

Global LUNGS INITIATIVE

ERS Task Force (TF-2009-03) to establish improved Lung Function Reference Values

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Newsletter Global Lungs Initiative

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FORTHCOMING PREDICTED VALUES

a. *Subdivision in groups*

Initially the 70 datasets from 34 countries were subdivided according to ethnic group or area of residence as follows:

A Whites	Europe, Australia, USA, Canada
B African Americans	USA
C Mexican Americans	USA
D Latin Americans	Brazil, Chile, Mexico, Uruguay, Venezuela
E Orientals	mainland China, Korea, Thailand, Taiwan
F Northern Africa & Iran	Algeria, Tunisia, Iran
G Indian subcontinent	India, Pakistan
H Omani	

b. *Combining groups*

Over the past 6 months we have invested considerable time discussing the physiological, methodological and practical merits of combining groups and deciding whether there were sufficient data to derive predicted values. There are obvious advantages to combining groups with very similar predicted values, but this practical advantage must be justified physiologically and statistically. For example, it has recently been shown that predicted values for Mexican Americans and white USA citizens are the same (Kiefer *et al.* *Am J Epidemiol* 173;(4):376-387), but can this simplification apply to all Hispanics? We set the criteria for combining groups as: (a) minimal effects on predicted mean values and, most importantly: (b) small effects on the clinically important lower limit of normal. The latter was checked by inspection of the percentage of subjects in groups A-H whose observations fell below the fifth centile. We were able to corroborate the findings of Kiefer *et al.*, and findings led us to conclude that there is currently only need for three groups:

A Caucasians	Europe, Australia, USA, Canada, Mexican Americans, Brazil, Chile, Mexico, Uruguay, Venezuela, Algeria, Tunisia, Iran
B Blacks	African Americans
C Orientals	mainland China, Thailand, Taiwan

This considerable simplification will facilitate implementation even in smaller PFT devices.

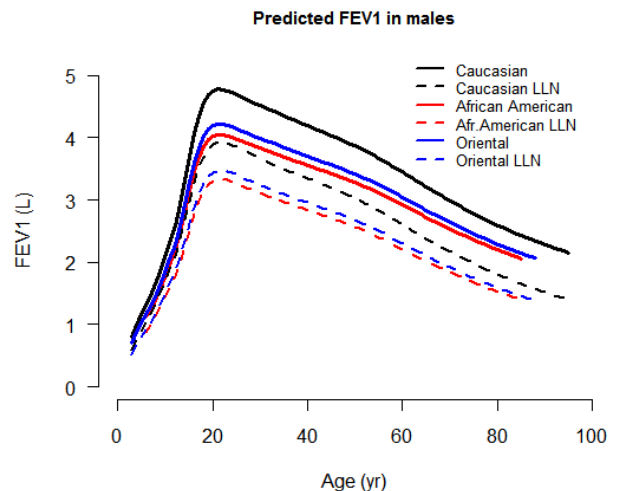
Unfortunately, data received to date from the Indian subcontinent were too disparate, with unusually large coefficients of variation particularly in children. More data are required before predicted values can be recommended. Predicted values for Omani people differ only minutely from those for oriental individuals. No data are available from sub-Saharan Africa and most large Asian countries.

c. Proportional differences between groups

Until recently, modelling entailed an interaction term for group and age. However, little is lost if the interaction is dropped. This greatly simplifies the forthcoming equations, which will be of the form:

$$\text{Predicted} = \exp(a + b \cdot \log(\text{height}) + c \cdot \log(\text{age}) + d + e \cdot \text{group})$$

where d = cubic spline for age, and either 0 or 1 is substituted for the relevant group. An example of differences between groups is shown on the right.



IMPLEMENTATION IN SOFTWARE

Many people have complained that they have not been able to apply the “all-age” equations

(Stanojevic *et al.* Spirometry centile charts for young Caucasian children. The Asthma UK Collaborative Initiative *Am J Respir Crit Care Med* 2009; 180; 547–552), as they had not been implemented by manufacturers. We would like to point out that an Excel spreadsheet with plug-in can be downloaded from <http://lungfunction.org/growinglungs/software.html>. A desktop program can also be downloaded for free from the same web address. To the best of our knowledge MedGraphics and ndd have recently implemented the “all-age” equations in their software and will provide updates for free. See <http://lungfunction.org/growinglungs/software.html> for details, or contact your supplier.

We are currently contacting all other PFT manufacturers to ascertain whether and to what extent (*i.e.* any limitations as to which software versions/devices) the equations will actually be available in.

It is expected that the new Global Lungs equations will become available in 2011, *i.e.* after a manuscript has been accepted by the ERS, and been accepted for publication.

QUALITY CONTROL: PHASE 2 ANALYSES

J. Hankinson has conceived a website with extensively illustrated tutorials about quality control of flow-volume and volume-time curves, with special attention to recordings where reviewers might give disparate quality ratings. In addition he has prepared software for quality assessment of large files. X. Baur, M. Velasco Garrido and A. Langhammer are collaborating to score a sub-sample of flow-volume curves collected from a large population based study.

The phase 2 analysis of paediatric data (G. Hall, M. Gappa, S. Davis, J. Kirkby and S. Stanojevic) is well under way. The team will first independently score >300 paediatric curves to determine which parameters best characterize good quality curves in children, and use these to develop A-F scoring similar to those used in adults. Subsequently they will apply these criteria using the program developed by J. Hankinson and test the generalizability on a larger scale.

ATS MEETING 2011

The next ‘open’ meeting to discuss interim results will be at the ATS in Denver on Monday May 16th 12.00 - 13.30 at the Sheraton Hotel, Plaza Building Directors Row E which is approximately 5 minutes walk from the conference centre. All registered members, including manufacturers are welcome. Please let us know if you are able to attend this meeting..

ERS AMSTERDAM MEETING 2011

A general open meeting for all interested parties, including manufacturers, is planned for the ERS meeting in September, when progress will be reported. Further announcements will be made in due time.

FUTURE POLICY OF DATA SHARING

Data collection is a time consuming and costly process, and data sharing allows important information to be revealed that can usually only be obtained large datasets. Over the last decade data sharing has become common, particularly in the field of genetics. Many funding agencies, aware of the rewards from data sharing, now make this a prerequisite for financial support. It is proposed to design a structure which allows the management of good quality pulmonary function data, shared for scientific purposes, under the aegis of an international organization. Members of the Global Lungs network who are familiar with the type of challenges likely to be faced when sharing data, e.g. 1) willingness to share, 2) locating shared data, and 3) using shared data (rules and regulations, ethics, privacy, acknowledgement, etc.) are kindly requested to contact us at analyticalteam@lungfunction.org. Our next steps are to develop a Global Lungs Initiative data sharing policy, identify a location for the data repository and establish a protocol for sharing and using these data.

PREDICTED VALUES ON LUNG VOLUMES AND $T_{L,CO}$

There are many requests to derive predicted values for lung volumes, and for $T_{L,CO}$ ($D_{L,CO}$) including V_A . Paul Enright has agreed to take the lead in this endeavour. A number of members already share data on these indices with the Global Lungs Initiative, but more are required before robust regression equations can be published. Members are kindly requested to contact us at analyticalteam@lungfunction.org and lungguy@gmail.com if they wish to share data for this initiative, or suggest persons or institutes which should be contacted to this end.

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