The European Smoking History Generator (EU-SHG): Sizing the target population for lung cancer screening in the 27 EU Member States, 2025–2040

Alexander Dietz[1], Koen de Nijs[1], Preston Ngo[2], Eveline A.M. Heijnsdijk[1], Isabelle Soerjomataram[2], Harry J. de Koning[1]
on behalf of the LAPIN consortium

[1]Department of Public Health, Erasmus MC – University Medical Center Rotterdam · [2]International Agency for Research on Cancer

Introduction

The 2022 EU Council Recommendation asks all 27 Member States to explore low-dose CT screening. Each must first decide whom to invite.

Eligibility depends on **lifetime** smoking history, not current smoking:

Ages 50–79, 2025	Spain	Slovakia
Currently smoking	21%	21%
Eligible, USPSTF-2021	**20%**	**14%**
Eligible, PLCOm2012	**12%**	**8%**

Methods

1. Surveys → prevalence

2.37 million records, 5 European surveys and national data, 1979–2024

2. Prevalence → smoking histories

Initiation, intensity and cessation reconstructed for every cohort, country and sex. Surveys see only survivors, so mortality follows Human Mortality Database life tables and **EPIC-Europe** hazard ratios.

3. Histories → eligible population

USPSTF-2021 ≥20 pack-years, currently smoking or quit within 15 years.
PLCOm2012 6-year lung cancer risk ≥1.51%.
Both criteria: ages 50–79

Results

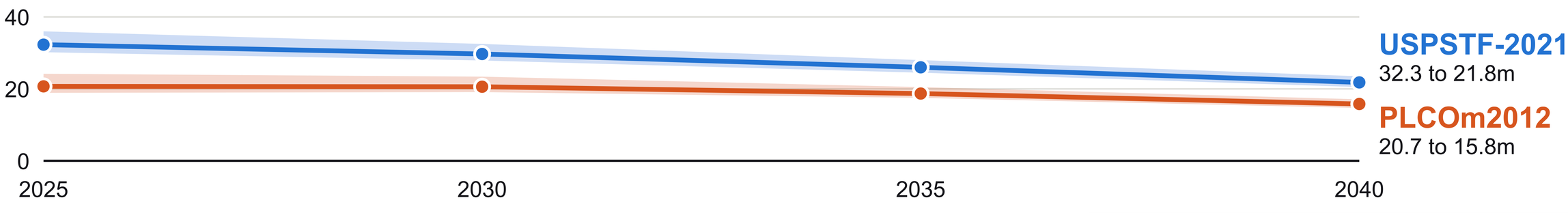
32 → 22

million meet **USPSTF-2021**, 2025 → 2040

21 → 16

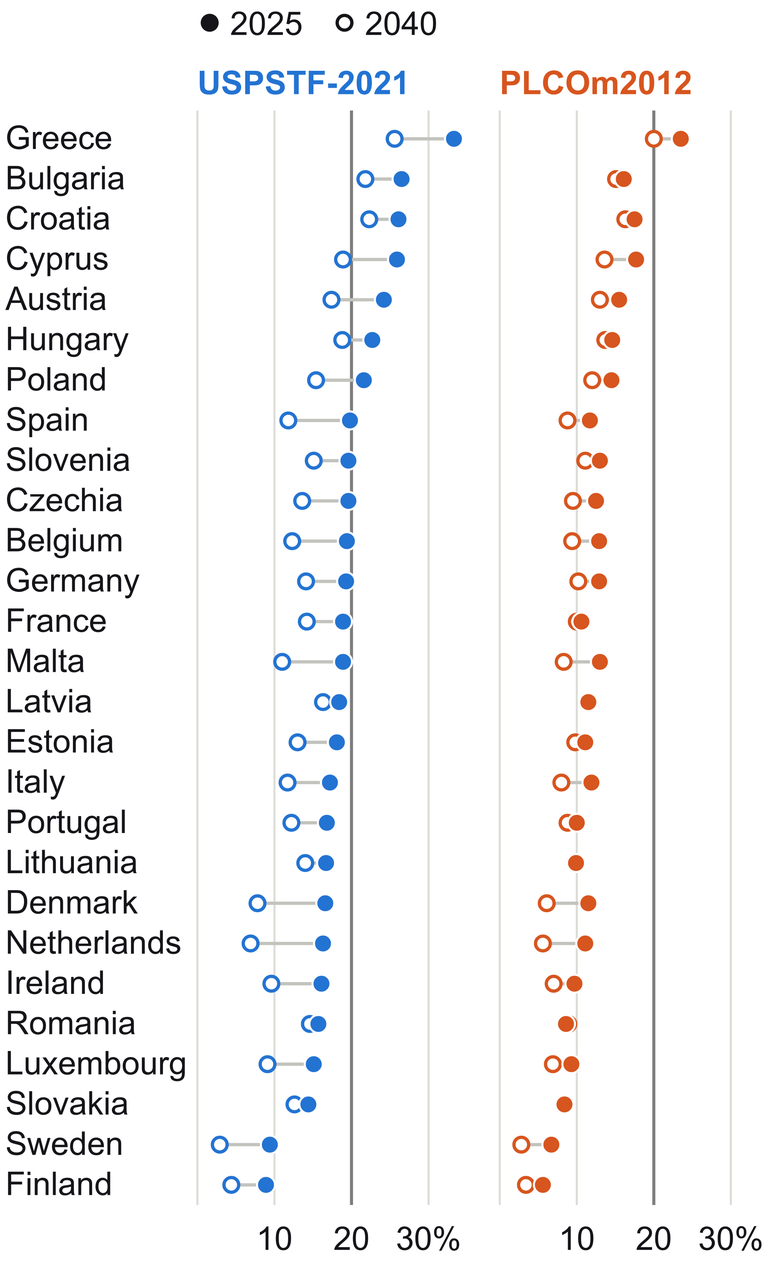
million meet **PLCOm2012**, 2025 → 2040

EU-27, millions aged 50–79. Shaded areas are 95% credible intervals



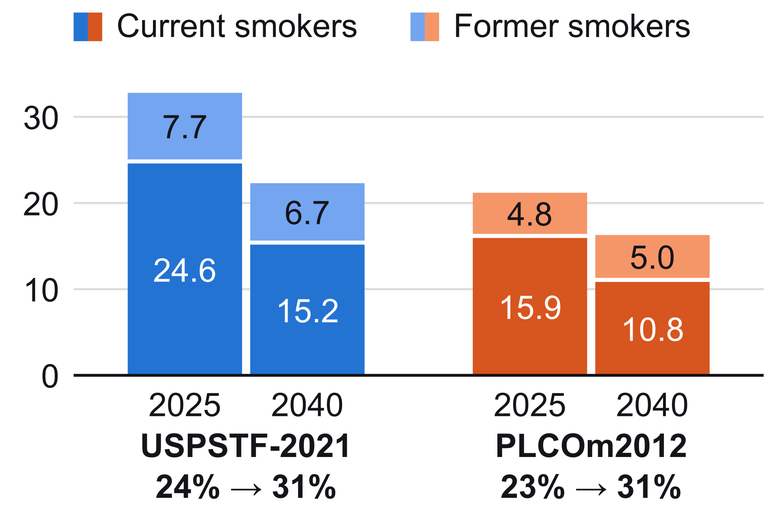
By Member State

Eligible share, 2025 and 2040



By smoking status

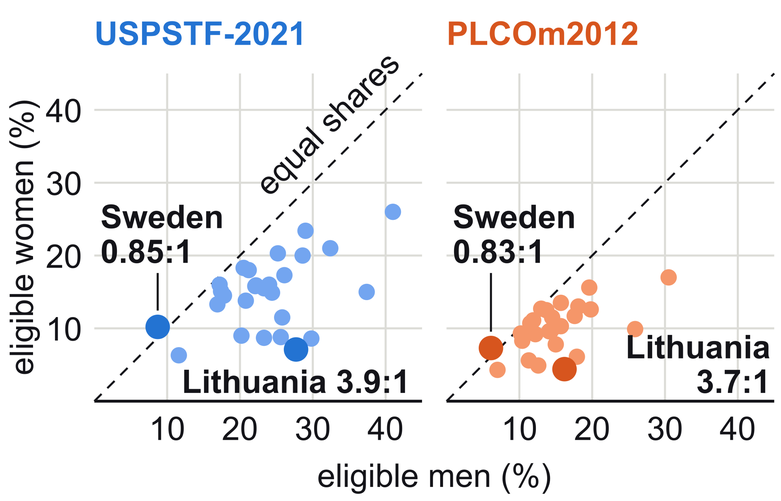
Millions eligible, EU-27



Below bars: former smokers as % of eligible

By sex

Eligible share, 2025



Implications

Screening needs long-term capacity

In 2040 the EU still has 22 million people eligible under USPSTF-2021 and 16 million under PLCOm2012. CT capacity, radiologists and follow-up care must be planned for decades.

Current smoking cannot size a programme

Spain and Slovakia both have 21% current smokers, yet eligibility is 20% against 14% under USPSTF-2021 and 12% against 8% under PLCOm2012. Each state needs its own estimate from lifetime smoking histories.

Invitations must reach people who quit

Former smokers are 24% (USPSTF-2021) and 23% (PLCOm2012) of the eligible today, and 31% under both by 2040. Stop-smoking services miss them, and health records rarely hold quit dates or pack-years.

Member States can scope their own eligible population, under either criterion, at the EU-SHG dashboard.

Scan to open the EU-SHG dashboard.

Contact
Alexander Dietz
a.dietz.1@erasmusmc.nl

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