

SUPPLEMENTARY INFORMATION

TITLE: The stability of the ADO score among UK COPD patients from The Health Improvement Network

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Appendix S1- Rules used to convert raw FEV1 into FEV1% predicted

FEV1% predicted: For certain observations, it was necessary to convert raw FEV1 values to FEV1% predicted. FEV1 units were extracted from THIN and showed that raw FEV1 may be in liters, % predicted, or with a missing unit. The FEV1 unit variable had substantially more missingness than the raw FEV1 and was thus found to be unreliable. We used four assumptions to translate raw FEV1 into % predicted.

1. If raw FEV1 was greater than or equal to 0.1 and less than 0.3 then these values were multiplied by 100 to obtain FEV1% predicted.
2. If the FEV1 raw value was greater than or equal to 10 and less than or equal to 160 then it was assumed that this was already FEV1% predicted.
3. If raw FEV1 was less than 10 and greater than or equal to 0.3, this represented a liter value. In these instances, we had to calculate expected FEV1 values for each patient for each year using that patient's age, height, and gender. The equation (called HSE) to calculate expected FEV1 values was developed specifically for the English population (1) and gives very similar results to the GLI equations (2), the latter of which seemed more suitable for more diverse populations and for international cohorts. The HSE equation is given below.

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$$expectedFEV1 = e^{(intercept+b1[age]+b2[age^2]+b3(\ln[height]))}$$

4. If after 1 through 3, the converted FEV1% predicted remained greater than 160 or less than 10, then we assumed that these were errors and we converted these measurements to missing observations.

Table S1- *Assignment of points for the updated ADO score*

Points	0	1	2	3	4	5	7
Age (in years)	40 - 49		50 - 59		60 - 69	70 - 79	≥80
Dyspnoea (mMRC)	0	1 - 2	3	4			
FEV1% predicted	≥81	65 - 80	51 - 64	36 - 50	≤35		

Table S2- Assignment of points for the updated ADO score**Baseline characteristics of patients included and excluded in the ADO change analysis based upon sufficient number of ADO measurements (≥ 3)**

Characteristics	≥ 3 ADO Measurements (N= 4,804)	< 3 ADO Measurements (N= 60,720)	Total (N= 65,524)
Age – Mean(SD)	68.9 (9.3)	72.6 (11.3)	72.3 (11.2)
Dyspnoea (mMRC Score) – N(%)			
0	859 (17.9)	5,686 (16.2)	6,545 (16.4)
1	1,883 (39.2)	12,827 (36.5)	14,710 (36.8)
2	1,323 (27.5)	9,285 (26.4)	10,608 (26.6)
3	666 (13.9)	5,873 (16.7)	6,539 (16.4)
4	73 (1.5)	1,453 (4.1)	1,526 (3.8)
missing	0	25596	25596
FEV1% predicted – Mean(SD)	59.3 (19.7)	59.8 (21.7)	59.7 (21.5)
First ADO score – Mean(SD)	7.4 (2.1)	7.6 (2.3)	7.6 (2.3)
No. of Females – N(%)	2,151 (44.8)	28,361 (46.7)	30,512 (46.6)
Country – N(%)			
England	3,577 (74.5)	44,984 (74.1)	48,561 (74.1)
Northern Ireland	275 (5.7)	2,940 (4.8)	3,215 (4.9)
Scotland	382 (8.0)	5,514 (9.1)	5,896 (9.0)
Wales	570 (11.9)	7,282 (12.0)	7,852 (12.0)
Townsend deprivation quintile - N(%)			
1 – least deprived	815 (17.3)	9,955 (16.7)	10,770 (16.8)
2	880 (18.7)	10,727 (18.0)	11,607 (18.1)
3	1,032 (21.9)	12,648 (21.2)	13,680 (21.3)
4	1,058 (22.5)	14,174 (23.8)	15,232 (23.7)
5 – most deprived	924 (19.6)	12,101 (20.3)	13,025 (20.3)
missing	95	1115	1210
Cigarette smoking – N(%)			
Current	1,301 (28.7)	17,479 (32.3)	18,780 (32.1)
Former	2,638 (58.3)	29,116 (53.9)	31,754 (54.2)
Never	588 (13.0)	7,449 (13.8)	8,037 (13.7)
missing	277	6676	6953
BMI category – N(%)			
Underweight (<18.5 kg/m ²)	124 (2.7)	3,396 (6.5)	3,520 (6.2)
Normal (18.5 - < 25 kg/m ²)	1,480 (32.6)	19,604 (37.4)	21,084 (37.0)
Overweight (25 - < 30 kg/m ²)	1,675 (36.9)	16,669 (31.8)	18,344 (32.2)
Obese (≥ 30 kg/m ²)	1,263 (27.8)	12,813 (24.4)	14,076 (24.7)
missing	262	8238	8500
LAMA prescription – N(%)	1,332 (27.7)	12,519 (20.6)	13,851 (21.1)
LABA prescription – N(%)	1,477 (30.8)	12,097 (19.9)	13,574 (20.7)
SAMA prescription – N(%)	777 (16.2)	5,521 (9.1)	6,298 (9.6)
SABA prescription – N(%)	2,848 (59.3)	26,231 (43.2)	29,079 (44.4)
ICS containing prescription – N(%)	1,645 (34.2)	13,472 (22.2)	15,117 (23.1)
PR referral - N(%)	211 (4.4)	1,416 (2.3)	1,627 (2.5)
Heart Failure – N(%)	245 (5.1)	5,985 (9.9)	6,230 (9.5)
Ischemic Heart Disease – N(%)	934 (19.4)	13,753 (22.7)	14,687 (22.4)
Anxiety – N(%)	109 (2.3)	1,378 (2.3)	1,487 (2.3)
Depression – N(%)	305 (6.4)	3,080 (5.1)	3,385 (5.2)
Diabetes – N(%)	593 (12.3)	8,135 (13.4)	8,728 (13.3)
TIA, stroke, PAD – N(%)	589 (12.3)	10,264 (16.9)	10,853 (16.6)
Asthma – N(%)	1,730 (36.0)	19,362 (31.9)	21,092 (32.2)

For patients without a single calculable ADO score, a random pseudo study entry date was assigned based on the distribution of the study entry dates among included patients. Age, mMRC score, and FEV1% predicted were used to

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calculate the first ADO score in the table. Abbreviations: BMI= body-mass index, LAMA= long-acting muscarinic antagonist, LABA= long-acting beta2 Agonists, mMRC= modified Medical Research Council, FEV= forced expiratory volume, ICS= inhaled corticosteroids, PR= Pulmonary Rehabilitation, TIA= transient Ischemic attack, PAD= Peripheral artery disease

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