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Title:	MODELING OF RISKS AND BENEFITS OF LUNG CANCER SCREENING STRATEGIES USING LOW-DOSE HELICAL CT (LDCT) TECHNOLOGY IN CANADA
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OBJECTIVES: Lung cancer is the most common cause of death from cancer worldwide. Yet, screening for lung cancer remains controversial. We compared the risks and benefits of lung cancer screening with low-dose helical CT (LDCT) relative to chest x-ray (CXR). Concerns have been raised about recommending LDCT as a routine screening tool because of the potential harms, including cumulative radiation risks. **METHODS:** We developed a decision analytic model to compare LDCT and CXR under alternative screening scenarios, and estimate the number of radiation-induced cancers due to LDCT and CXR exposure. The age and sex specific model was calibrated for Canada, using National Lung Screening Trial (NLST) and Prostate, Lung, Colorectal and Ovarian trial (PLCO) data. Three alternative strategies were compared: regular screening with LDCT, screening with CXR, and no screening. **RESULTS:** We compared radiation risks to estimated cancers prevented, using age and gender- specific projections. The average effective radiation dose for LDCT is only 22% (1.4 mSv) of the standard chest CT (7 mSv). However, the effective dose might be 20% to 23% higher for females than males. The average effective dose for CXR ranges 0.01 mSv - 0.06 mSv. LDCT showed a 20% reduction in lung cancer mortality compared to CXR. This translated into 3 fewer deaths from lung cancer per 1000 high-risk individuals screened with LDCT. However, more than 90% of positive screened results were false positive findings. Over 97% of new lung cancer cases are in high-risk adults aged 50 years and older. **CONCLUSIONS:** Concerns have been raised about recommending LDCT as a routine screening tool for lung cancer. Our model addresses a number of public policy questions regarding who should be targeted for screening and what the trade-offs are in terms of potential harms and benefits.