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Scan-based competing death risk model for re-evaluating lung cancer computed tomography screening eligibility

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Shareable abstract (@ERSpublications)
Lung cancer CT screening participants with a relatively low risk of lung cancer incidence and a high risk of competing death can be identified by applying two respective post-scan risk models, and in turn may benefit from other personalised trajectories https://bit.ly/2ZDe62K

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Abstract

Background A baseline computed tomography (CT) scan for lung cancer (LC) screening may reveal information indicating that certain LC screening participants can be screened less, and instead require dedicated early cardiac and respiratory clinical input. We aimed to develop and validate competing death (CD) risk models using CT information to identify participants with a low LC risk and a high CD risk.

Methods Participant demographics and quantitative CT measures of LC, cardiovascular disease and chronic obstructive pulmonary disease were considered for deriving a logistic regression model for predicting 5-year CD risk using a sample from the National Lung Screening Trial (n=15 000). Multicentric Italian Lung Detection data were used to perform external validation (n=2287).

Results Our final CD model outperformed an external pre-scan model (CD Risk Assessment Tool) in both the derivation (area under the curve (AUC) 0.744 (95% CI 0.727–0.761) and 0.677 (95% CI 0.658–0.695), respectively) and validation cohorts (AUC 0.744 (95% CI 0.652–0.835) and 0.725 (95% CI 0.633–0.816), respectively). By also taking LC incidence risk into consideration, we suggested a risk threshold where a subgroup (6258/23 096 (27%)) was identified with a number needed to screen to detect one LC of 216 (*versus* 23 in the remainder of the cohort) and ratio of 5.41 CDs per LC case (*versus* 0.88). The respective values in the validation cohort subgroup (774/2287 (34%)) were 129 (*versus* 29) and 1.67 (*versus* 0.43).

Conclusions Evaluating both LC and CD risks post-scan may improve the efficiency of LC screening and facilitate the initiation of multidisciplinary trajectories among certain participants.