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LETTER TO THE EDITOR

Paradoxes of spirometry results, and smoking cessation

*Gary Parkes[a],
Trish Greenhalgh[b]

[a] GP/Researcher, The Limes Surgery, Hoddesdon, UK
[b] Barts and the London School of Medicine and Dentistry, London, UK

*Correspondence:
Dr Gary Parkes,
GP/Researcher,
The Limes Surgery,
Hoddesdon,
Hertfordshire,
EN11 8EP, UK
E-mail: parkesko@hotmail.co.uk

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Dear Sir,

We note the comments made by Quanjer and Enright in their editorial – originally published online (*PCRJ* Articles in Press section, www.thepcrj.org) and now published in this issue[1] – relating to our original publication on the effect on smoking quit rates of telling patients their lung age.[2] Dr Quanjer actually made similar comments in the *BMJ* rapid responses section when the original paper was published in 2008. Even though we respect their views as long-standing researchers and advocates on the subject of standardisation of lung measurement, we have several observations to make.

We are viewing the current situation from different perspectives. We all want smokers to stop smoking. We all want accuracy, consistency and real information. Quanjer and Enright's emphasis is on clinicians, technical aspects, and diagnostic accuracy. Our research emphasis was on communicating understandable information to inform smokers and to promote behaviour change.[2]

Firstly, Quanjer and Enright have highlighted the paradoxes that occur when considering spirometry measurements as lung age. For example; "How can lungs get 10 years younger just by using salbutamol?" Of course they cannot and they do not. Lung age is estimated on the basis of 'the best FEV_1 achievable post-bronchodilation', in the same way that the diagnosis of COPD is made on the basis of post-bonchodilator spirometry. Likewise, in the assessment of COPD, one does not say that pre-salbutamol the patient has moderate COPD and post-salbutamol they have mild COPD.

Secondly, they have used different prediction tables, and assert that with Morris, ECCS/ERS, Crapo, and Newbury, the lung age for a man with height 178cm and an FEV_1 of 3.2 litres varies from 62 to 89 years. They do not state how these calculations were carried out. Was it by assuming that 100% of predicted FEV_1 (in the different tables) equates to the normal chronological age for that person or by some other mechanism?

Using the same logic, we would like to turn this conundrum upside down using another example. With reference to a 50-year old, 183cm tall, Caucasian male; according to ECCS his FEV_1 result is regarded as normal (100% predicted) if his FEV_1 is 3.86 litres, but the same subject tested with ATS guidelines using NHANE 3 reference tables would have a 100% predicted value if his FEV_1 was 3.19 litres. This >600ml difference is just as unacceptable as the anomaly about lung age that Quanjer and Enright have illustrated. So what FEV_1 is normal for that man?

Until July this year (when NICE published revised guidance on the diagnosis and management of COPD[3]), this problem was further complicated in the UK by NICE using BTS guidelines for COPD because a diagnosis would only be made if the FEV_1 was <80% of predicted (combined with an FEV_1/FVC ratio of <0.7) whereas according to ERS and ATS guidelines the thresholds for diagnosing mild COPD rely only on the FEV_1/FVC ratio with severity alone determined by FEV_1 prediction tables.

As *PCRJ* readers no doubt appreciate, the examples given in Quanjer and Enright's editorial[1] highlight the current nonsensical situation of having different prediction tables. This is not the fault of the concept of lung age, which is simply a way of communicating results. The fact that a patient could have an FEV_1 which is normal in one table and abnormal in another shows that use of the tables is flawed. As is eloquently outlined in their editorial[1] (and argued in the literature in the past) this highlights the need for standardisation and use of tables relevant to the population being tested. With the emergence of more widespread use of spirometry, we can envisage a time when all smokers have a regular check on their lungs and will plot their own deterioration from their personal best, rather than rely on population averages. It would be far more logical to use each individual person as their

own control rather than using some arbitrary set of normal values from a different population. The sooner that smokers have easy and regular access to spirometry the better. If the deterioration in their spirometry readings can be communicated in ways that promote behaviour change then all physicians should be satisfied.

As they say in the proverb, "Don't throw out the baby with the bath water". Until we have something better, lung age should not be thrown out. Patients can understand lung age much better than percent predicted.[4] Let us get the tables sorted out first, with more accuracy for populations and more helpful results for individuals.

Conflict of interest declaration

Authors of the RCT on using lung age for promoting smoking cessation.

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