

Supplements

Characterisation of pulmonary function trajectories: results from a Brazilian cohort

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Methods

Height and weight measurements

At four years old children were weighed using mechanical scales of Salter CMS with a precision of 100 grams. Height was measured using portable infantometers (precision of 1 mm). At the ages of 11 and 15 years old, weight was measured using an electronic scale (SECA, Australia) with a precision of 100 grams, while a stadiometer with a precision of 1 mm was used for height. At 18 and 22 years of age, the weight of the individuals was measured by a scale attached to the Bod Pod equipment and height was measured in the same way as in the 15 years visit.

Selection Model

Using repeatedly collected information, Group Based Trajectory Modelling (GBTM) can identify distinct subgroups of individuals whose measurements followed a similar pattern over time (1). After testing different numbers of groups (3, 4 and 5 groups) with different polynomial functions (1 = linear; 2 = quadratic; 3 = cubic), we selected the best model according to the Bayesian Information Criteria (BIC) and the Akaike Information Criteria (AIC) (2).

The model adequacy was additionally assessed by other fitting parameters recommended by Nagin (3): (a) an average posterior probability value (APP) – if there is no ambiguity in individuals assignment, the APP should be 1 for each group. An APP above 0.70 for all groups is generally recommended; (b) the odds of correct classification (OCC) for a trajectory group: calculated with proportions based on the maximum posterior probability. An OCC above 5.0 for all groups shows good assignment accuracy; and (c) correspondence between estimated and expected group probabilities – the mismatch between both must be zero for a perfectly fitting model.

Tables

Table S1. Model fit parameters according to pulmonary function trajectories for each parameter

	APP	OCC	Estimated Probability	Expected Probability
VEF₁				
1 (Low)	0.90	50.58	0.155	0.163
2 (Average)	0.92	7.45	0.596	0.601
3 (High)	0.90	28.37	0.249	0.251
FVC				
1 (Low)	0.91	34.68	0.224	0.222
2 (Average)	0.91	8.44	0.588	0.563
3 (High)	0.91	38.07	0.219	0.214
VEF₁/FVC				
1 (Low)	0.91	106.51	0.085	0.091
2 (Average)	0.90	10.48	0.443	0.442
3 (High)	0.89	9.88	0.472	0.471

APP: Average Posterior Probability; OCC: Odds of Correct Classification

Table S2. Characteristics of non-respondents (n = 2332) and individuals with pulmonary function data (n = 2917): the 1993 Pelotas Birth Cohort. Brazil.

	Sample without outcome data		Sample with outcome data		Two-sample test of proportions
	No. /total	Percent	No. /total	Percent	P value
Male sex	1168/2331	50.1%	1435/2917	49.2%	0.259
Lower maternal education (years)*	724/2329	31.1%	744/2913	25.5%	< 0.001
Lower income (quintiles)↓	496/2270	21.8%	535/2867	18.7%	0.003
Low birth weight (<2500 grams)	244/2317	10.5%	266/2917	9.2%	0.956
Preterm Delivery (<37 week)	206/2065	12.6%	276/2607	10.6%	0.984
Maternal smoking during pregnancy	836/2332	32.8%	916/3511	34.4%	0.897

*Correspondent to 4 or fewer years of education completed.

↓ Correspondent to the first quintile.

References

1. Nagin DS, Tremblay RE. Developmental trajectory groups: Fact or a useful statistical fiction? *Criminol.* 2005;43(4):873-904.
2. Jones BL, Nagin DS, Roeder K. A SAS procedure based on mixture models for estimating developmental trajectories. *Sociol Methos Res.* 2001;29(3):374-93.
3. Nagin DS, Odgers CL. Group-based trajectory modeling in clinical research. *Ann Rev Clin Psychol.* 2010;6:109-38.