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## Benefits and harms of low-dose CT screening in China: A decision analysis

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**Purpose:** This study aimed to evaluate population outcomes with Low-Dose CT (LDCT) screening for lung cancer in urban areas of China.

**Methods:** A decision tree model with three scenarios (low-dose CT screening, chest X-ray screening and no screening) was developed to compare screening results in a simulated Chinese urban cohort (100,000 smokers aged 45-80 years). Data of participant characteristics were obtained from national registries and epidemiological surveys for estimating lung cancer prevalence. The selection of other tree variables such as sensitivities and specificities of LDCT and chest X-ray screening were based on literature research (mainly in China). Base case and sensitivity analyses were performed to compare mortality, false positive findings and quality-adjusted life years (QALY) in the three scenarios.

**Results:** In base case analysis, there were 448, 541, and 591 lung cancer deaths in the low-dose CT, chest X-ray and no screening scenarios, respectively (17.2% reduction in low-dose CT screening over chest X-ray screening and 24.2% over no screening). LDCT screening resulted in slightly more QALYs: 147 years over chest X-ray screening and 250 years over no screening. However, in sensitive analysis, improvement in mortality was subtle or negative with LDCT (16 absolute, 5.4% relative reduction compared with no screening, 11 absolute, 4.1% reduction compared with chest X-ray) in worst case and the gain of QALY in low-dose CT screening over no screening would diminish if screening was performed among populations with a low prevalence of lung cancer below 436 per 100,000. Besides, the costs of LDCT screening, there were 9387 false diagnoses (3.76 times over chest X-ray) and 7 deaths due to false diagnosis (3.50 times over chest X-ray).

**Conclusion:** Our findings favor conducting LDCT screening in urban China in terms of mortality outcome. However, approaches to reducing false diagnoses and optimizing other screening conditions are highly needed to maximize benefits and minimize harms associated with this screening device.

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**Notes:**

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