

The number needed to treat provides additional insight on the performance of detection points of asthma exacerbations in self-management plans

With interest we have read the paper of Kupczyk *et al.*¹ It is an important contribution to the current understanding of the course and early detection of asthma exacerbations, especially with the advent of internet-based self-management programmes using daily or weekly monitoring.² In the current research the authors found that the combination of a 20% decrease in peak expiratory flow (PEF) on 2 consecutive days or a 20% increase in day symptoms on 2 consecutive days optimally detects an exacerbation with 65% sensitivity and 94.9% specificity.

However, the authors have not addressed an important aspect of the performance of detection points, namely how often it will lead to a false positive prediction for one

true positive prediction. This measure of applicability can be captured by the number needed to treat (NNT). In a recent study on early detection of asthma exacerbations we showed that using 70% of personal best PEF resulted in a NNT of minimally 10, which means that for each predicted exacerbation, 10 false positive signals were given.³ When using an increase in symptoms of two SDs above the mean symptom score during baseline, the NNT was 17.³ Based on only sensitivity and specificity the authors conclude their optimal detection point is the combination of PEF and symptoms in an 'OR' fashion. However, this worsens the NNT of PEF or symptoms solely, indicating a higher number of false positive predictions of exacerbations per correctly identified exacerbation. In contrast, our study showed that combining information on PEF (70%PB) 'AND' symptoms (>2 SD) yielded the best performance with sensitivity 85.1%, specificity 97.2% and relatively low NNT of 6.³

Another important issue is when an exacerbation is detected. In the current study the authors use values for PEF and symptoms after the first visit to the clinic. Ideally, in a self-management plan, a detection point would identify a future exacerbation before it actually occurs, rather than classify it as such afterwards. Therefore it would have been interesting to know which combination would be optimal using the symptoms and PEF of the assessed values at -2, -5 and -7 days before the exacerbation. In our study the optimal detection point detected future exacerbations 4.1 days before occurrence.³

The applicability of detection points in practice can be best assessed by including the NNT and the number of days before the start of the exacerbation as measures of performance.

Persijn J Honkoop, Jacob K Sont

Department of Medical Decision Making, Leiden University Medical Center, Leiden, Zuid Holland, The Netherlands

Correspondence to P J Honkoop, Department of Medical Decision Making, Leiden University Medical Center, Postzone J-10-s, room J-10-87, Albinusdreef 2, PO Box 9600, Leiden, Zuid Holland 2300 RC, The Netherlands; p.j.honkoop@lumc.nl

Contributor PH wrote the correspondence. JS provided comments.

Competing interests None.

Provenance and peer review Not commissioned; internally peer reviewed.

To cite Honkoop PJ, Sont JK. *Thorax* 2013;**68**:1069–1070.

Received 8 May 2013

Accepted 31 May 2013

Published Online First 2 July 2013



► <http://dx.doi.org/10.1136/thoraxjnl-2013-203952>

Thorax 2013;**68**:1069–1070.
doi:10.1136/thoraxjnl-2013-203853

REFERENCES

- 1 Kupczyk M, Haque S, Sterk PJ, *et al*. Detection of exacerbations in asthma base don electronic diary data: results from the 1-year prospective BIOAIR study. *Thorax* 2013;68:1070–1.
- 2 Van der Meer V, Bakker MJ, Sont JK, *et al*. Internet-based self-management plus education compared with usual care in asthma: a randomized trial. *Ann Intern Med* 2009;151:110–20.
- 3 Honkoop PJ, Taylor DR, Smith AD, *et al*. Early detection of asthma exacerbations by using action points in self-management plans. *ERJ* 2013;41: 53–9.