EU CanScreen
European Joint Action on Cancer Screening

Modelling cost-effectiveness and prioritisation

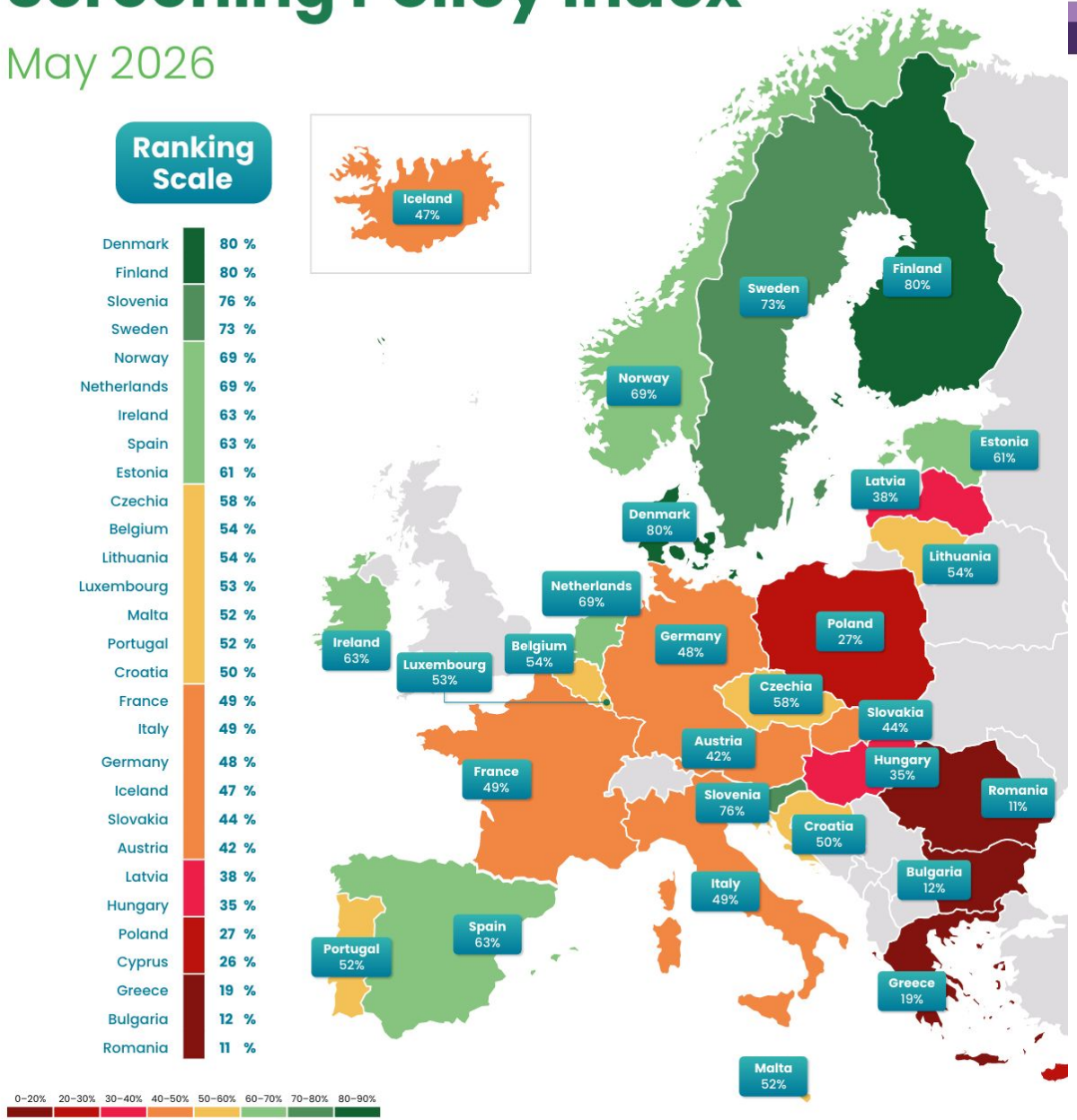
Erasmus MC
University Medical Center Rotterdam

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Deputy Head department of Public Health, Erasmus MC, Rotterdam, The Netherlands

Co-funded by the European Union

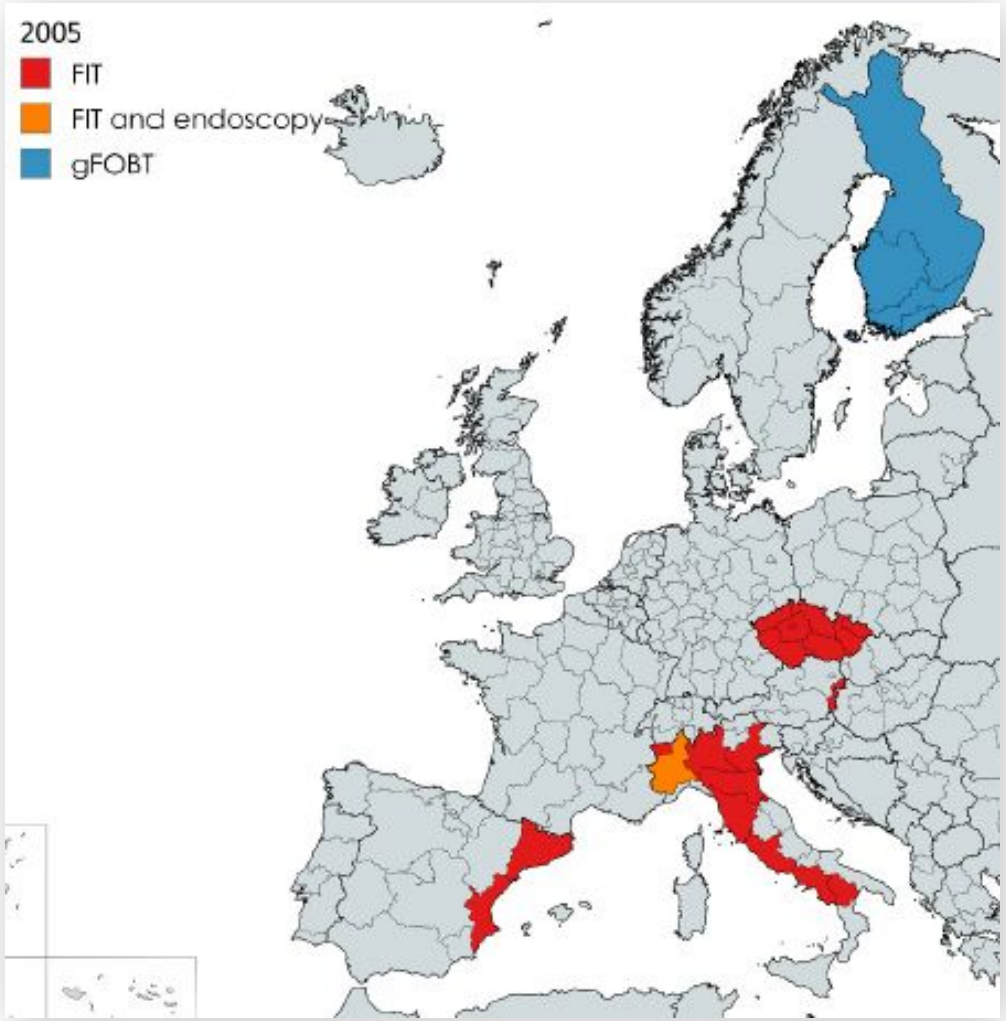
European Cancer Screening Policy Index

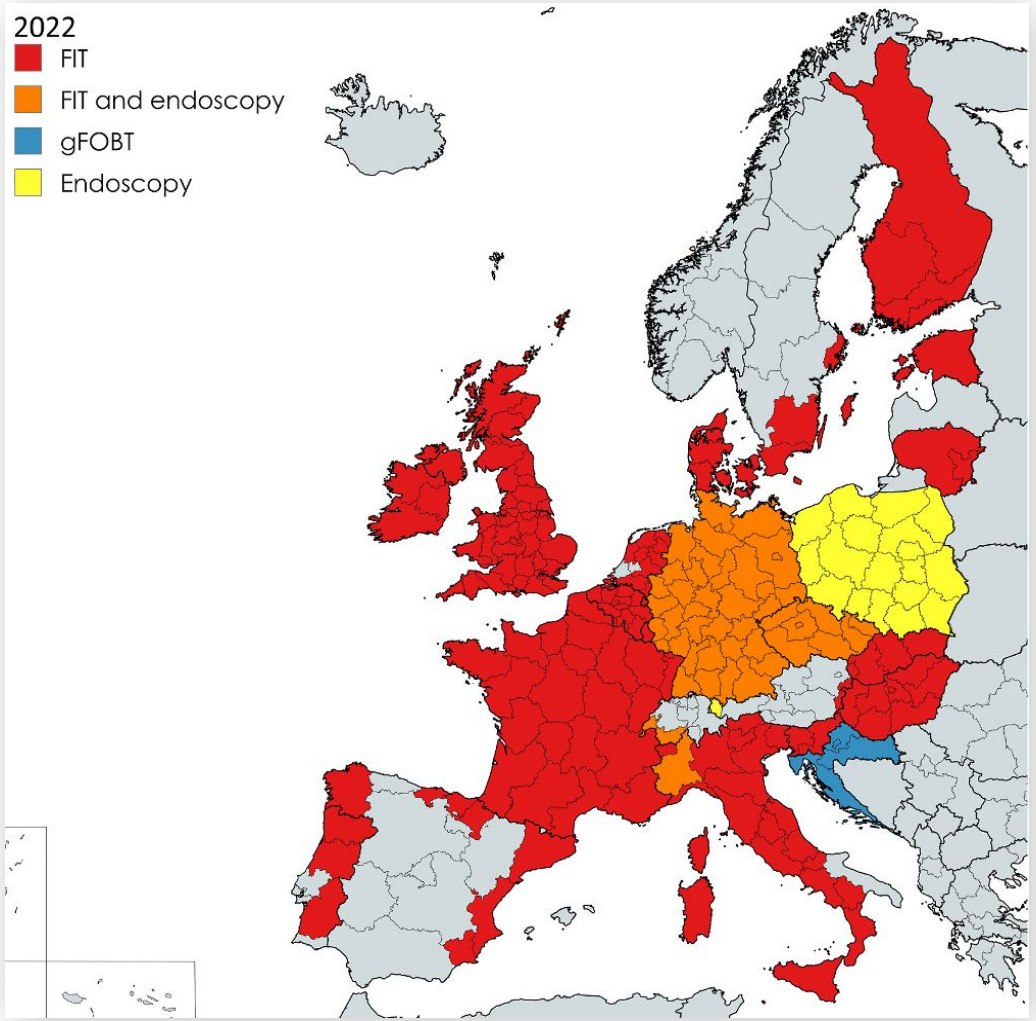
May 2026



EU Member States are not at the same pace with cancer screening

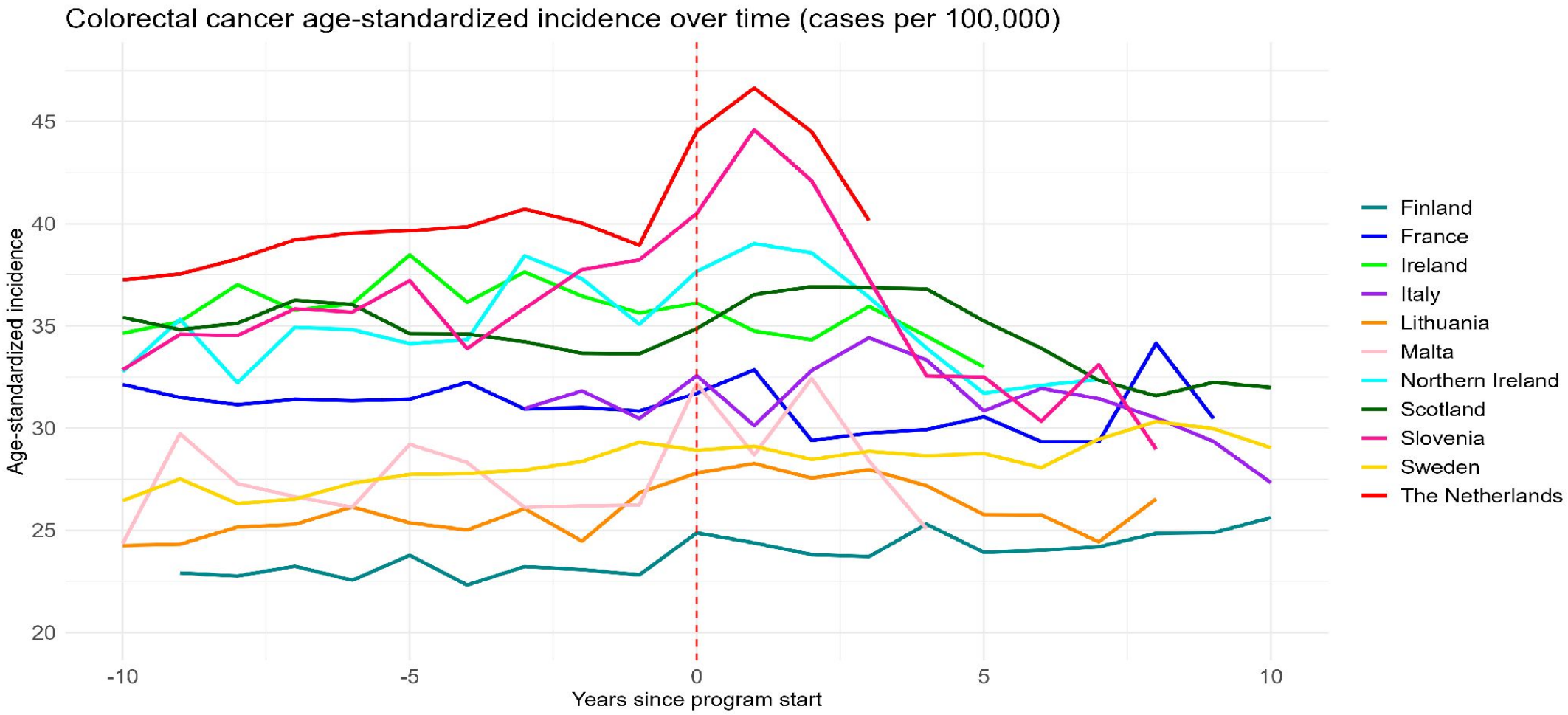
Diffusion of CRC population-based screening Europe





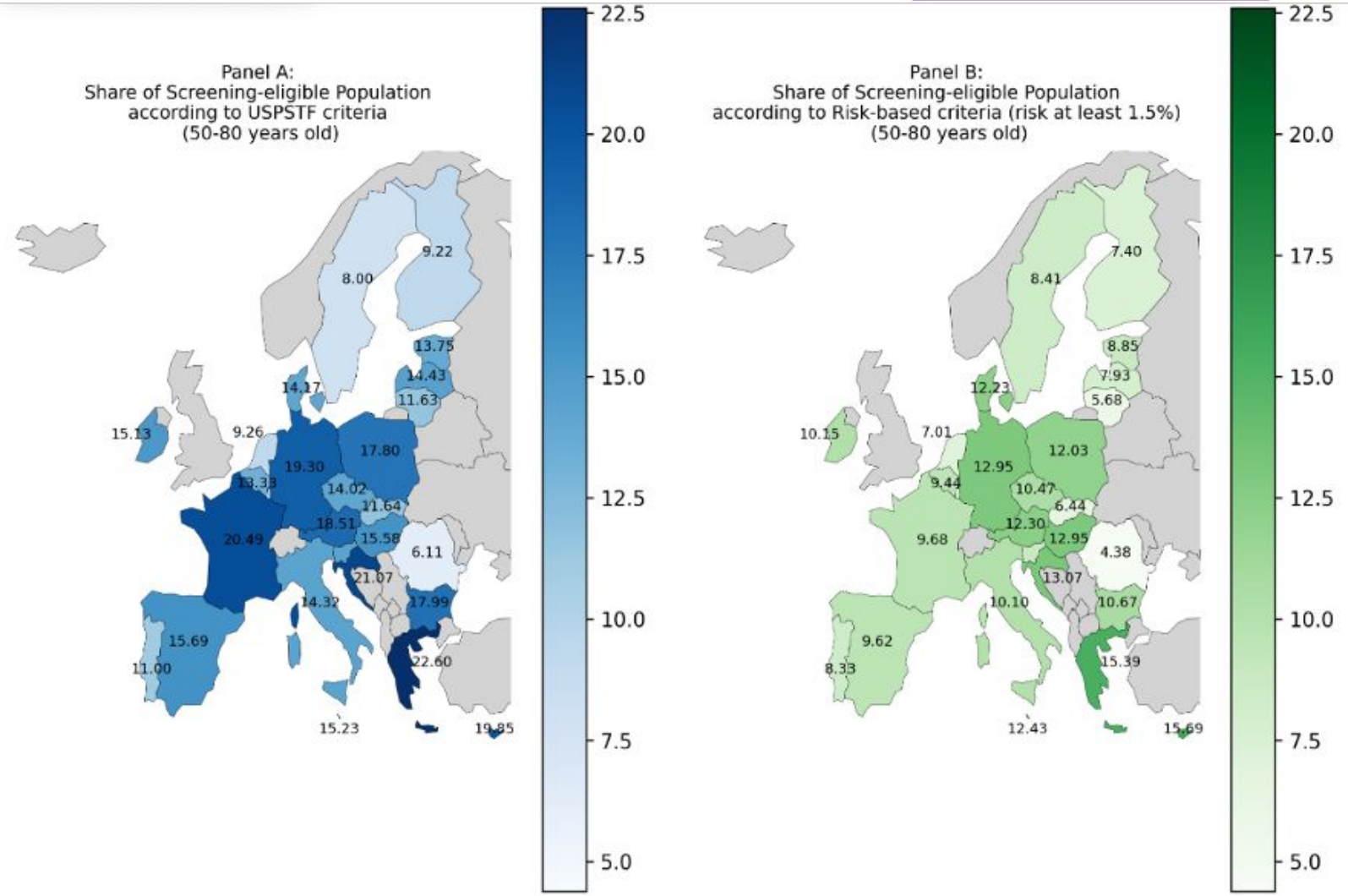
Carbotti et al., 2026 Best Practice & Research Clinical Gastroenterology

CRC incidence, ten years before and ten years after establishment of screening



Carbotti et al, 2026 Best Practice & Research Clinical Gastroenterology

Estimating the size of lung-cancer-screening-eligible population in the EU



*Proportions for France were obtained from Eurobarometer (2017)
**Data for Years of Smoking for the Netherlands were obtained from the Dutch health survey (Gezondheidsenquete, year 2019)

Estimated eligible population:

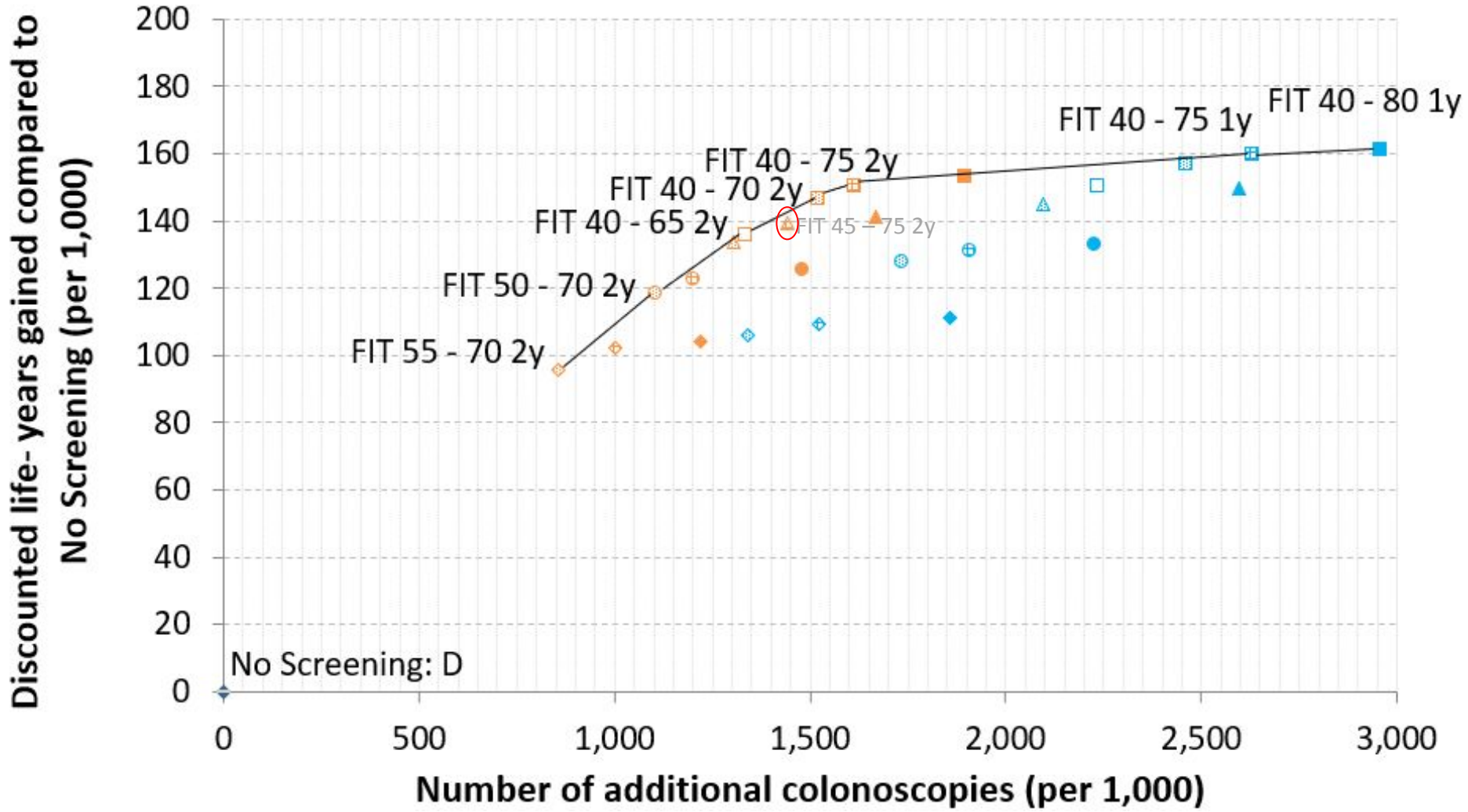
- USPTSF criteria: 25 million
- Risk-based criteria: 16 million individuals

Bartekova et al., in revision

Tasks

10.1	Adapting cervical cancer screening programs to HPV vaccinated birth cohorts
10.2	Estimation of benefits, harms, and resource requirements of current screening and impact of barriers and facilitators
10.3	Estimation of benefits, harms, and resource requirements to implement new screening approaches
10.4	Comparison of benefits, harms, and resource requirements across screening programs to prioritize screening interventions
10.5	Assessment of new technologies and approaches in cancer screening
10.6	Estimation of benefits, harms, and resource requirements of risk-based screening approaches
10.7	Medico-economical modelling and cost effectiveness of multicancer early detection tests

Cost-effectiveness analyses

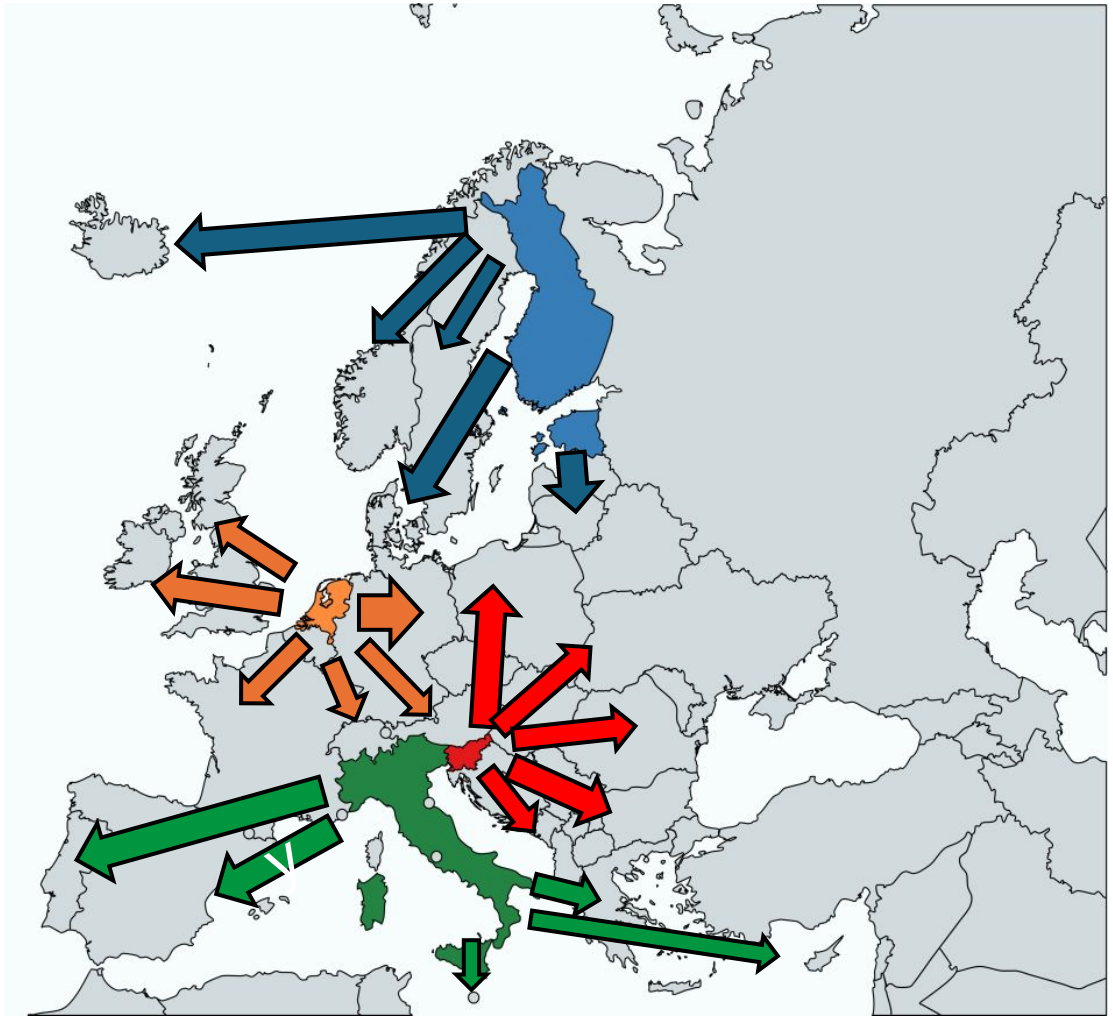


Model calibration

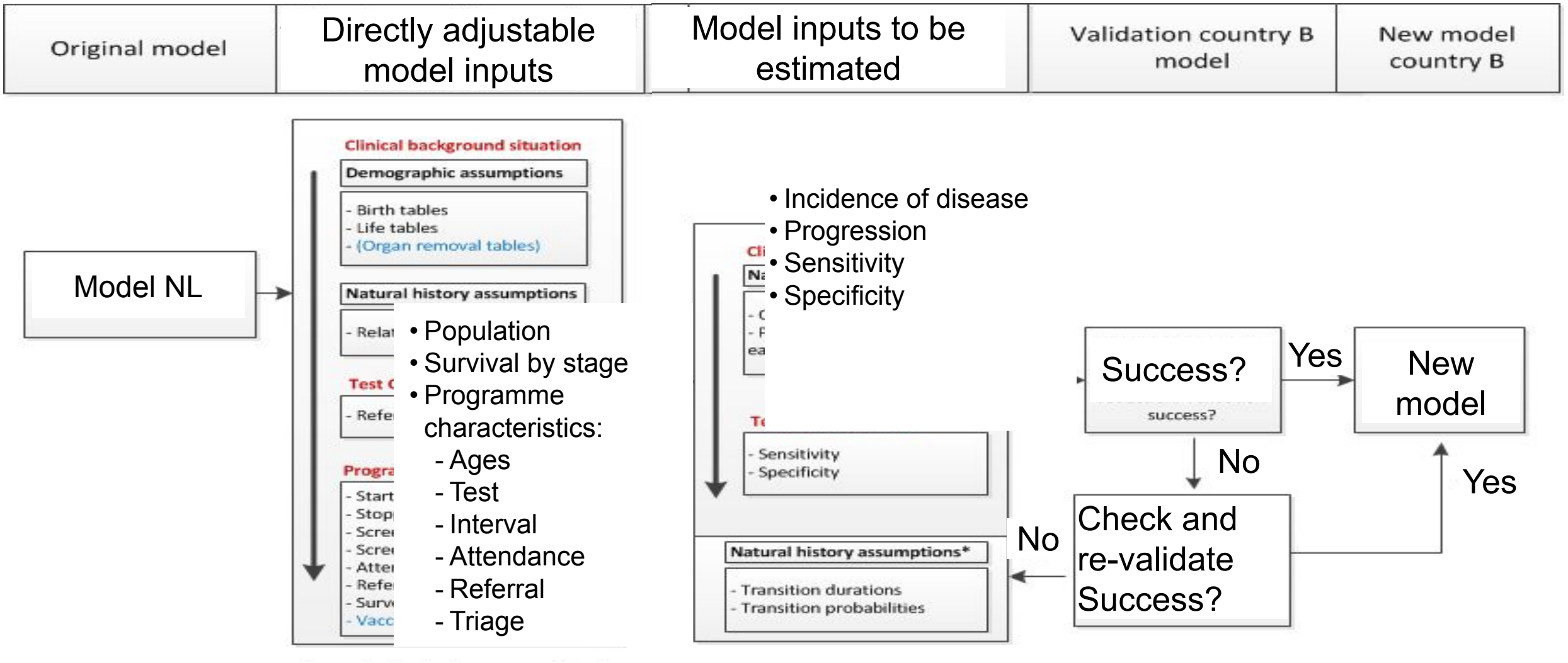
One model version



Country-specific models



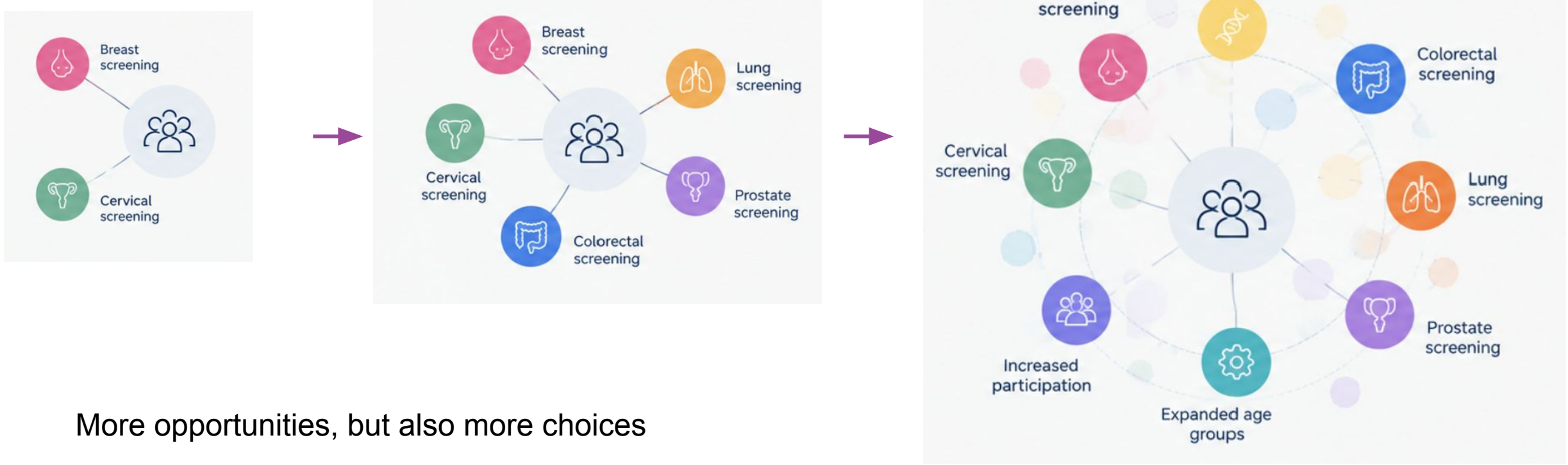
Model calibration



Progress model calibration

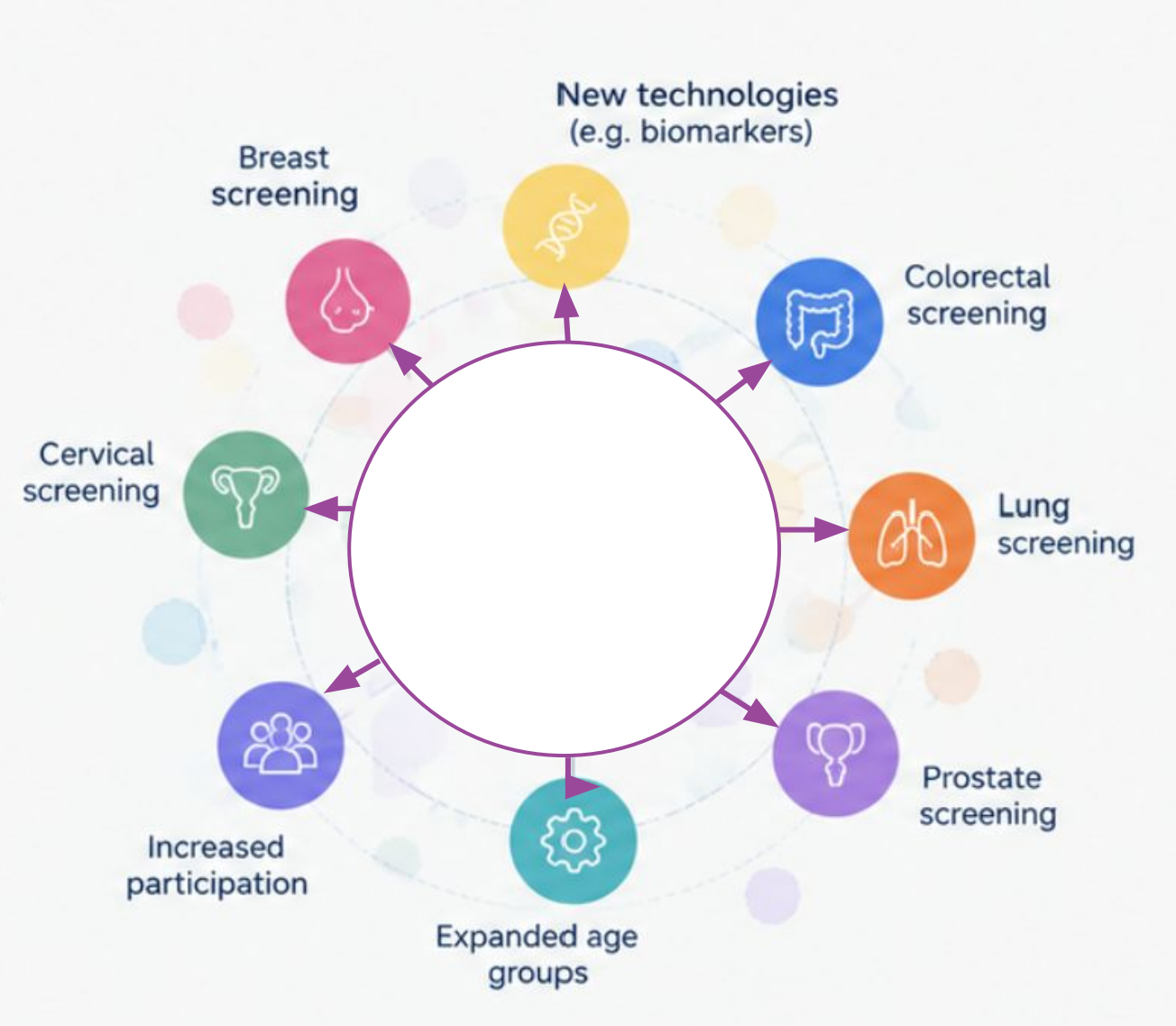
Breast	Cervical	Colorectal	Lung	Prostate	Gastric
Slovenia	Slovenia	Slovenia	The Netherlands	Finland	The Netherlands
The Netherlands	The Netherlands	The Netherlands	Hungary	The Netherlands	Slovenia
Ukraine	Ukraine	Ukraine	Latvia	Latvia	Latvia
Slovakia	Slovakia	Slovakia	Slovenia	Slovenia	Ukraine
Estonia	Estonia	Estonia	Finland	Spain	Portugal
Hungary	Hungary	Hungary			

More opportunities to detect cancer earlier



More opportunities, but also more choices

We cannot do everything (at once)



Beyond cost-effectiveness

Equity

Safety

Sustainability of the program

need of intervention

Benefits and clinical effectiveness

Severity

Impact on environment

Harms

Economic impact

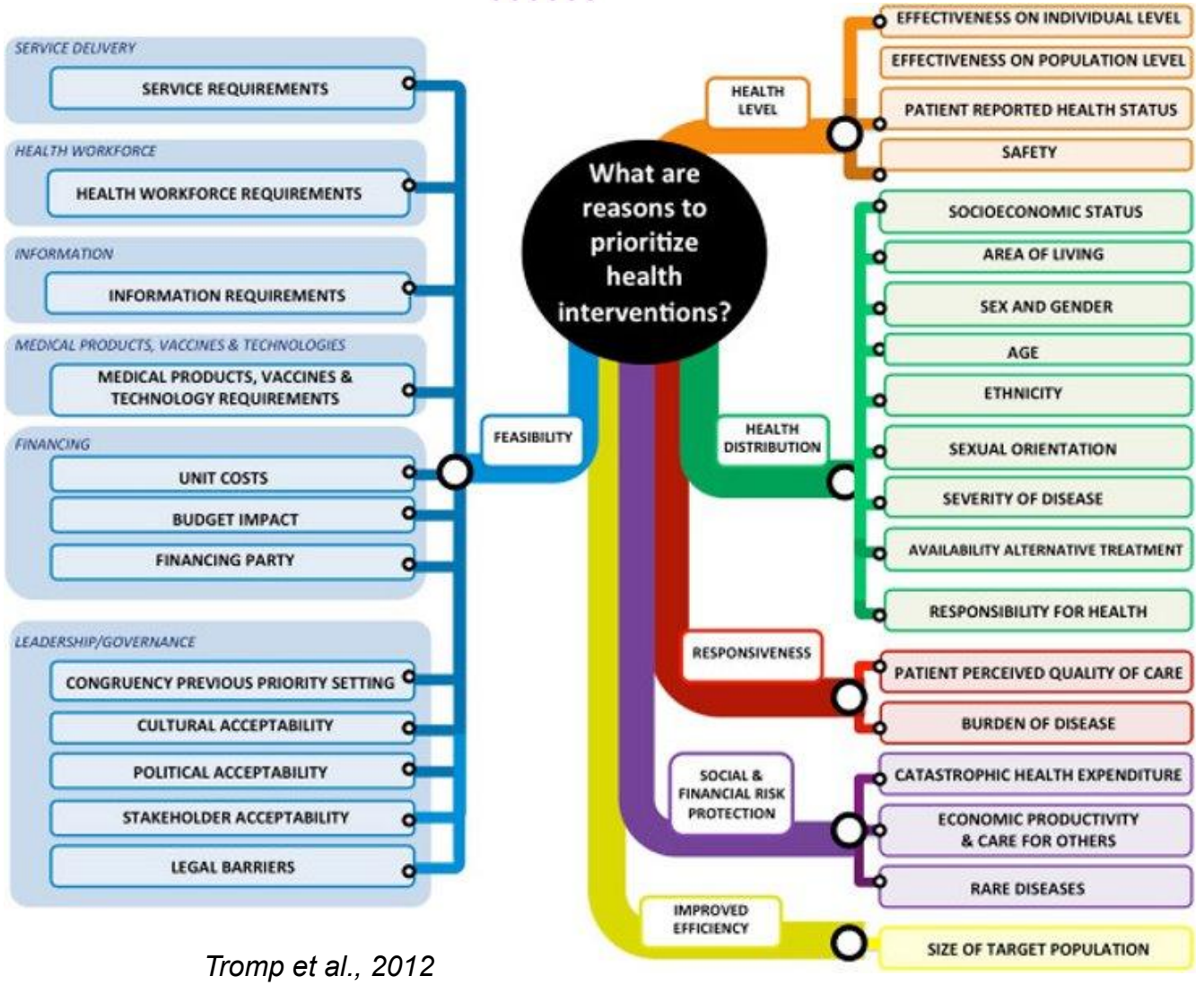
Acceptability



Scoping review CPO

What is important to reach decisions about prioritisation?

- Mapped by a scoping review on frameworks and tools developed for prioritisation of public health interventions
- 66 selected papers -> 7 specifically focused on cancer screening programs
- Wide range of prioritisation tools
- Limited number of clearly defined frameworks, most of them being limited in scope



Tromp et al., 2012

Domains

1. Benefits and clinical effectiveness
2. Safety and harms
3. Severity of the problem and need for intervention
4. Efficiency and economic impact
5. Sustainability of the program
6. Equity and fairness
7. Acceptability
8. Societal and strategic considerations



Prioritisation framework

- CPO and Erasmus MC worked on a new framework for prioritizing cancer screening strategies

- Example: should I (now/first/ever) Implement lung cancer screening or extend the targeted age range for breast cancer screening?

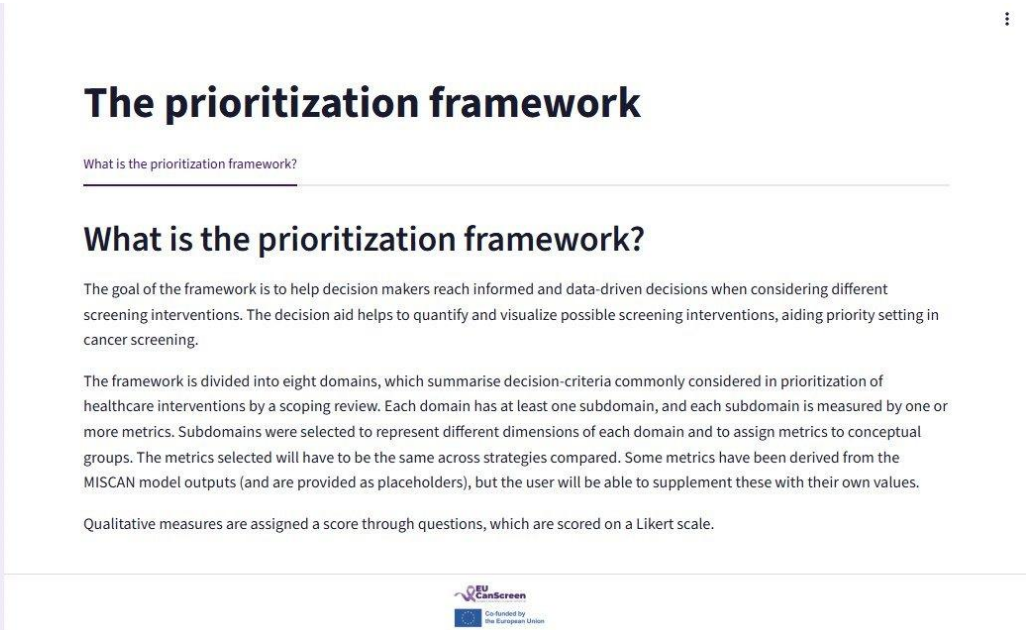
- What do I consider when making this choice?



The decision aid

- Interactive tool based on the prioritisation framework that collects and synthesises data for all selected strategies
- Tool aids the user in choosing which strategy to implement, touching upon quantitative and qualitative aspects of each strategy
- The data for each strategy is partly derived from modelling outputs, and partly from user inputs
- Synthesis of modelling, ethical and practical concerns





The decision aid - inputs

- User of the decision aid defines the strategies that he/she wants to compare

  For example:
  1. Implement a new screening program (lung cancer)
  2. Extend screening age for breast cancer
  3. Extend screening age for colorectal cancer



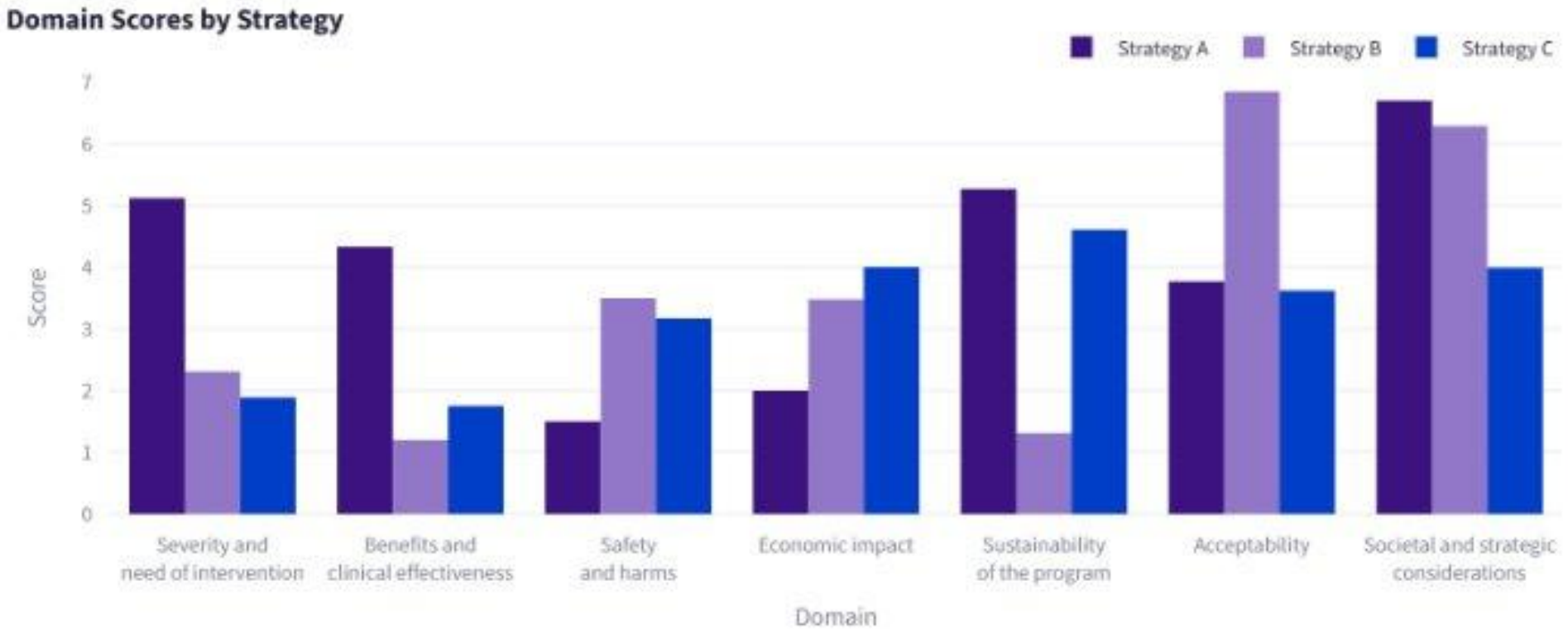
- Each domain consists of a set of metrics that enables its quantification
  - Metrics can be both quantitative and qualitative

The decision aid - inputs

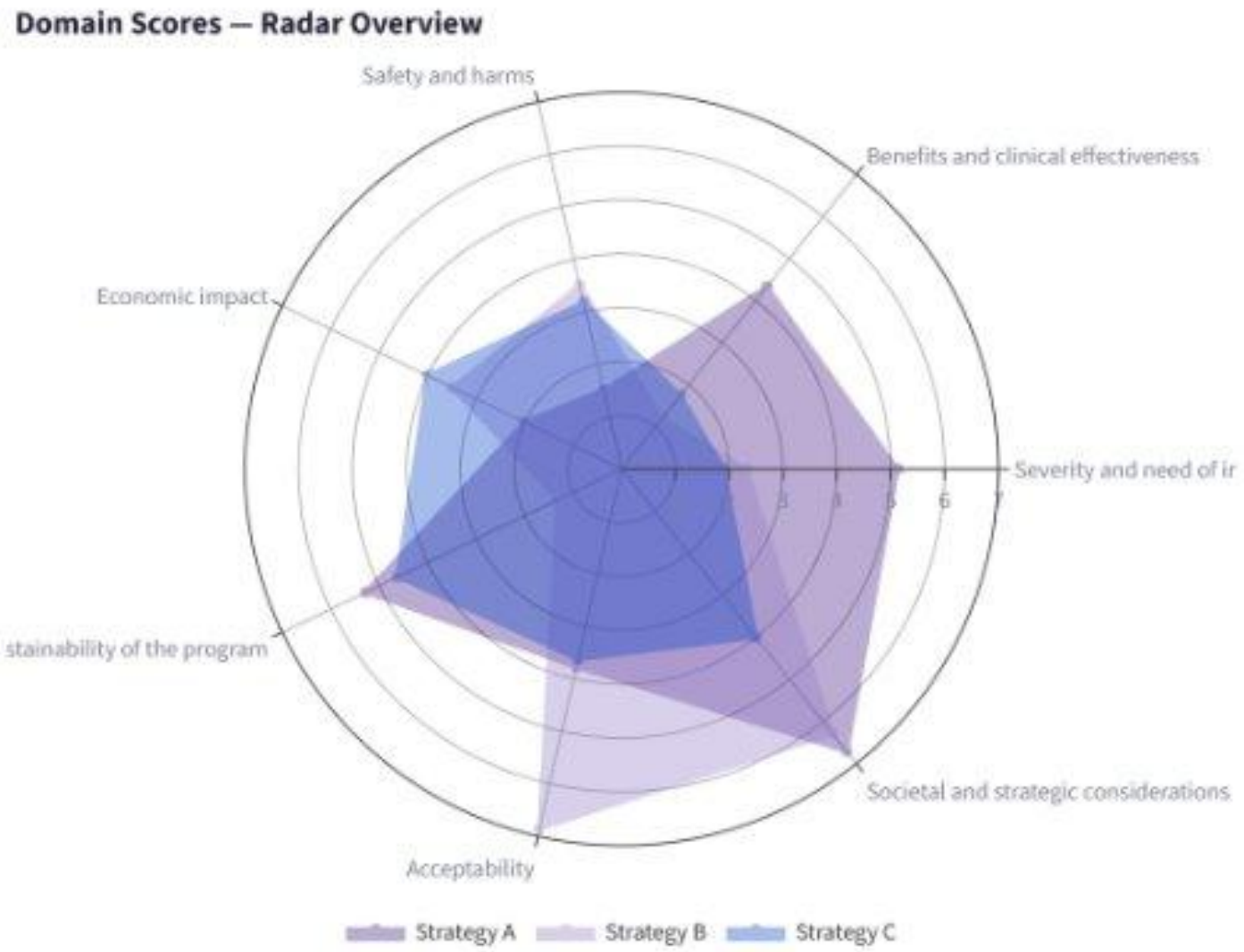
Domain	Sub-domains	Metrics	Strategy 1 (lung)	Strategy 2 (breast)	Strategy 3 (colorectal)
1. BENEFITS AND CLINICAL EFFECTIVENESS	Life extension	Life Years Gained (LYG)	41.2	6	2
		Improvement in mortality	4.3	0.5	1
		Improvement in incidence	0	0	3
		(min two metrics required)			
	Quality-of-life improvement	QALYs gained	34.2	6	4

The decision aid - output

- For all strategies considered the tool outputs a score for each of the priorization domains



using the decision aid



Scenarios of interest for target countries

Colorectal cancer screening

- Higher participation rates (e.g. through different distribution of kit test)
- Lowering starting age / extending stopping age
- Risk-based approach based on hemoglobin levels

Cervical cancer screening

- Self-sampling
- Full genotyping
- Vaccination effects

Breast cancer screening

- Biennial screening 50-74 years old
- Lowering starting age of screening

Prostate cancer screening

- Age intervals of high interest: 50-75, 50-70, 40-75, 45-75
- Screening intensity: every year, every 2 years and every 5 years
- Potential change in PSA threshold
- Incorporation of MRI

Lung cancer screening

- Possibility to integrate results from pilots (WP8)
- Positivity, efficacy and cost of smoking cessation intervention

Gastric cancer screening

- Combination with CRC screening
- Combinations of target age and test



Bijschrift

- Which one ?

In progress….

Erasmus MC:

- Giulia Carbotti
- Katarina Bartekova
- Danica van den Berg
- Koen de Nijs
- Eveline Heijnsdijk
- Iris Lansdorp-Vogelaar
- Harry de Koning

CPO:

- Carlo Senore
- Elisa Camussi
- Cristiano Piccinelli

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EU CanScreen
European Joint Action on Cancer Screening

Name SURNAME
Contact Details



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Current status

- A draft version of the prioritisation framework has been presented
  - during the WP4 kick-off meeting in Bled (March 2026)
  - during the MediCASE cost-action training course in Turin (July 2026)

- Plan for testing the tool in the context of the TSM are ongoing



The decision aid - inputs

TRAINING	**Staffing levels and competencies are adequate to deliver goals (including QA).**	Organizational capacity	Major staffing gaps; goals unattainable.	Some staff but insufficient skills/coverage.	Adequate in parts; gaps in key roles (QA, data, navigation).	Adequate staffing and competencies with training and backup coverage.	Strong staffing resilience: succession plans, cross-training, retention, and surge capacity for peaks.
	To what extent would additional training be required for existing professionals?		Extensive (long-term or highly specialized training)	Moderate (structured training, limited duration)	Minimal (short refresher or update)	None (no additional training is requested)	
	Training needs are assessed regularly (by role and site) using data (QA findings, errors, performance gaps).	Capacity building & training planning	No training needs assessment.	Informal or one-off assessment only.	Occasional assessments but not linked to training plans.	Routine needs assessment linked to training plans and priorities.	Continuous, data-driven needs assessment that demonstrably closes performance gaps.