Supplementary Table 1 Comorbidities within the sample.

Healthy		Mild		Moderate		Severe	
Comorbidity	Freq.	Comorbidity	Freq.	Comorbidity	Freq.	Comorbidity	Freq.
asthma	1	DM2	1	asthma	1	asthma	1
Brugada syndrome	1	Eagle's syndrome	1	DM2	1	atrial fibrillation	1
COPD	3	IPB	1	RGE	1	COPD	1
Henoch-Schonlein purpura	1	Kidney stone disease	1	arterial hypertension	5	DM2	4
IPB	1	abdominal aortic aneurism	1	bipolar disorder	1	Neuropathy	1
polyglobulia	1	adenoidectomy	1	dyslipidaemia	2	polyneuropathy	1
allergy	1	allergy	1	hyperprolactinemia	1	aortic sclerosis	1
arterial hypertension	1	aortic sclerosis	1	psicosis	1	arterial hypertension	4
bruxism	1	arterial hypertension	6	rheumatoid arthritis	1	cholelithiasis	1
cardiopathy	1	autism	1	thyroidectomy	1	chronic respiratory failure	1
diurnal somnolence	2	bipolar disorder	1			diurnal somnolence	1
dizziness	1	breast carcinoma	1			diverticulosis	1
extrasystole	1	chronic hepatitis	1			dyslipidaemia	3
gonarthrosis	1	diurnal somnolence	1			essential tremor	1
hepatomegaly	1	dyslipidaemia	2			hyperuricemia	1
hiatal hernia	1	epilepsy	1			ischemic cardiopathy	1
hypothyroidism	1	fibromyalgia	1			migraine	1
meningioma	1	phlebitis	1			nephrectomy	1
migraine	1	hypothyroidism	1			pacemaker	1
renal failure	1	memory impairment	1			urinary tract carcinoma	1
		migraine	1			ventricular hypertrophy	1
		Morton's neuroma	1				
		ophthalmopathy	1				
		pacemaker	1				
		paroxysmal supraventricular tachycardia	1				
		prostatic carcinoma	1				
		rheumatoid arthritis	1				
		tonsillectomy	2				

Supplementary Table 1 shows comorbidities' frequency in the sample, stratified by AHI severity class.

Supplementary Figure 1. Contribution of each descriptor to algorithms' performance
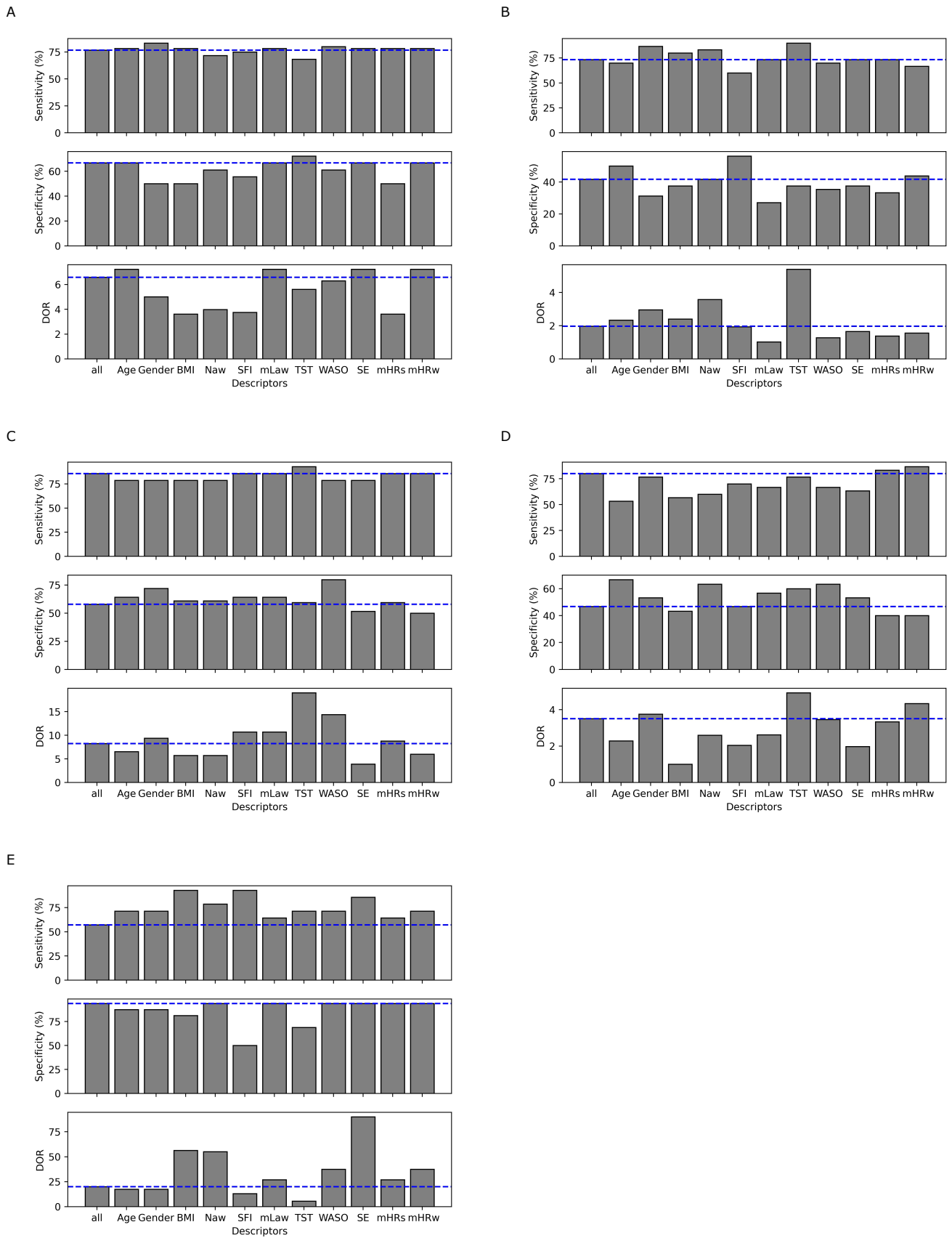

Supplementary figure 1 depicts the contribution of each descriptor to sensitivity, specificity, and diagnostic odds ratio (DOR). The pairs of algorithms were retrained excluding during each training round one descriptor (along x axis). The procedure was repeated 5 times, one for each AHI<5 vs AHI≥5 (A), AHI<15 vs AHI≥15 (B), AHI<30 vs AHI≥30 (C), Mild vs Moderate -Severe (D) and Moderate vs Severe (E) classification. Sensitivity, Specificity and DOR were further reported in the case in which no descriptor was dropped (All). A blue dotted line was added in each plot to better understand whether the algorithms achieved a better or worse performance if trained on a dataset having a dropped descriptor.

Supplementary Table 2 Patients' main characteristics				
Descriptor		Mean (sd)	r	p-value
Age			0.161	0.158
Gender	F	17.16 (17.41)		0.407
	M	14.28 (14.28)		
BMI			0.230	0.042*
Naw			0.106	0.358
SFI			0.043	0.710
mLaw			-0.021	0.858
TST			-0.223	0.050*
WASO			0.020	0.860
SE			-0.133	0.245
mHRs			0.117	0.306
mHRw			0.033	0.773
Dyslipidaemia	Yes	33.99 (28.78)		0.115
	No	13.76 (12.82)		
DM2	Yes	36.25 (13.88)		0.103
	No	13.96 (27.31)		
Hypertension	Yes	16.53 (11.28)		0.700
	No	18.61 (21.82)		

The table shows the results of the correlations between AHI and the descriptors (i.e., age, BMI, Naw, SFI, mLaw, TST, WASO, SE, mHRs, mHRw), as well as the comparisons between mean AHI in groups identified by gender and comorbidity status. Only comorbidities present in more than five participants (i.e., dyslipidemia, type 2 diabetes mellitus, arterial hypertension) were included in the analysis. Pearson test was run to correlate AHI with quantitative variables, Student t test for group comparisons. AHI mean and standard deviation in each group and Pearson r coefficient are reported. BMI was positively correlated with AHI, while TST was found negatively correlated to AHI. No other p-values reached significance. P-value significance was set at 0.05.

Supplementary figure 2. Sample estimation
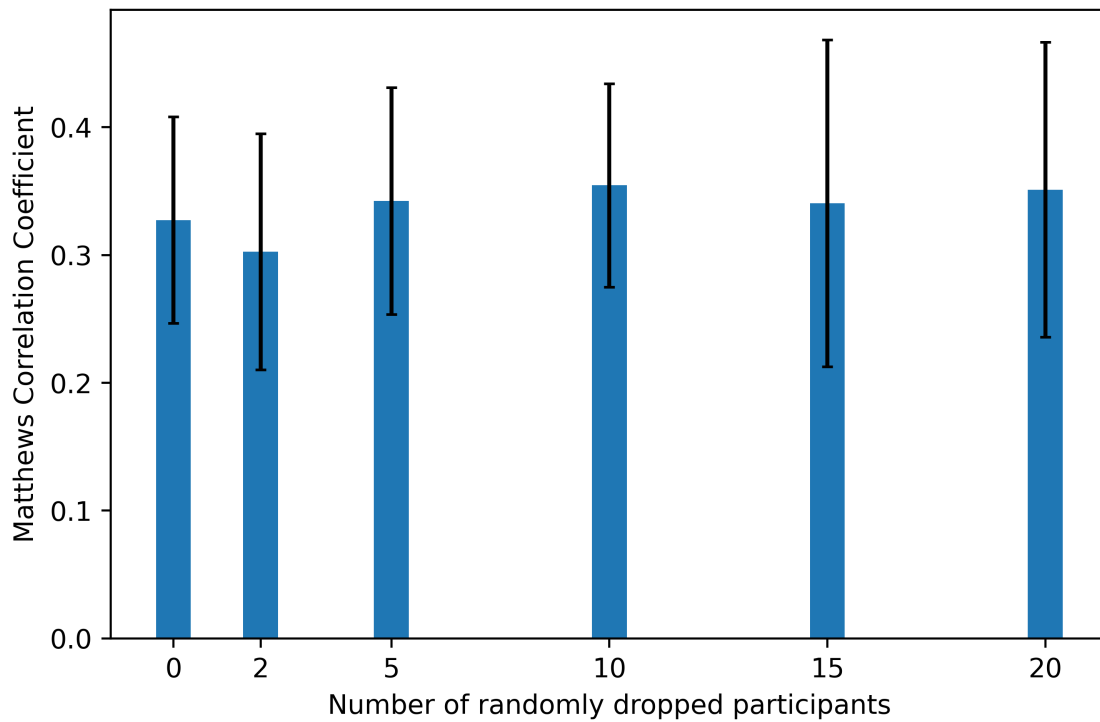
Supplementary Figure 2 shows how the Matthews Correlation Coefficient (MCC) varies when a progressively larger number of samples is dropped from the training dataset. We progressively eliminated 0, 2, 5, 10, 15 and then 20 random samples from the dataset. This procedure was repeated 30 times The mean MCC was then calculated. Given that the performance is stable (i.e., a plateau was reached), we assume that a dataset comprised of 78 participants is large enough to be used for training our algorithms. This procedure was carried out on the algorithm applied to the AHI=5 threshold classification.