

9. **Pai M**, Zwerling A, Menzies D. Systematic review: T-cell-based assays for the diagnosis of latent tuberculosis infection: an update. *Ann Intern Med* 2008;**149**:177–84.
10. **Zwinderman AH**, Bossuyt PM. We should not pool diagnostic likelihood ratios in systematic reviews. *Stat Med* 2008;**27**:687–97.
11. **Rutter CM**, Gatsonis CA. A hierarchical regression approach to meta-analysis of diagnostic test accuracy evaluations. *Stat Med* 2001;**20**:2865–84.
12. **Reitsma JB**, Glas AS, Rutjes AWS, *et al*. Bivariate analysis of sensitivity and specificity produces informative summary measures in diagnostic reviews. *J Clin Epidemiol* 2005;**58**:982–90.
13. **Rutter CM**, Gatsonis CA. Regression methods for meta-analysis of diagnostic test data. *Acad Radiol* 1995;**2**(Suppl 1):S48–56 [discussion S65–7, S70–1 pas].
14. **Lijmer JG**, Bossuyt PMM, Heisterkamp SH. Exploring sources of heterogeneity in systematic reviews of diagnostic tests. *Stat Med* 2002;**21**:1525–37.
15. **Moses LE**, Shapiro D, Littenberg B. Combining independent studies of a diagnostic test into a summary ROC curve: data-analytic approaches and some additional considerations. *Stat Med* 1993;**12**:1293–316.
16. **Irwig L**, Macaskill P, Glasziou P, *et al*. Meta-analytic methods for diagnostic test accuracy. *J Clin Epidemiol* 1995;**48**:119–30 [discussion 131–2].
17. **Deeks JJ**. Systematic reviews in health care: systematic reviews of evaluations of diagnostic and screening tests. *BMJ* 2001;**323**:157–62.
18. **Morrison J**, Pai M, Hopewell PC. Tuberculosis and latent tuberculosis infection in close contacts of people with pulmonary tuberculosis in low-income and middle-income countries: a systematic review and meta-analysis. *Lancet Infect Dis* 2008;**8**:359–68.
19. **Shaw JB**, Wynn-Williams N. Infectivity of pulmonary tuberculosis in relation to sputum status. *Am Rev Tuberc* 1954;**69**:724–32.
20. **van Geuns HA**, Meijer J, Styblo K. Results of contact examination in Rotterdam, 1967–1969. *Bull Int Union Tuberc* 1975;**50**:107–21.
21. **Grzybowski S**, Barnett GD, Styblo K. Contacts of cases of active pulmonary tuberculosis. *Bull Int Union Tuberc* 1975;**50**:90–106.
22. **Sterne JA**, Gavaghan D, Egger M. Publication and related bias in meta-analysis: power of statistical tests and prevalence in the literature. *J Clin Epidemiol* 2000;**53**:1119–29.
23. **Zamora J**, Abraira V, Muriel A, *et al*. Meta-DiSc: a software for meta-analysis of test accuracy data. *BMC Med Res Method* 2006;**6**:31.
24. **Kobashi Y**, Sugiu T, Shimizu H, *et al*. Clinical evaluation of the T-SPOT.TB test for patients with indeterminate results on the QuantiFERON TB-2G test. *Intern Med* 2009;**48**:137–42.
25. **Mandalakas AM**, Hesselting AC, Chegou NN, *et al*. High level of discordant IGRA results in HIV-infected adults and children. *Int J Tuberc Lung Dis* 2008;**12**:417–23.
26. **Raby E**, Moyo M, Devendra A, *et al*. The effects of HIV on the sensitivity of a whole blood IFN-gamma release assay in Zambian adults with active tuberculosis. *PLoS ONE* 2008;**3**:e2489.
27. **Talati NJ**, Seybold U, Humphrey B, *et al*. Poor concordance between interferon-gamma release assays and tuberculin skin tests in diagnosis of latent tuberculosis infection among HIV-infected individuals. *BMC Infect Dis* 2009;**9**:15.
28. **Syed Ahamed Kabeer B**, Sikhmani R, Swaminathan S, *et al*. Role of interferon gamma release assay in active TB diagnosis among HIV infected individuals. *PLoS One* 2009;**4**:e5718.
29. **Lee JY**, Choi HJ, Park I, *et al*. Comparison of two commercial interferon-gamma assays for diagnosing Mycobacterium tuberculosis infection. *Eur Respir J* 2006;**28**:24–30.

## Lung alert

### Updating prognostic parameters in COPD: the updated BODE index and ADO

The BODE index was devised to better reflect the multisystem effects of chronic obstructive pulmonary disease (COPD), allowing for better prognostic estimation than that provided by forced expiratory volume in 1 s (FEV<sub>1</sub>) alone. The grading system, based on four parameters—that is, body mass index, airflow obstruction, Medical Research Council (MRC) dyspnoea score and the 6 min walk distance—was verified by population studies.

This study set out to assess whether the BODE index could match the observed mortality in different populations of patients with COPD. The authors assessed the calibration of the BODE index, updated it to reflect any changes in calibration and subsequently developed a simplified index for use in Primary Care.

Two populations of patients with COPD were observed for their 3-year mortality as opposed to those predicted by the BODE index. The populations included patients in the Swiss Barmelweid and the Spanish Phenotype and Course COPD cohorts. In both cohorts they compared the observed 3-year risk of all-cause mortality with the risk predicted by the BODE index.

The authors found a poor calibration of the BODE index, with relative underprediction of the 3-year risk of mortality in the Swiss cohort (3-year predicted mortality risk of 21.7% vs 34.1% observed mortality), and an overprediction of the mortality risk in the Spanish cohort (predicted 16.7% vs 12% observed mortality). They concluded that the BODE index does not reflect all-cause mortality in the different populations. Subsequently they performed further regression analysis and updated the index with a greater emphasis on the 6 min walk distance. They also devised a new predictor of all-cause mortality by the ADO index, using age, airflow obstruction and MRC dyspnoea score.

The authors conclude that the updated BODE and ADO indices provide better prognostic assessment of patients with COPD as measured in the named populations. They hope that the identification of baseline risks through prognostic studies may aid in guideline development, and be followed by targeted therapies to alter the risks.

- Puhan MA, Garcia-Aymerich J, Frey M, *et al*. Expansion of the prognostic assessment of patients with chronic obstructive pulmonary disease: the updated BODE index and the ADO index. *Lancet* 2009;**374**:704–11.

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*Thorax* 2010;**65**:276. doi:10.1136/thx.2009.132894