|  |
| --- |
| **Comparison of lung cancer prediction scores for pulmonary nodules identified on baseline CT scan in a lung cancer screening cohort** |
| Paul Dawkins1,2, Henry Marshall3,4, Linda Passmore3,4, Barbara Page3,4, Kwun Fong3,4 |
| 1. *Department of Respiratory Medicine, Middlemore Hospital, Auckland, New Zealand* 2. *University of Auckland, Auckland* 3. *Department of Thoracic Medicine, The Prince Charles Hospital,* *Brisbane, QLD, Australia* 4. *University of Queensland Thoracic Research Centre, Brisbane, Brisbane, QLD, Australia* |
| **Introduction:** This study assessed the performance of seven published lung cancer prediction scores for nodules identified at baseline in the Queensland cohort of the International Lung Screening Trial (ILST).  **Methods:** Equations were independently derived from the literature by 2 researchers for seven models in Microsoft Excel and R (Mayo, Veterans Affairs (VA), Brock, Peking University People’s Hospital (PKUPH), UK Lung Screen (UKLS), Zhang and Gurney). Discrimination and Calibration of each model was assessed using area under the Receiver Operator Characteristics curves (AUC) and validation plots respectively. Net benefit was assessed with decision curve analysis (DCA), for using the prediction score to guide biopsy versus a “biopsy all” approach.  **Results:** 318 nodules were identified in 203 individuals out of 595 who had baseline scans. Follow up was for median 56 months from baseline scan (range 43 - 74 months). 17 nodules in fifteen patients subsequently developed lung cancer at the time of censoring. The Brock score had the largest AUC (0.884, 95% CI 0.791-0.977) for the 318 nodules although the confidence intervals overlapped with other models. Validation Plots showed Brock was the best calibrated (intercept 0.21, 95% CI -0.36-0.78; slope 1.07, 95% CI 0.70-1.44). Net benefit was best for Brock in the 6-15% predicted risk probability range. Brock and Zhang continued to perform well in the 15-30% predicted risk probability range. UKLS showed good net benefit in the 6-10% range, but this decreased steeply with higher probabilities. Mayo showed relatively small net benefit across the range. PKUPH, VA and Gurney overestimated cancer risk and showed no net benefit.  **Conclusion:** We explored cancer prediction models for baseline nodules identified in a lung cancer screening cohort. Brock score performed best for discrimination, calibration, and DCA for lung biopsy. Further validation could be achieved by applying these prediction models to other screening cohorts or radiological databases. **Grant Support:** NHMRC. |