

Supplementary materials

Study design

Inclusion criteria differences between each strategy

	2021 USPSTF	CTFPHC	Quebec Pilot (55-74yrs)	Quebec Pilot 50-74yrs	PLCO ≥1.51%	PLCO ≥1.7%	PLCO ≥2%
PLCO threshold	-	-	≥2%	≥2%	≥1.51%	≥1.7%	≥2%
Age inclusion	50-80	55-74	55-74	50-74	-	-	-
Smoking inclusion criteria	- Smokers or smoking quit-time less than 15 years - At least 20 pack-year smoking history	- Smokers or smoking quit-time less than 15 years - At least 30 pack-year smoking history	- Smokers or former smokers	- Smokers or former smokers	-	-	-

Statistical analysis

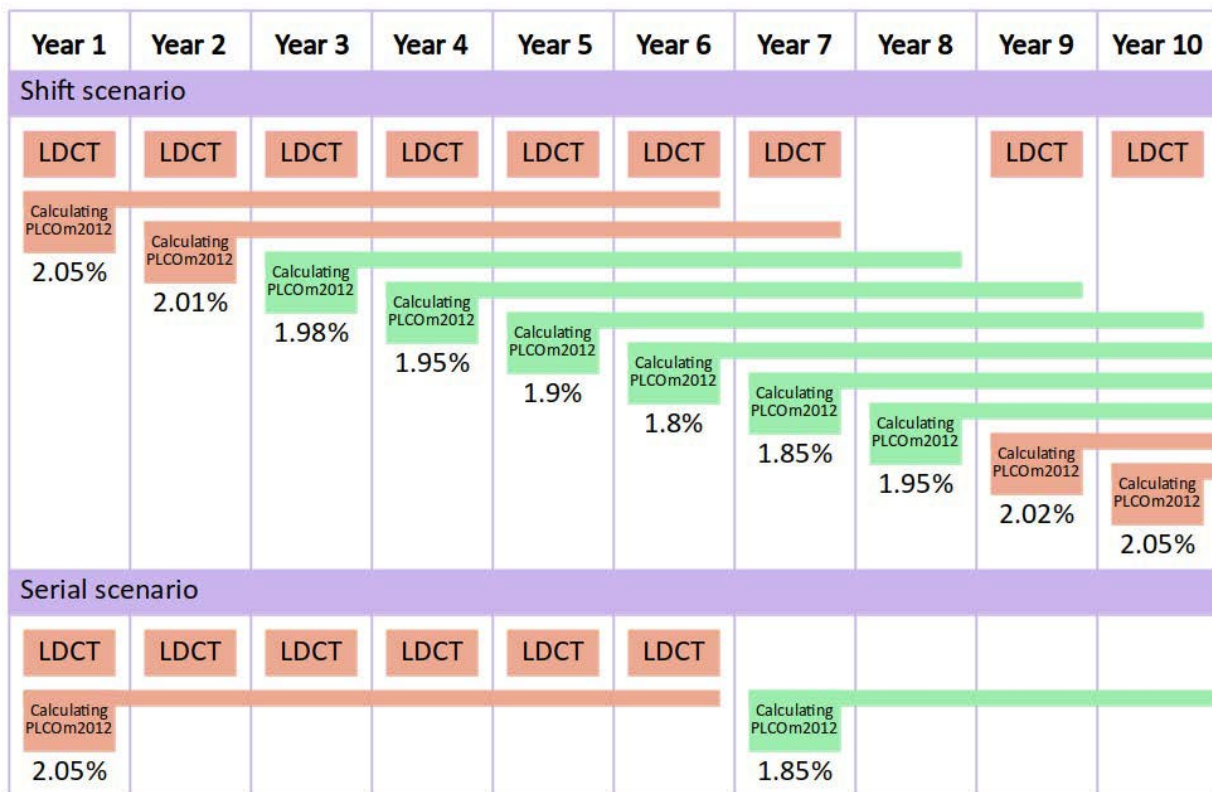
For the PLCOm2012 logistic model, the individual 6-year absolute risk of lung cancer is estimated as:

$$p_i = \frac{\exp\left(\alpha + \sum_{j=1}^{n_j} \beta_{ij} X_{ij}\right)}{1 + \exp\left(\alpha + \sum_{j=1}^{n_j} \beta_{ij} X_{ij}\right)}$$

where α is a baseline coefficient, β_j is the coefficient associated with the j^{th} risk factor (X_j) and X_{ij} is its value for individual i . Here, n_j is the number of variables included in the PLCOm2012 model. These coefficients and variable can be found in the Tammemägi *et al.* original article [1–3].

1. Tammemägi MC, Katki HA, Hocking WG, Church TR, Caporaso N, Kvale PA, et al. Selection Criteria for Lung-Cancer Screening. *N Engl J Med.* 2013 Feb 21;368(8):728–36.
2. Lung Cancer Risk Calculators [Internet]. Brock University. [cited 2021 Dec 10]. Available from: <https://brocku.ca/lung-cancer-screening-and-risk-prediction/risk-calculators/>
3. Tammemägi MC, Church TR, Hocking WG, Silvestri GA, Kvale PA, Riley TL, et al. Evaluation of the Lung Cancer Risks at Which to Screen Ever- and Never-Smokers: Screening Rules Applied to the PLCO and NLST Cohorts. *PLOS Medicine.* 2014 Dec 2;11(12):e1001764.

Figure 1. Comparison of the shift and serial screening scenarios for a theoretical participant. Note: LDCT = low-dose computed tomography. Percentages are the calculated PLCOm2012 risk. In this example, we considered a threshold of 2.00% for being screened. For the shift scenario, the PLCOm2012 risk is calculated each year. The participant has a risk higher than 2.00% during the year 1 and 2, leading to an LDCT scan each year until year 7. Risk remains less than 2.00% until the year 9; therefore, the participant had no LDCT during year 8. The risk was higher than 2.00% at year 9 and 10, leading to an LDCT scan each year until year 15. For the serial scenario, the PLCOm2012 risk score is calculated every 6 years. The participant had a risk score higher than 2.00% during the year 1; therefore, the participant had an LDCT scan each year until year 7. The risk score was calculated at year 8, with a score lower than 2.00%; therefore, the participant did not have an LDCT scan during the next 6 years. For the Quebec pilot model, these scenarios were the same, but no LDCT was done if the participant was outside the age range.



Supplementary results

Table S1. Comparison of different computed tomography lung cancer screening inclusion criteria with a serial scenario, between 1998 and 2015 (n=8938)

	Quebec Pilot (55-74yrs) + PLCO \geq 2%	Quebec Pilot (50-74yrs) + PLCO \geq 2%	PLCO \geq 1.51% (no age criteria)	PLCO \geq 1.7% (no age criteria)	PLCO \geq 2% (no age criteria)
Total number of participants eligible to be screened*	1552 (17.4%)	1554 (17.4%)	2013 (22.5%)	1734 (19.4%)	1408 (15.8%)
Total number of LDCTs	11286	11661	18352	15284	11474
Number of lung cancers detected	78 (38%)	76 (37.1%)	98 (47.8%)	93 (45.4%)	81 (39.5%)
Number of LDCT for one cancer detected	144.7	153.4	187.3	164.3	141.7
Number of participants screened to detect one lung cancer	19.9	20.4	20.5	18.6	16.8
Number of LDCT before cancer detection per participant	7.4	7.7	8.7	8.3	7.0
Number of LDCT per cancer-free participants*	7.3	7.5	9.1	8.8	8.2
Sensitivity	38% [31.4-45.1]	37.1% [30.4-44.1]	47.8% [40.8-54.9]	45.4% [38.4-52.4]	39.5% [32.8-46.6]
Specificity	92.6% [92.5-92.7]	92.4% [92.2-92.5]	88.0% [87.8-88.1]	90.0% [89.8-90.1]	92.5% [92.4-92.6]
Positive predictive value	5.0% [4.0-6.2]	4.9% [3.9-6.1]	4.9% [4-5.9]	5.4% [4.4-6.5]	6.0% [4.8-7.3]

LDCT: low-dose computed tomography; USPSTF: US Preventive Services Task Force

Serial scenario: we checked eligibility each 6 years. If a participant met the inclusion criteria, he/she had a LDCT per year during 6 years. Otherwise, no LDCT was made until the next screening.

* only participants with at least one LDCT