

TO SCREEN OR NOT TO SCREEN? INCREMENTAL COST-EFFECTIVENESS RATIO FOR LUNG CANCER SCREENING AMONG SMOKERS.

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Background: Given the potential of early lung cancer detection to improve survival, accurate assessment of the cost-effectiveness of low-dose computed tomography (LDCT) screening is crucial. We report the results of a cost-effectiveness analysis of screening for Italian persons at high risk of lung cancer from the public payer's perspective

Method: The study built on a mathematical decision model to estimate the cost-effectiveness of annual LDCT screening for 5 years in a high-risk population of smokers (at least 30 pack-years) aged 55-79 years. The stage distribution of patients diagnosed as part of the COSMOS screening study was used for the "screening arm;" the stage distribution of patients in the SEER database was used for the "usual care arm." Treatment costs were determined using detailed individual-level administrative information from our Institutional database of lung cancer patients. Lung cancer survival in screened patients was adjusted for 2 year-lead time bias. The model estimated expected future life years using survival probabilities according to age, sex, and lung cancer stage (or no lung cancer). Quality-Adjusted Life Years (QALYs) gained and Life Years (LY) gained were estimated.

Results: The base-case incremental cost for each QALY gained was 4747,57 Euro. The incremental cost-effectiveness ratio (ICER) for each LY gained was 4069 Euro. An extensive sensitivity analysis showed that model outcomes were particularly sensitive to lung cancer prevalence, the sensitivity and specificity of screening, and the lead-time bias assumed.

Conclusions: Our analysis indicates that LDCT screening is associated with a low ICER of 4069 Euro, meaning that this is the yearly incremental cost of saving the life of a patient, and is lower than the ICER accepted by the Italian government. The implication is that implementation of screening throughout Italy can be achieved at a relatively low cost, a finding which should be taken into account by health policy decision-maker.