Associazione Italiana di Epidemiologia
Bari , 2012

Can a national lung cancer screening programme in combination with smoking cessation policies bring about an early decrease in tobacco deaths in Italy?

Giulia Carreras, Giuseppe Gorini, Eugenio Paci

ispo | CANCER PREVENTION AND RESEARCH INSTITUTE

Impatto dell'introduzione di politiche di controllo del tabagismo in Italia

Progetto CCM

"Scenari futuri dell'abitudine al fumo in Italia tramite modelli di simulazione di impatto di politiche di controllo del tabagismo"

Programma CCM 2010

PI: Giuseppe Gorini, ISPO, Firenze

Metodi

- Viene simulata l'introduzione nel 2010 di ogni politica singolarmente o in combinazione e ne viene stimato l'effetto in termini di:

- diminuzione di prevalenza di fumo e di numero di fumatori

- Riduzione dei decessi attribuibili a fumo

sulla base della Letteratura di riferimento e di un modello di simulazione creato per gli Stati Uniti e adattato all'Italia a cui sono stati applicati i dati ISTAT di prevalenza di fumo e di mortalità

Per approfondimenti metodologici

- Levy D, Gallus S, Blackman K, Carreras G, LA Vecchia C, Gorini. Italy SimSmoke: the effect of tobacco control policies on smoking prevalence and smoking attributable deaths in Italy. BMC Public Health. 2012;12(1):709
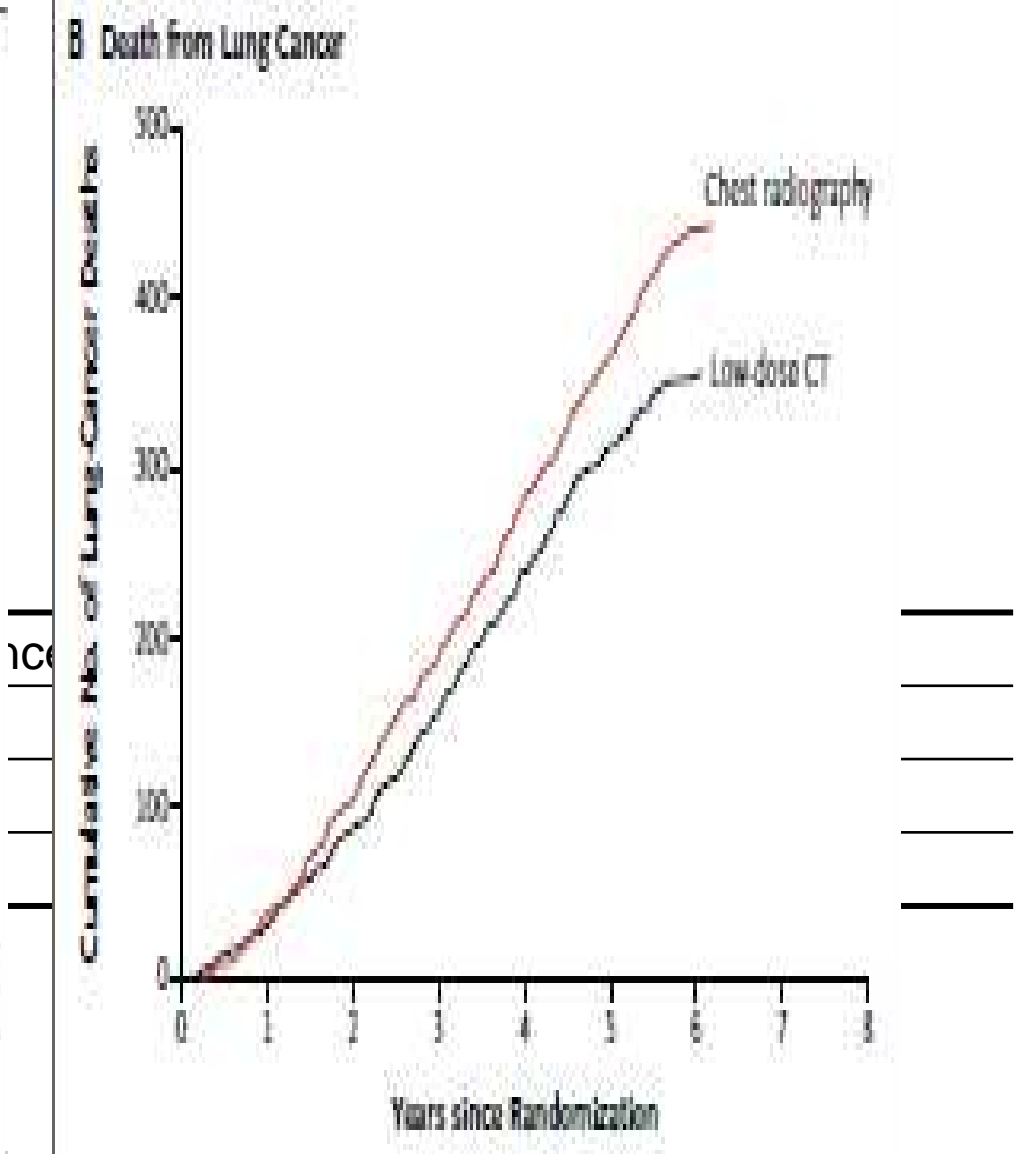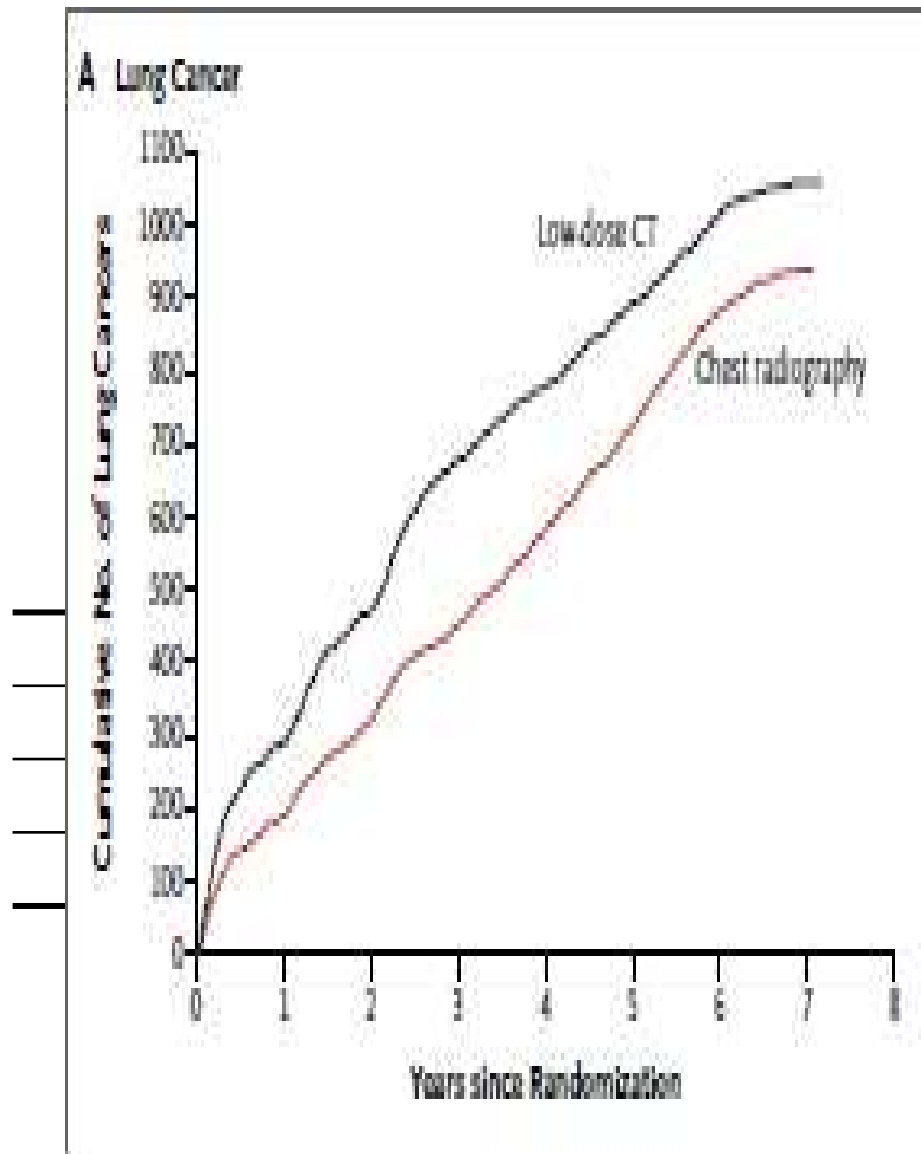
NLST

National Lung
Screening Trial

National Cancer Institute

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NLST

RCTs

	NLST	Europe
LDCT arm	26722	16558
Control arm	26732	15820
Total enrolled	53454	36378

	NELSON	DLCST	LUSI	DANTE	ITALUNG	MILD	UKLS
LDCT	7557	2052	1780	1276	1613	2280	2000
Control arm	7907	2052	1771	1196	1593	1301	2000
Total	15464	4104	3551	2472	3206	3581	4000

**International workshop on
lung cancer screening randomized trials.
State of the art in Europe after
early conclusion of the US National Lung Screening Trial
The European Lung Cancer Trials (EULCT)
The PISA Position Statement**
Pisa (Italy), March 4, 2011

- **The shared opinion of the trial investigators is that EULCT trials should continue and evaluate the full effect of screening with low-dose CT scan compared with non-screening (usual care) populations, in terms of mortality reduction as well as harmful side effects. The EULCT investigators decided to evaluate the feasibility of a combined interim analysis of the European randomized trials during 2011, while the trials will continue until the planned end.**

Health Technology Assessment
I problemi aperti

- **Selezione dei soggetti ad alto rischio per tumore del polmone (MMG, Biomarkers)**
- **Proporzione di richiami per accertamenti sia di diagnostica per immagini che invasivi (learning, CAD, Biomarkers)**
- **Sovradiagnosi e sovratrattamento (indicatori di aggressività)**
- **Costi-benefici**
- **Impatto delle politiche antifumo-sussidiarietà dello screening**

Research Article

Can a National Lung Cancer Screening Program in Combination with Smoking Cessation Policies Cause an Early Decrease in Tobacco Deaths in Italy?

Giulia Carreras[1], Giuseppe Gorini[1], and Eugenio Paci[2]

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Objective

to predict smoking attributable deaths for lung cancer and all causes in Italy, 2015-2040, assuming:

1. yet unimplemented tobacco control policies

2. a national, three-round annual lung cancer screening programme with low-dose CT for heavy and former heavy smokers

Methods - 1

- A dynamic model describing the evolution of smoking habits in Italy was developed
  - to estimate quit rates, 1986-2009
  - to predict smoking attributable deaths under different scenarios

- Smoking prevalence data from the Italian Institute of Statitistics (ISTAT)

Scheme of the forecasting model used to compute the prevalence of smoking among Italians over time
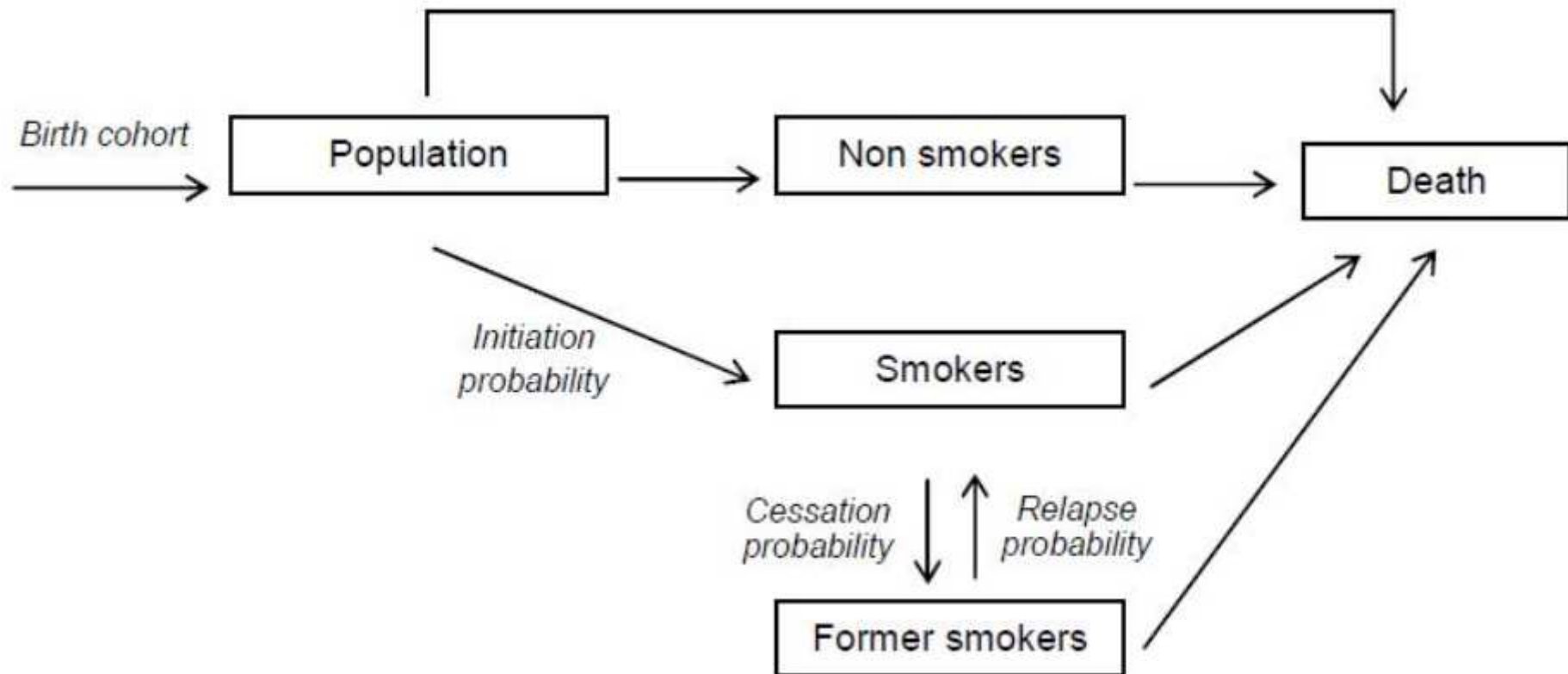
Scenarios of future predictions

- 1-Keeping the status quo
- 2-Raising cigarette taxes by 20%
- 3-Implementing cessation treatment policies:
  - funding treatment, setting-up an active quit-line, promoting counselling among health professionals
- 4-Introducing a three-round annual lung cancer screening programme with low-dose CT
  - for current and former heavy smokers aged 55-74 years, with a 70% compliance, and a 20% lung cancer mortality reduction
- 5-Combining 2,3,4.

Results - 1

Tobacco control policies showed:

1. a steadily strengthening effect starting from 5-10 years after implementation.

   Example: smoking attributable deaths for lung cancer under cessation treatment policies were reduced by 8.4% in 2030, and by 16.1% in 2040

2. gave a greater effect than lung cancer screening in reducing mortality for all causes

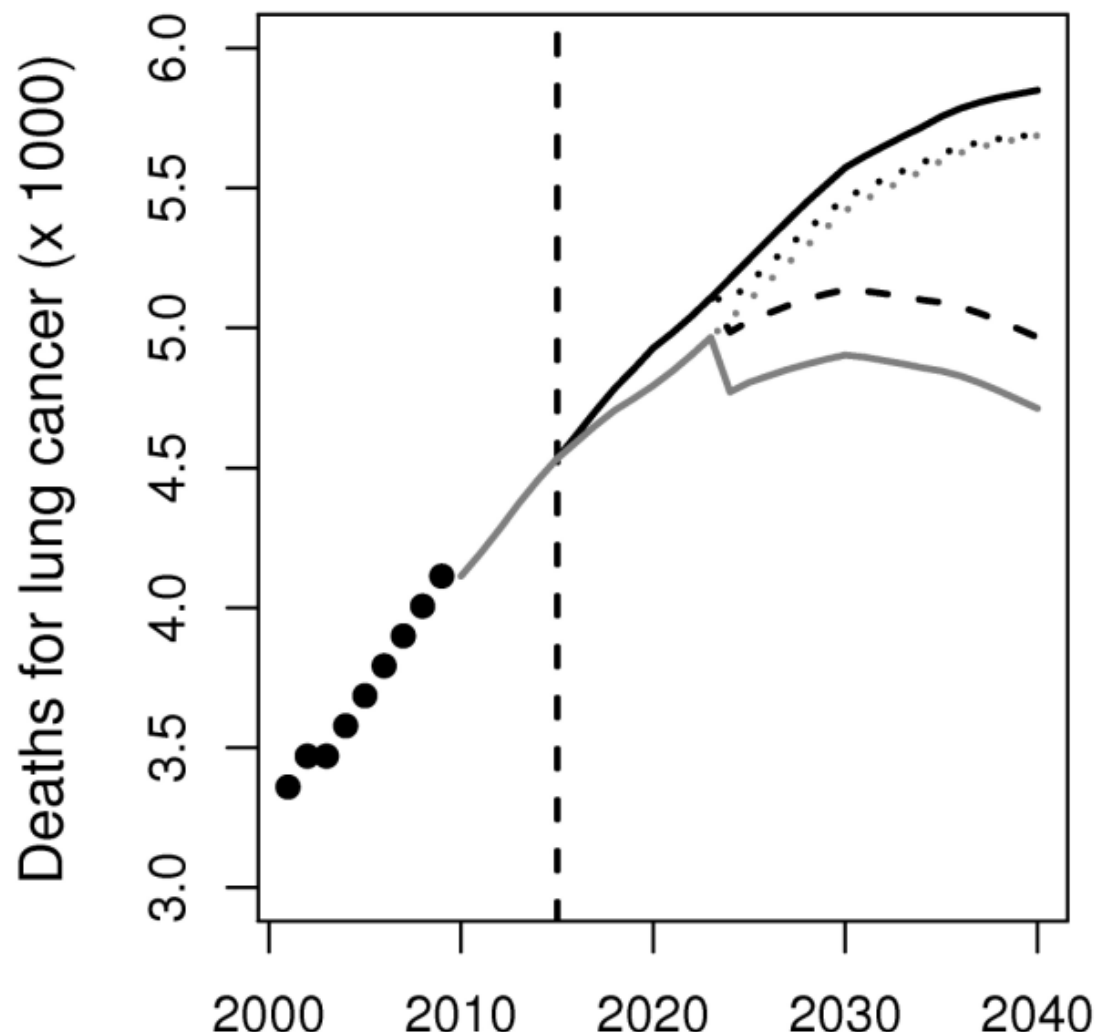   cessation brought about a reduction in smoking-related mortality other than lung cancer and respiratory diseases

Results - 2

The lung cancer screening programme brought:

1. a 3.0% constant annual reduction in smoking attributable deaths for lung cancer, relative to the status quo scenario

2. decreased or postponed smoking attributable deaths for all causes by 1.7% annually (a half due to respiratory diseases), relative to the status quo scenario

3. The effect was noticeable after few years from its introduction.

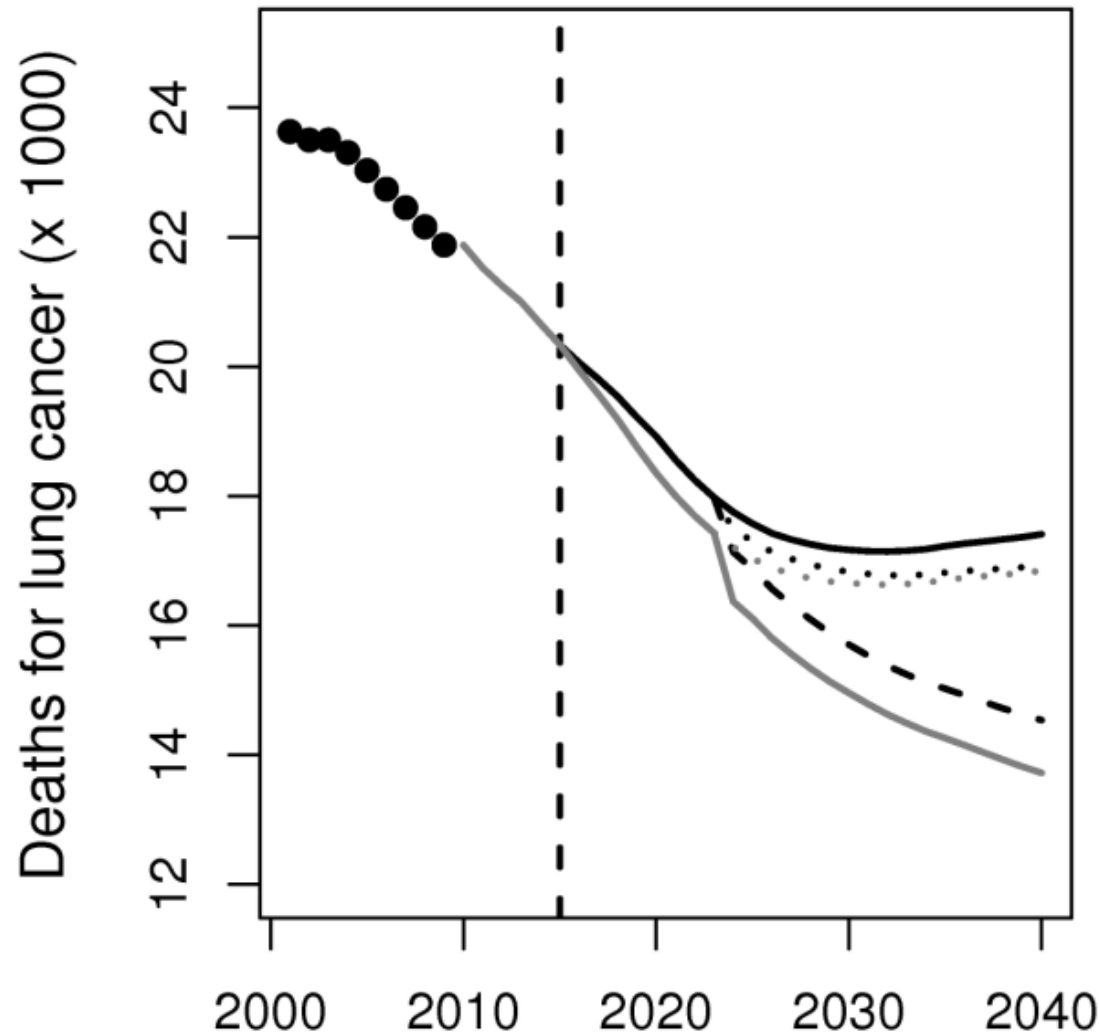Future smoking attributable deaths for lung cancer, Italy, 2015-40, women

Smoking attributable deaths **for lung cancer**, status quo scenario, number of lives saved in the 4 preventive scenarios (% decline with respect to the status quo), **women**

Scenario / year	2015	2020	2030	2040
1. Status Quo	4,533	4,929	5,573	5,849
2. Tax policy	0	0	109 (2.0)	157 (2.8)
3. Cessation treatment Policies	0	0	436 (8.5)	883 (17.8)
4. Low-dose CT scan screening, 70% compliance	0	134 (2.8)	154 (2.8)	162 (2.8)
5. 2+3+4	0	134 (2.8)	670 (13.7)	1,137 (24.1)

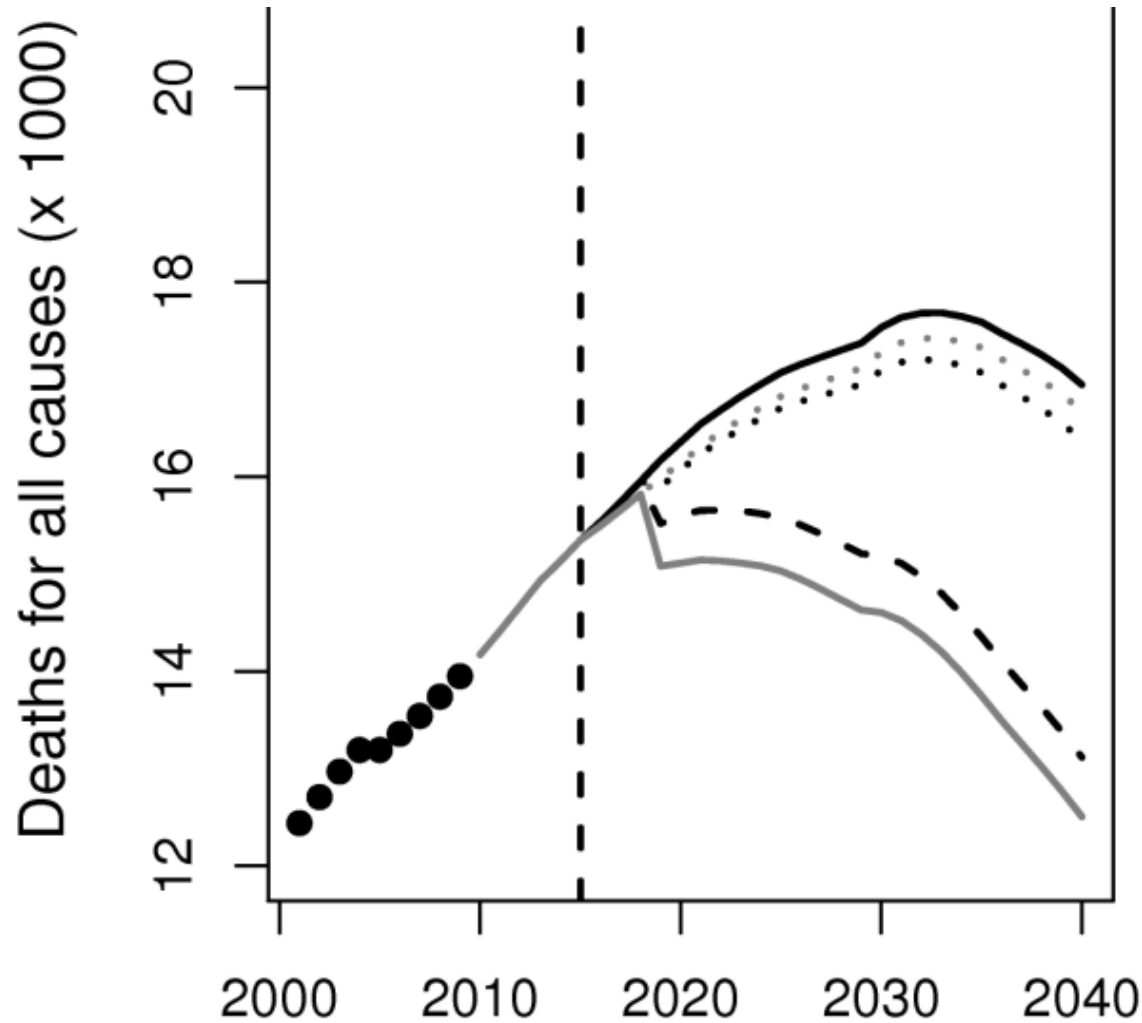Future smoking attributable deaths for lung cancer, Italy, 2015-40, men

Smoking attributable deaths **for lung cancer**, status quo scenario, number of lives saved in the 4 preventive scenarios (% decline with respect to the status quo), **men**

Scenario / year	2015	2020	2030	2040
1. Status Quo	**20,337**	**18,923**	**17,169**	**17,410**
2. Tax policy	0	0	339 (2.0)	481 (2.8)
3. Cessation treatment Policies	**0**	**0**	**1,463 (9.3)**	**2,871 (19.7)**
4. Low-dose CT scan screening, 70% compliance	**0**	**567 (3.1)**	**513 (3.1)**	**564 (3.4)**
5. 2+3+4	0	567 (3.1)	2,211 (14.8)	3,687 (26.9)

Future smoking attributable deaths for all causes, Italy, 2015-40, women

Smoking attributable deaths **for all causes**, status quo scenario, number of lives saved in the 4 preventive scenarios (% decline with respect to the status quo), **women**

Scenario / year	2015	2020	2030	2040
1. Status Quo	15,348	16,358	17,534	16,946
2. Tax policy	0	289 (1.8)	443 (2.6)	574 (3.5)
3. Cessation treatment Policies	0	749 (4.8)	2346 (15.4)	3830 (29.2)
4. Low-dose CT scan screening, 70% compliance	0	224 (1.4)	257 (1.5)	374 (2.3)
5. 2+3+4	0	1,245 (8.2)	2,930 (20.1)	4,526 (36.4)

Future smoking attributable deaths for all causes, Italy, 2015-40, men

Deaths for all causes (x 1000)

Legend:
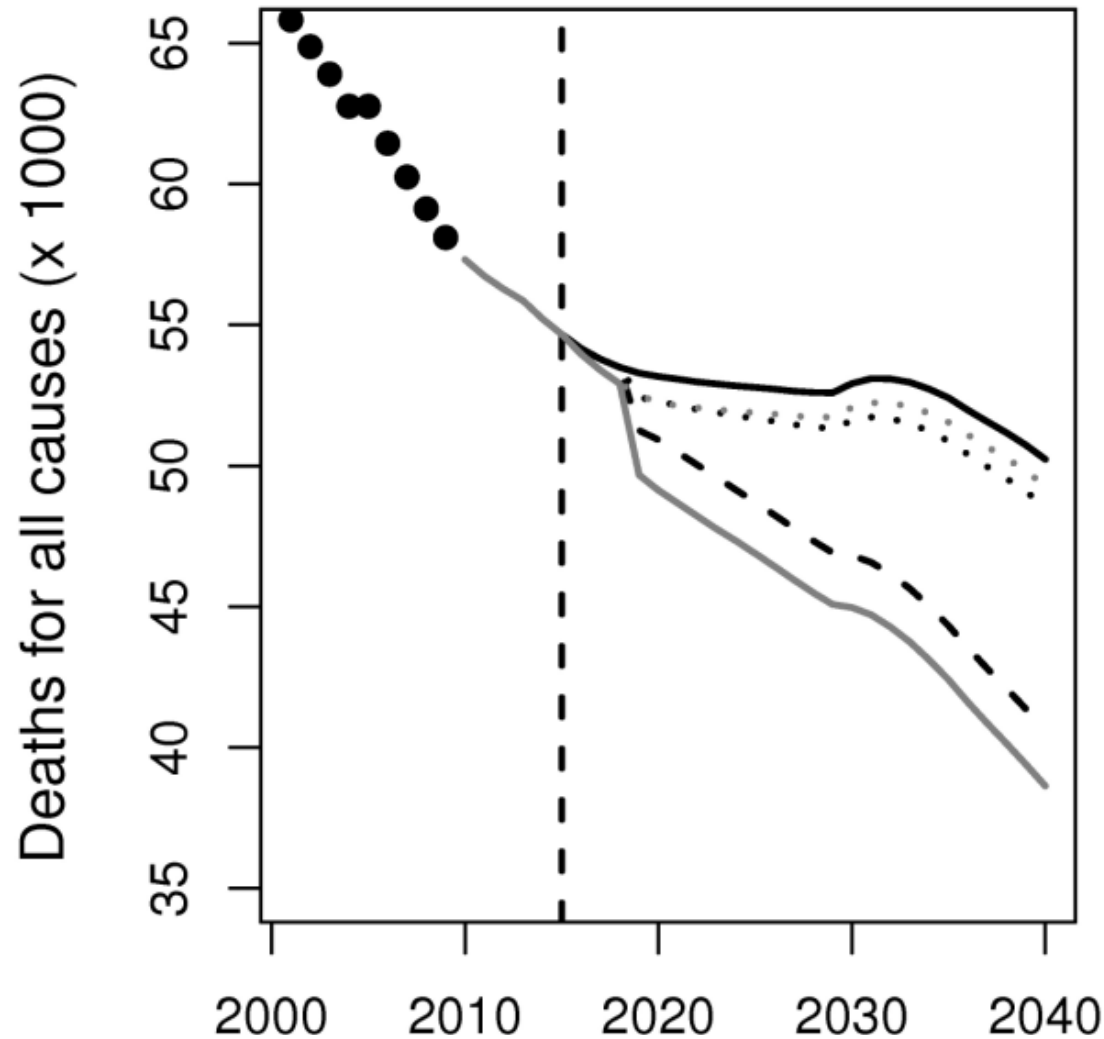1. sq
2. tax
3. cess tr
4. screen
2.+3.+4.

Smoking attributable deaths **for all causes**, status quo scenario, number of lives saved in the 4 preventive scenarios (% decline with respect to the status quo), **men**

Scenario / year	2015	2020	2030	2040
1. Status Quo	**54,671**	**53,169**	**52,920**	**50,229**
2. Tax policy	**0**	**893 (1.7)**	**1,317 (2.6)**	**1,674 (3.4)**
3. Cessation treatment Policies	**0**	**2,251 (4.4)**	**6,101 (13.0)**	**9,621 (23.7)**
4. Low-dose CT scan screening, 70% compliance	**0**	**945 (1.8)**	**855 (1.6)**	**941 (1.9)**
5. 2+3+4	**0**	**4,040 (8.2)**	**7,948 (17.7)**	**11,594 (30.0)**

Conclusions

tobacco control policies + lung cancer screening programme:

1. an early decrease in lung cancer and respiratory disease mortality due to the screening programme

2. followed by a more substantial drop in mortality for all causes in subsequent decades due to the implementation of tobacco control policies