

# New recommendations on cancer screening

## Across the globe

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## European Health Union: Commission welcomes adoption of new EU cancer screening recommendations

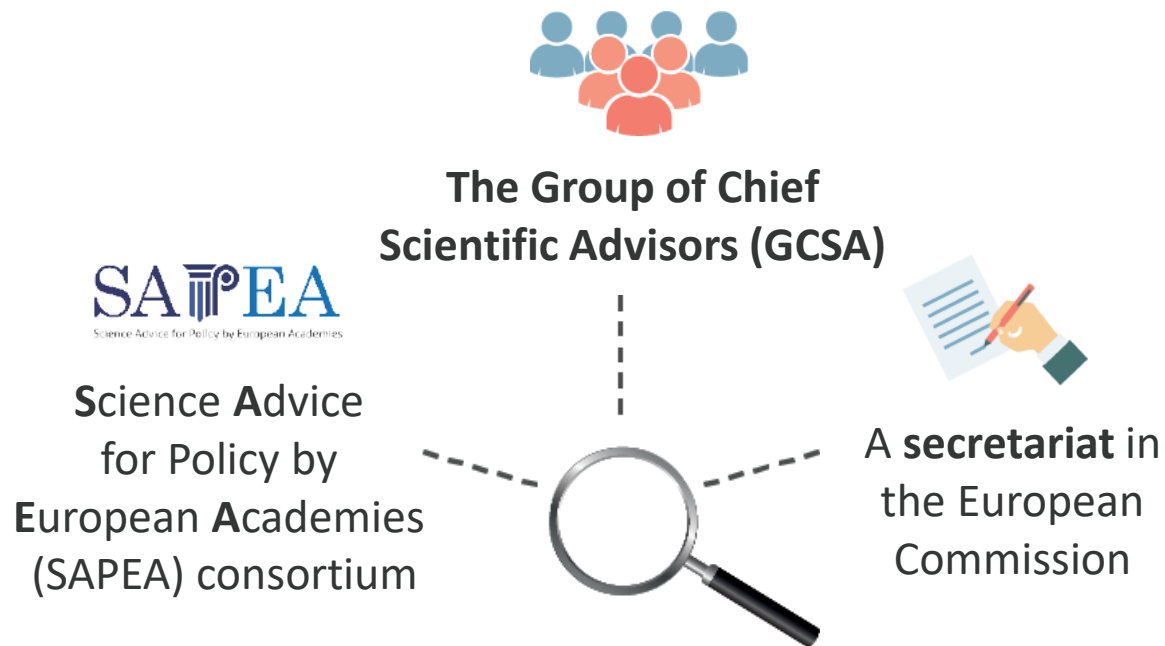
Brussels, 9 December 2022

Today, following the Commission's proposal to strengthen cancer prevention through early detection, the Council of the European Union has adopted a [new approach on cancer screening](#). This is an important step to improve early detection throughout the EU, an important goal of the [Europe's Beating Cancer Plan](#).

As [announced](#) in September, this new EU approach, based on the latest available scientific developments and evidence, will help **ensuring that 90% of the EU population who qualify for breast, cervical and colorectal cancer screenings are offered such screening by 2025**. The new approach also calls for extending screening programmes to prostate, lung and, under certain circumstances, gastric cancer, in a stepwise approach. The Recommendation is part of a new EU Cancer Screening Scheme, put forward as a flagship initiative of Europe's Beating Cancer Plan.



# How the Scientific Advice Mechanism (SAM) works



**Three pillars ensure that the advice is based on top science, multidisciplinary and as unbiased as possible**



Scientific advice for well-informed policy and better regulation



Transparent and as free from bias as possible



Complementary to other scientific advice bodies in and beyond the EU institutions

# Cancer Screening Evidence Review Report

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**SAPEA**

Science Advice for Policy by European Academies

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**SAPEA**  
Science Advice for Policy by European Academies

**Key Question: What is the scientific basis of extending screening programmes to other cancers, e.g., lung, prostate and oesophago-gastric cancers, and ensuring their feasibility throughout the EU?**

These cancers were selected based on disease burden measured by:

- overall mortality
- disability-adjusted life-years
- screening test performance evaluated in large-scale trials.

Consideration of other cancer types where more targeted screening of high-risk individuals may be beneficial, such as liver or pancreatic cancer, is not considered here but general findings may be relevant.

3 rapid reviews conducted by methodology and subject experts at Cardiff University and University of Cambridge



# Should we extend screening programmes?

## Lung cancer

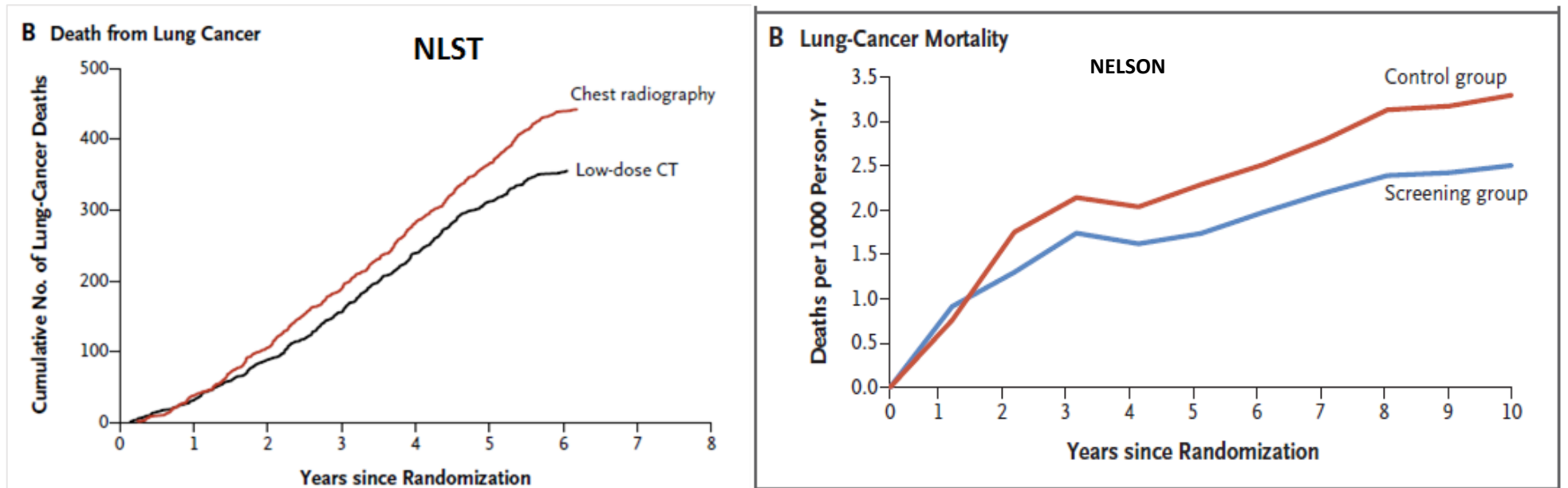
- High disease burden accounting for 20% cancer deaths in EU
- Two large-scale RCTs show low dose CT scanning (LDCT) reduce cancer mortality for smokers and ex-smokers aged 50 to 80 years
- Burden and possible harms of low dose scanning are limited
- Two systematic reviews (12 studies) suggest cost-effective strategies
- US Preventative Service Task Force are recommending LDCT for >50 years at least 20 pack-years and ex-smokers <15 years
- Pilots in UK and some EU countries suggest broad acceptance and provide an opportunity for effective smoking cessation advice



# Should we extend screening programmes?

## Lung cancer

- High disease burden accounting for 20% cancer deaths in EU
- Two large-scale RCTs show low dose CT scanning (LDCT) reduce cancer mortality for smokers and ex-smokers aged 50 to 80 years



*The experts therefore find a strong scientific basis for extending cancer screening programmes in EU to lung cancer screening based on effectiveness and burden*



Considering the preliminary evidence for screening with use of low-dose computed tomography, and the need for a stepwise approach, countries should explore the feasibility and effectiveness of this programme, for instance by using implementation studies.

The programme should integrate primary and secondary prevention approaches, starting with high risk individuals. Special attention should be given to the identification and targeting of high risk profiles, starting with heavy smokers and ex-smokers who used to smoke heavily, and Member States should further research how to reach and invite the target group, as there is no systematic data (documentation) on smoking behaviour.



# Should we extend screening programmes?

## Prostate cancer

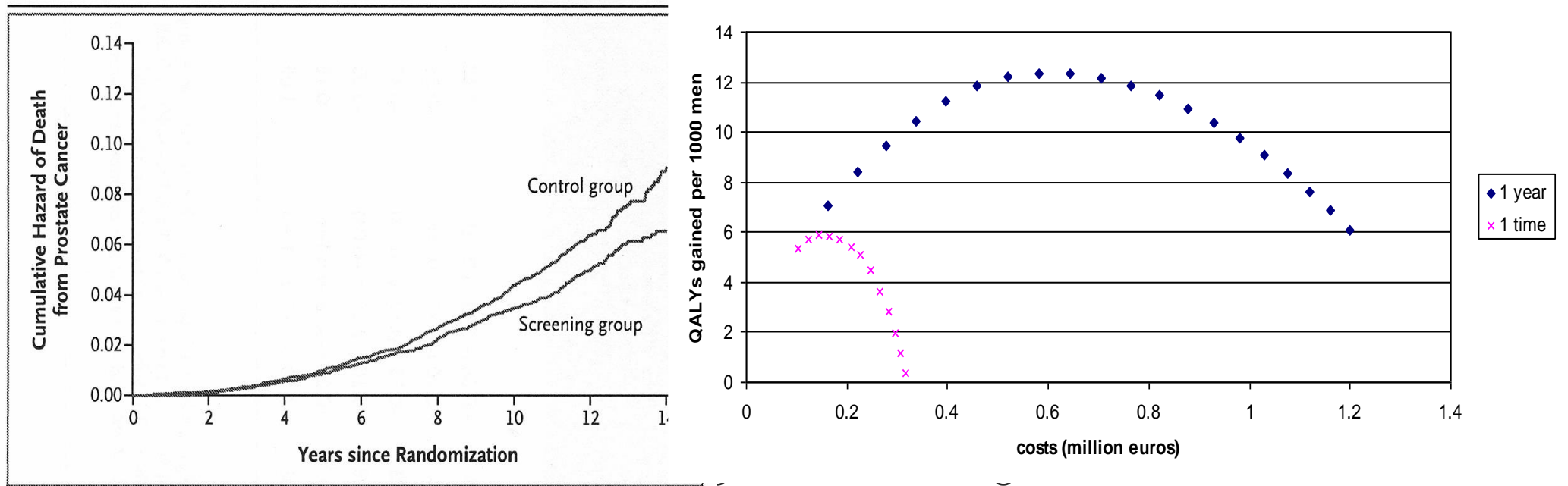
- Prostate cancer is the most commonly diagnosed cancer and the leading cause of cancer death in non-smoking European men
- Large European powered RCT and meta-analysis shows screening via low threshold prostate specific antigen (PSA) reduces prostate cancer mortality in men aged 55-69
- Burden and possible harms of testing for individuals can be substantial, but additional tests such as MRI (reflex testing), and existing guidelines on Active Surveillance are likely to reduce harms or overdiagnosis
- Securing enough MRI scanning resource and quality may be challenging in some EU member states. Bi-parametric MRI maybe more feasible and cost-effective
- Opportunistic PSA testing outside of organized screening can lead to harms



# Should we extend screening programmes?

## Prostate cancer

- Prostate cancer is the most commonly diagnosed cancer and the leading cause of cancer death in non-smoking European men



*The experts find the scientific basis for organised prostate cancer screening quite strong provided that the age criteria are appropriate. The high levels of opportunistic PSA testing at older ages can lead to overdiagnosis and harm. Likely that MRI (and active surveillance) will become part of prostate screening protocols to further improve net-benefit for individuals.*



Considering the preliminary evidence and the significant amount of ongoing opportunistic screening, countries should consider a stepwise approach, including piloting and further research, to evaluate the feasibility and effectiveness of the implementation of organised programmes aimed at ensuring appropriate management and quality on the basis of prostate-specific antigen (PSA) testing for men, in combination with additional magnetic resonance imaging (MRI) scanning as a follow-up test.

# Should we extend screening programmes?

## Ovarian cancer

- Large RCT and 1 systematic review on screening for ovarian cancer using serial CA125 with transvaginal ultrasound or ultrasound alone did not find a beneficial effect
- **Neither the experts nor the literature found scientific grounds to recommend ovarian cancer screening for EU Member States at the current time**

*Further research is needed to identify improved technological approaches for this lethal cancer*



# Should we extend screening programmes?

## Gastric cancer

- Gastric cancer rates are falling with improvements in living conditions and reduction in *H. pylori* infection rates
- Insufficient evidence to recommend endoscopic screening of the gastric mucosa across all EU member states
- The screen and treat strategy for reducing *H. pylori* infection provides good opportunity to prevent gastric cancer in EU member countries with intermediate to high gastric cancer incidence
  
- Screen-and-treat strategies for *Helicobacter pylori*, including implementation studies, should be considered in those countries or regions inside countries with high gastric cancer incidence and death rates. Screening should also address strategies for identification and surveillance of patients with precancerous stomach lesions unrelated to *Helicobacter pylori* infections.



The expert group finds that an upper age limit on cancer screening at population level can address the issue that the number of cancers that will be found with no or marginal net-benefit for the individual will increase with age.

Further research is needed to determine the age at which cancer screening should stop, and whether this should be the same for all individuals and cancer types.

Research is also needed to determine whether there is a minimum level of individual risk for a given type of cancer that is required to take part in a screening programme in the first place, and how this should be measured and implemented in practice.

# Workshop 2

**Key Question: How can cancer screening programmes targeting breast, cervical and colorectal cancers, be improved throughout the EU?**

Despite the EU-wide commitment to cancer screening, significant inequalities in access to the current types of screening still exist between individual member states, as well unequal coverage within countries.



# Workshop 3

Key Question: Which are the main scientific elements to consider, and best practices to promote, for optimizing risk-based cancer screening and early diagnosis throughout the EU?



Figure taken from Pashayan et al., 2020





# USPSTF recommendations LC 2021

## Recommendation Summary

Population	Recommendation	Grade
Adults aged 50 to 80 years who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years	The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 50 to 80 years who have a 20 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.	<b>B</b>

## Recommendation Summary PC screening 2018

Population	Recommendation	Grade
Men aged 55 to 69 years	<p>For men aged 55 to 69 years, the decision to undergo periodic prostate-specific antigen (PSA)-based screening for prostate cancer should be an individual one. Before deciding whether to be screened, men should have an opportunity to discuss the potential benefits and harms of screening with their clinician and to incorporate their values and preferences in the decision. Screening offers a small potential benefit of reducing the chance of death from prostate cancer in some men. However, many men will experience potential harms of screening, including false-positive results that require additional testing and possible prostate biopsy; overdiagnosis and overtreatment; and treatment complications, such as incontinence and erectile dysfunction. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the balance of benefits and harms on the basis of family history, race/ethnicity, comorbid medical conditions, patient values about the benefits and harms of screening and treatment-specific outcomes, and other health needs. Clinicians should not screen men who do not express a preference for screening.</p>	<b>C</b>
Men 70 years and older	<p>The USPSTF recommends against PSA-based screening for prostate cancer in men 70 years and older.</p>	<b>D</b>

# AUSTRALIAN NATIONAL LUNG CANCER SCREENING PROGRAM

## Description of Medical Service

Lung cancer is the leading cause of death from cancer for both men and women in Australia. The aim of the National Lung Cancer Screening Program (NLCSP) is to support the earlier detection of lung cancer through the use of low dose computed tomography (LDCT) in high risk individuals (smokers and ex-smokers). A risk prediction tool will be applied to those entering the Program to assess their suitability for screening. If a person's risk assessment meets a threshold level, they will be offered LDCT screening. Screening will be every two years while they participate in the program, or until a lesion requiring management is identified.

**Table 5: Overview of selected outcomes of NLST-like biennial screening scenarios (simple non-dominated)**

Scenario	Percentage of the population ever screened	Number of performed CT screens	Lung cancer mortality reduction (%)	Lung cancer deaths prevented	Non-discounted life-years gained	5% discounted QALYS gained	Life-years gained per lung cancer death prevented	Non-discounted QALYS gained per lung cancer death prevented	Over-diagnosed lung cancers	Percentage of screen-detected cancers that is over-diagnosed	Lung cancer deaths prevented per over-diagnosed case*	False positive screens*
NLST #116 (30-20; 50-70)	7.7%	1,445,807	3.5%	5,112	48,960	20,068	9.58	8.52	2,057	13.1%	2.49	47,134
NLST #113 (30-15; 50-70)	6.6%	1,179,540	3.1%	4,622	43,988	18,154	9.52	8.47	1,881	13.2%	2.46	38,090
NLST #110 (30-10; 50-70)	5.3%	906,158	2.8%	4,080	38,628	16,042	9.47	8.43	1,644	13.1%	2.48	28,914
NLST #122 (30-15; 55-70)	6.2%	1,085,380	2.8%	4,095	40,556	16,834	9.90	8.85	1,563	12.6%	2.62	34,790
NLST #119 (30-10; 55-70)	5.0%	836,924	2.5%	3,644	35,730	14,919	9.81	8.77	1,371	12.4%	2.66	26,538
NLST #146 (30-10; 55-74)	5.9%	1,083,017	3.6%	5,306	46,008	19,012	8.67	7.70	2,734	15.6%	1.94	34,988
NLST #125 (30-20; 55-70)	7.3%	1,322,860	3.0%	4,469	44,302	18,286	9.91	8.86	1,690	12.5%	2.64	42,843
NLST #149 (30-15; 55-74)	7.4%	1,423,342	4.1%	6,025	52,690	21,587	8.74	7.77	3,152	15.8%	1.91	46,540
NLST #112 (20-15; 50-70)	9.1%	1,619,848	3.6%	5,281	51,098	20,993	9.68	8.61	2,147	13.1%	2.46	52,284
NLST #145 (20-10; 55-74)	7.7%	1,421,442	4.0%	5,923	52,089	21,389	8.79	7.81	3,031	15.5%	1.95	46,078
NLST #140 (30-15; 50-74)	7.6%	1,499,169	4.5%	6,601	55,576	22,709	8.42	7.43	3,659	16.5%	1.80	49,181
NLST #152 (30-20; 55-74)	8.8%	1,769,381	4.6%	6,724	58,878	23,963	8.76	7.78	3,494	15.7%	1.92	58,489
NLST #121 (20-15; 55-70)	8.7%	1,493,886	3.2%	4,676	46,975	19,342	10.05	8.97	1,765	12.4%	2.65	47,861
NLST #143 (30-20; 50-74)	9.1%	1,869,424	5.0%	7,420	62,852	25,416	8.47	7.49	4,058	16.3%	1.83	61,988
NLST #136 (20-10; 50-74)	7.9%	1,491,782	4.4%	6,410	54,515	22,313	8.51	7.53	3,533	16.3%	1.81	48,521
NLST #117 (40-20; 50-70)	4.9%	897,995	2.7%	3,948	36,768	15,183	9.31	8.31	1,650	13.4%	2.39	29,112

**Table 7: Comparison (annualised) of Australian cancer screening programs**

<b>Program</b>	<b>Cervical</b>	<b>Cervical post HPV</b>	<b>Breast</b>	<b>Colorectal</b>	<b>Lung</b>
Number screened (M)	2.47	1.34	0.89	1.44	0.11 <sup>8</sup>
Deaths prevented	1185	153	580	2519	504 <sup>9</sup>
Cost (\$M)	223	126	316	1410	80 (Y6) <sup>10</sup>
Number needed to screen per death avoided	2085	8776	1528	572	85 <sup>11</sup>
Incremental cost per life-year gained (\$)	23,244	102,897	40,279**	3,380	56,891 <sup>12</sup>

Cervical from Lew et al (2019) – 5 yearly HPV/cytology 25-74 years of age

Breast from Lew et al (2019) – biennial mammography 50-74 years of age, \*\*underestimate, only includes BreastScreen costs, not costs for breast cancer treatment including to states/territories via the National Healthcare Reform Agreement

Colorectal from Lew et al (2019) – biennial iFOBT 50-74 years of age

## Estimates of effect for NL (17 million)

	Colorectal FIT	LUNG CT	Breast mmg	Prostate PSA	Cervical HPV
Deaths target group without screening	6,200	10,000	2,100	2,750	450
Cancer mort reduction	30%	35%	40%	27.5%	50%
<b>Number deaths prevented</b>	<b>2,250</b>	<b>1,600-2,600</b>	<b>1,000</b>	<b>650</b>	<b>250</b>
Life-years gained/death prevented	11	11	16	10	22
Screens NL*	1.6 million	300,000	1.1 million	215,000	450,000
<b>Cost</b>	<b>20 million</b>	<b>60 million</b>	<b>68 million</b>	<b>7 million</b>	<b>29 million</b>
Ages	55-75	55-80	50-75	55-64	30-60
Interval	2	1	2	3	5-10