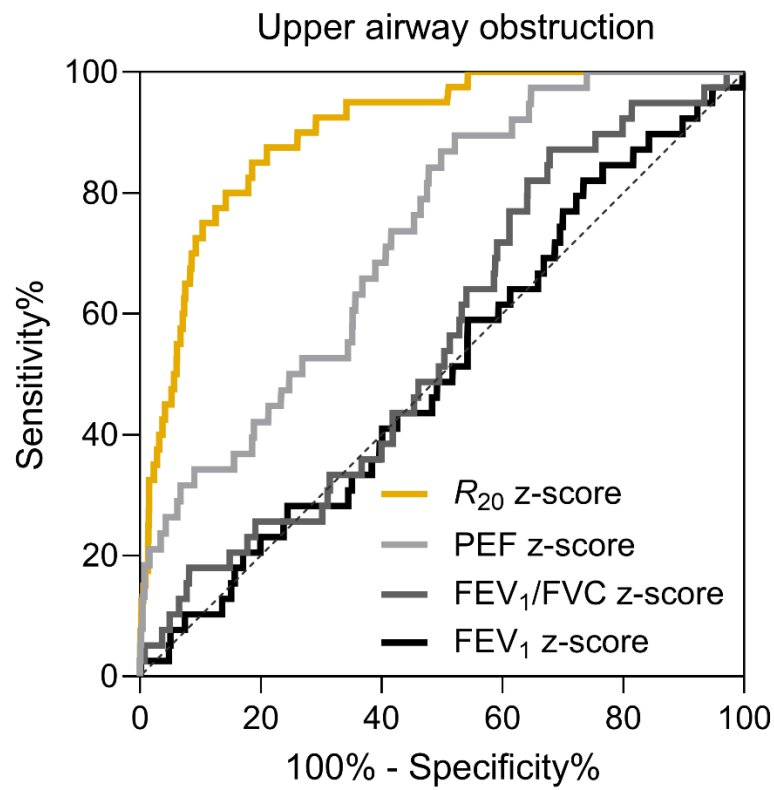


The correlation coefficients were derived from the Spearman correlation analysis, *P* all <0.05.

**Figure S3** The best oscillometric parameters in diagnosing each respiratory disease



**Figure S4** Comparisons of the diagnostic performances between  $R_{20}$  and spirometric parameters in identifying upper airway obstruction.



**Table S1** Diagnostic values of the best oscillometric parameters in diagnosing specific respiratory disease

	Variable	AUC (95% CI)	<i>P</i>	Cut-off	Sensitivity	Specificity
UAO	$R_{20}$ z-score	0.895 (0.852, 0.938)	<0.01	>2.300	87.5	79.0
COPD	$f_{res}$ z-score	0.807 (0.789, 0.826)	<0.01	>2.590	70.6	50.7
Asthma	$R_{20}$	0.620 (0.596, 0.645)	<0.01	>0.346	39.7	80.6
ILD	$R_5$	0.580 (0.549, 0.612)	<0.01	$\leq$ 0.450	88.0	30.4
Bronchiectasis	$R_5$	0.536 (0.482, 0.590)	0.148	>0.335	67.9	43.7

AUC: area under the curve; 95%CI: 95% confidential interval.

## References:

1. Bestall JC, Paul EA, Garrod R, Garnham R, Jones PW, Wedzicha JA. Usefulness of the Medical Research Council (MRC) dyspnoea scale as a measure of disability in patients with chronic obstructive pulmonary disease. *Thorax* 1999; 54: 581–586.
2. Jones PW, Harding G, Berry P, Wiklund I, Chen WH, Kline Leidy N. Development and first validation of the COPD Assessment Test. *Eur. Respir. J.* 2009; 34: 648–654.
3. Nathan RA, Sorkness CA, Kosinski M, Schatz M, Li JT, Marcus P, Murray JJ, Pendergraft TB. Development of the Asthma Control Test: A survey for assessing asthma control. *J. Allergy Clin. Immunol.* 2004; 113: 59–65.