Challenges for screening and early detection in Europe

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SCOPE

- This presentation is based on tasks on Early detection and cancer screening in the Cancer prevention Work Package (WP5) of the earlier iPAAC Joint Action (https://www.ipaac.eu/). The WP5 aimed to support Member States to foster cancer prevention by strengthening health in all policies, implementing population-based screening and addressing barriers to early detection

- Work on early detection of cancer focused on two approaches (WHO 2017): *i. Cancer screening programmes*; and *ii. Early diagnosis of symptomatic cancer* in patient – diagnosis and management based on indication in patient-level or programmatic services

- Policy-making perspectives, criteria and organization vary greatly between the different modalities of early detection!

EARLY DETECTION MODALITIES

- **Population screening** as a public health measure: use of relatively simple medical tests across an apparently healthy population to identify individuals who have an unrecognized disease (Wilson & Jungner, 1968). Persons with a positive or suspicious finding must be referred to diagnostic confirmation and management

- **Early diagnosis** of cancer: focus in people with symptoms and signs consistent with cancer, or in intensified surveillance and counseling of particular high-risk groups (WHO, 2017). Probability of cancer is usually high compared with population screening. Surveillance may concern a spectrum of diseases

- A targeted, **population-based health-check programme** piloting lung health checks with CT imaging (https://www.cancerresearchuk.org/about-cancer/lung-cancer/getting-diagnosed/screening). Such a programme can target interventions for several disease outcomes, as well as have links with prevention programmes to stop smoking

Risk-stratified cancer screening

- Risk-stratified screening (selective screening in a population-based approach, Wilson & Jungner, 1968) aims to improve the screening programme by modifying screening policies within a population-based programme based on individual-level disease risk. Risk-stratified screening is an example of innovation and development, with no generic criteria developed yet
  - Certain conceptual differences remain between surveillance and risk-adjusted population-based screening

Colorectal cancer: Examples of screening, vs some surveillance strategies of high-risk groups (IARC, 2019)

Testing modality and indication	Test method	Target age	Interval	Evaluation of information on benefits outweigh the harm
SCREENING STRATEGIES				
	Faecal blood	50−70	1 or 2 years	Sufficient
	FS	50−70	Single screen	Sufficient
	Colonoscopy	50−70	Single screen	Sufficient/limited
	Computed tomography colonography	50−70	Single screen	Limited/inadequate
SURVEILLANCE STRATEGIES				
Lynch syndrome*	Colonoscopy	Age 20−25 onwards	1−2 years	Not available
Classic familial adenomatous polyposis*	Sigmoidoscopy or colonoscopy	Age 11 onwards	1 year	Not available
Attenuated familial adenomatous polyposis*	Colonoscopy	Age 20 onwards	2 years	Not available
Family history of colorectal neoplasia	Colonoscopy	Variable	Variable	Not available
Personal history of colorectal neoplasia	Colonoscopy	Variable	Variable	Not available (trials on-going)
Medical conditions	Colonoscopy	Variable	Variable	Not available

* Examples of high-risk groups by genetic predisposition

The unique, critical criteria for cancer screening

- In population-based screening the evidence on **an acceptable balance between benefit and harm** is of key importance. Screening can turn an apparently healthy individual to a cancer patient. Yet, deaths caused by the screened disease comprise just a proportion of all deaths in the targeted population

  - Evidence base prior starting: cause-specific mortality from randomized trials; benefits demonstrated to outweigh the harms; resources available and screening demonstrated cost-effective

  - Planning, piloting, implementing, modifying, stopping: stepwise implementation with integrated monitoring and evaluation; informed choices; optimizing starting and stopping age groups; tackling social inequalities; continuous quality improvement

    - ✓ Quality manual & indicators adopted; screening modification and even stopping rules defined
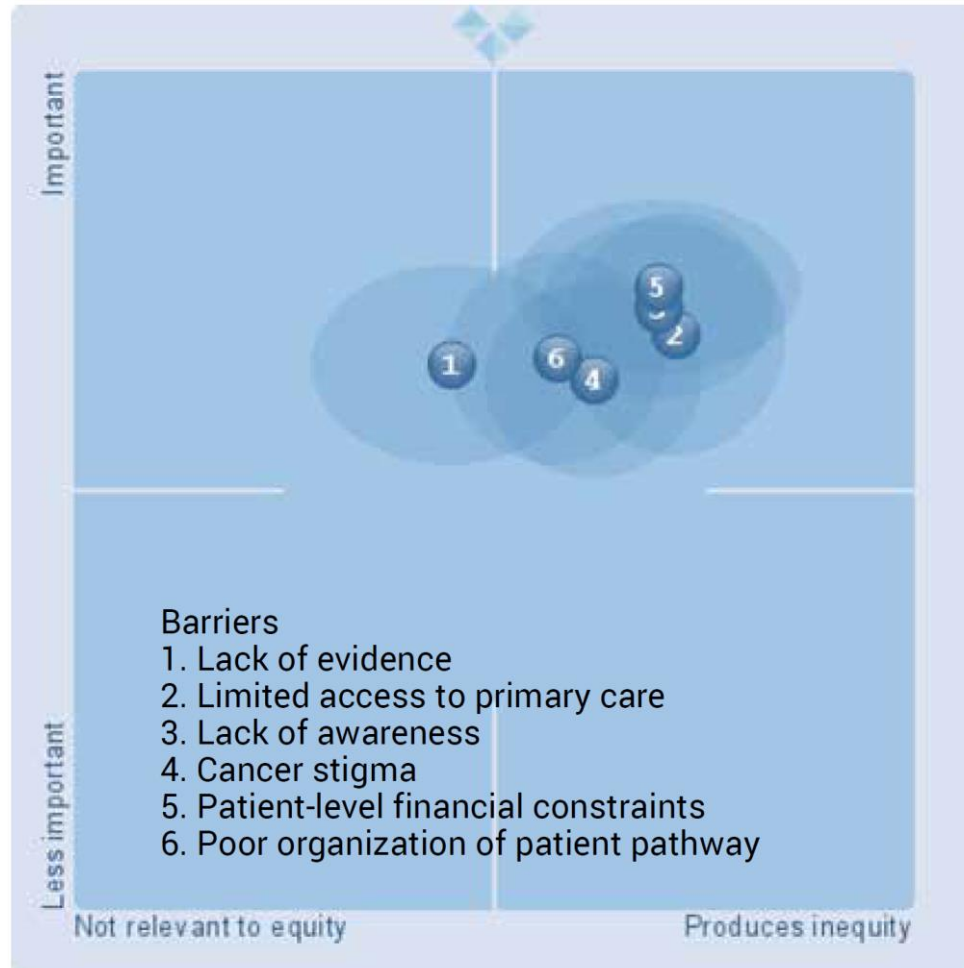
Examples of current topics in risk-stratified screening

- Modify cervical cancer screening in HPV vaccinated birth cohorts (vs unvaccinated)
  - Testing HPV 16 & 18 types in vaccinated birth cohorts – may provide better balance of benefit/harm in young women than cytology or hrHPV with 13 types

- Stratify colorectal cancer screening with help of family history of cancer, lifestyle, environmental and genetic factors and screening history

- Improve breast cancer screening in women with high breast density
  - Imaging with limited validity. Molecular markers (e.g. tumor associated antigens/autoantigens, or miRNA in blood or plasma), with AI screening mammography, probably need to be studied

- Genetic susceptibility (polymorphisms) to breast cancer and breast cancer screening
  — Genetic predisposition to very high breast cancer risk (BRCA1 or 2) may be subject to particular surveillance programme in the clinical setting -- separate from population-based cancer screening

Assessed early diagnosis services, iPAAC D5.1.

- Early diagnosis of **skin cancers** based on inspection and surveillance of alterations of moles, and campaigns on UV protection

- Dental and primary health care services on recognizing **oral cancers and precancers** early

- Awareness and access to services based on **symptoms or signs for *breast, prostate and other (e.g., colon, rectum, pancreas, gastric, cervix, thyroid) cancers*** - with specific challenges for the different cancer sites

Perceived barriers for early diagnosis of ORAL CANCERS by iPAAC partners and focal respondents (Source: iPAAC D5.1.)

Barriers
1. Lack of evidence
2. Limited access to primary care
3. Lack of awareness
4. Cancer stigma
5. Patient-level financial constraints
6. Poor organization of patient pathway

The scores of barriers are based on the survey Less important to important (0-100) and Not relevant to equity to produces inequity (0-100).

Barriers of early detection grouped by importance	
Patient-level financial constraints	74
Lack of awareness	72
Limited access to primary care	68
Poor organization of patient pathway	66
Lack of evidence	65
Cancer stigma	63

Barriers of early detection grouped by order of producing inequity	
Limited access to primary care	72
Lack of awareness	70
Patient-level financial constraints	70
Cancer stigma	62
Poor organization of patient pathway	58
Lack of evidence	45

Suggested policy responses to the barriers perceived in early diagnosis (Source: iPAAC D5.1.)
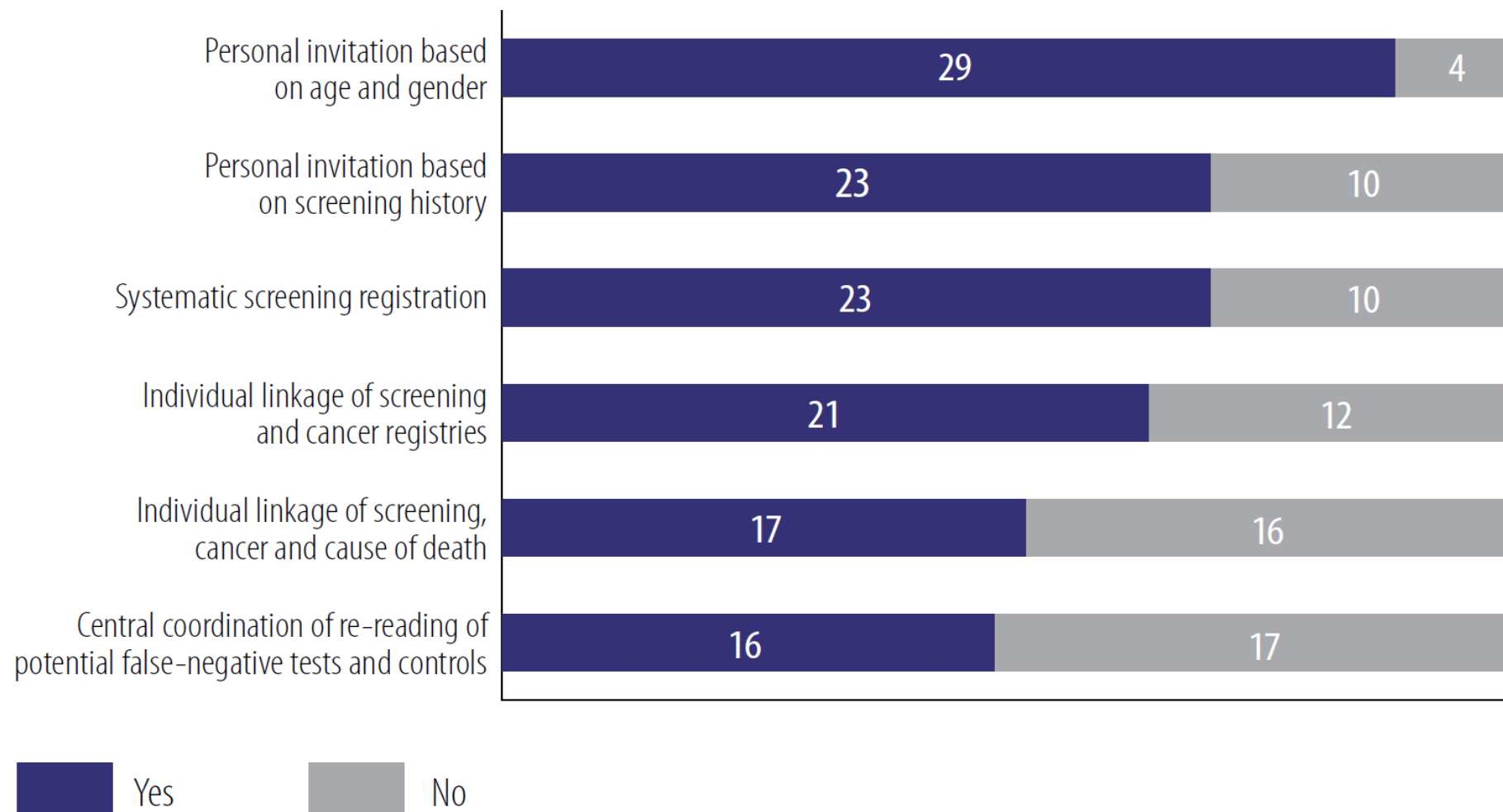
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- Important to identify barriers that induce inequalities. Oral and skin cancers were perceived to have largest delays in detection due to inequalities. In breast cancer access to primary care and poor organization of patient pathway affects inequality. High risk groups and vulnerable populations need tailored approaches

- Evidence for early diagnosis and treatment requires well planned piloting, systematic data management, monitoring, evaluation and examining harms and benefits throughout the management history. Lack of evidence was the most serious barrier in four cancer types chosen for the survey (breast, prostate, oral and skin cancers), these could be candidates for pilots

- Informing people of early cancer signs is very valid. Health literacy and plain language communication in focus

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Bottlenecks in implementing effective cancer screening programmes?

Challenges in cancer screening in the EU

- Out of the 28 Member States (2017) population-based screening in its implementation, roll-out, piloting or planning phase on-going for
  - Breast cancer in 25, cervical cancer in 22, and colorectal cancer 20 Member States
    Ponti et al, 2017 and subsequent EUSR reports

- There are still remarkable problems and barriers in many programmes
  - Sub-optimal attendance and coverage, and inequalities in attendance by and within MSs (*ibid., Molina et al., 2016, Peiro et al., 2017*)
  - Lack of systematic monitoring and evaluation (*Ponti et al., 2017 & EUSR reports*)
  - Lack of appropriate governance and legal frameworks to support evidence-based implementation and systematic quality assurance (*Lönnberg et al., 2017; Majek et al., 2018*)

# Legal frameworks for cervical cancer screening for 33 EU or EFTA countries (Majek et al., EJPH 2018)

Legal framework	Yes	No
Personal invitation based on age and gender	29	4
Personal invitation based on screening history	23	10
Systematic screening registration	23	10
Individual linkage of screening and cancer registries	21	12
Individual linkage of screening, cancer and cause of death	17	16
Central coordination of re-reading of potential false-negative tests and controls	16	17

Cancer Screening in the EU – Exam Coverage in 2013/14
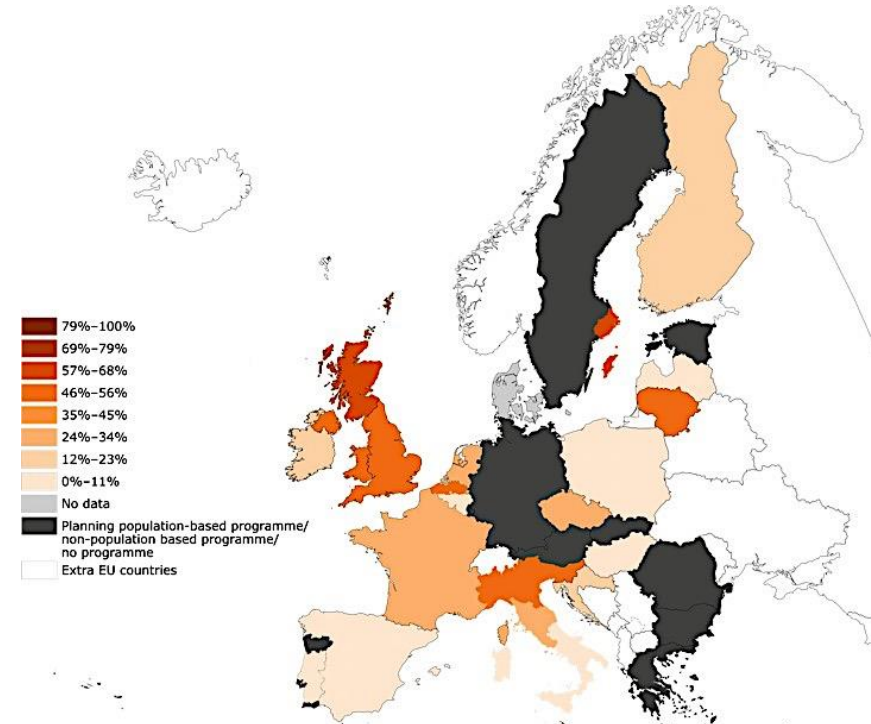## Source: Antonio Ponti et al. 2017; Partha Basu 14.1.2021
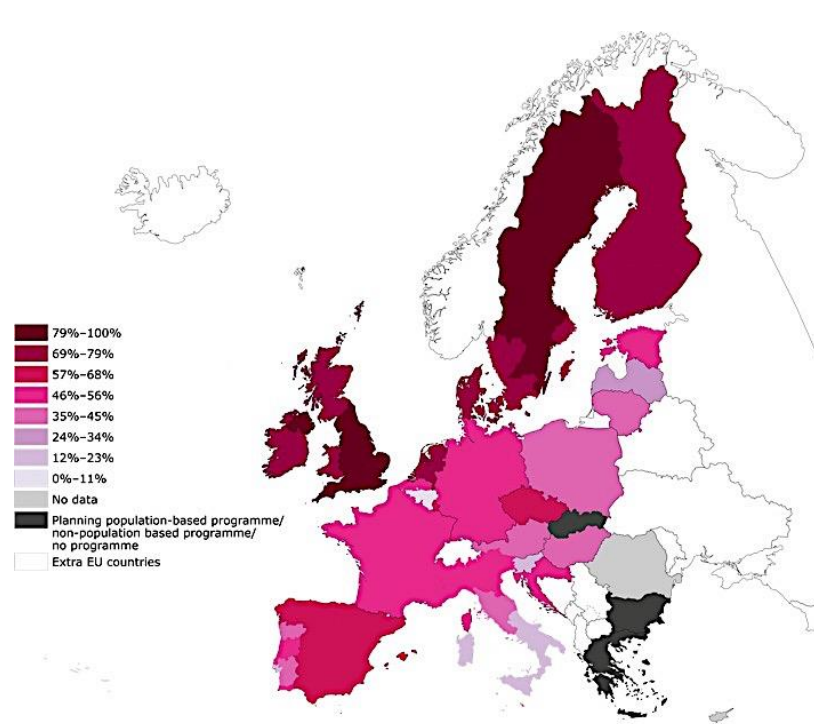
Breast ca screening (50-69 y)

Average: 49%
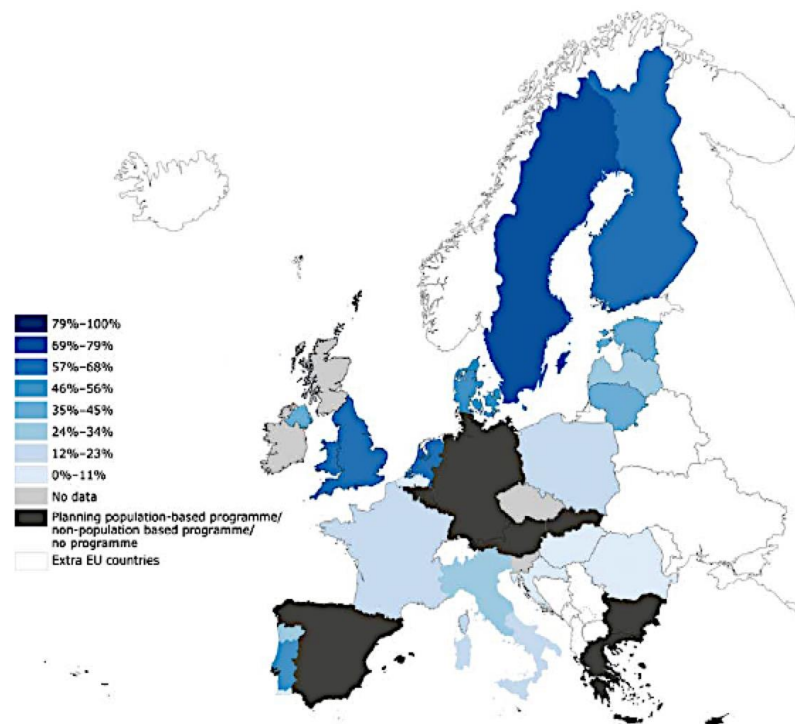
Cervix ca screening (program age)

Average: 30%

CRC screening (program age)

Average: 14%

https://screening.iarc.fr/EUreport.php

CERVICAL CANCER SCREENING VS TESTING:

Cervical Cancer Mortality Estimate ≥6.0/100,000 ASR (World) (GLOBOCAN 2020)
Cervical Cancer Mortality Estimate 4.0-5.9/100,000 ASR (World) (GLOBOCAN 2020)

	EHIS 2014, tested %	EHIS 2019, tested %	Programme monitoring, coverage %, Ponti et al. 2017
Austria	86.6	85.0	No data
Belgium	75.4	69.6	No data
Bulgaria	**52.2**	**66.8**	**No data**
Croatia	76.9	76.1	11
Cyprus	64.6	73.8	No data
Czech Republ	87.3	91.7	49
Denmark	63.5	67.1	82
Estonia	**57.7**	**60.5**	**44**
Finland	79.8	85.6	66
France	81.9	76.3	65
Germany	80.3	77.9	No data
Greece	75.6	81.6	No data
Hungary	**70.6**	**74.5**	**51**
Ireland	68.4	69.7	80

	EHIS 2014, tested %	EHIS 2019, tested %	Programme monitoring, coverage %, Ponti et al. 2017
Italy	69.9	71.7	31
Latvia	**78.4**	**79.1**	**26**
Lithuania	**61.9**	**69.2**	**48**
Luxembourg	83.6	85.6	No data
Malta	62.2	66.4	No data
Netherlands	48.8	48.1	63
Poland	**71.6**	**74.3**	**21**
Portugal	71.1	69.5	No data
Romania	**26.9**	**38.9**	**9**
Slovakia	**69.0**	**73.4**	**No data**
Slovenia	77.4	78.9	77
Spain	69.0	71.4	No data
Sweden	80.1	91.7	86
UK	62.8	No data	63

EHIS data source: https://ec.europa.eu/eurostat/web/health/data/database; Programme monitoring data source: Ponti et al., 2017

Key conclusions iPAAC task on cancer screening

- Focus on binding solutions for better coverage, legal frameworks, governance structures and standardized data at the pan-European level

- ➤ Quality improvement through regular screening monitoring data using standardized tools, protocols and outputs at the European level on a continuous basis. This includes developing acceptable standards for the core indicators

Priority list for cancer screening in Europe

1. **Quality assurance**
Solutions for better coverage of services, legal frameworks, governance and standardized data, minimizing consequences of Covid-19

2. **Solving disparities**
HPV vaccination and cancer screening coverage

3. Controlled modifications
Gradual, well-controlled risk- stratified modifications with evaluation of effectiveness

4. Updates
Social and health inequalities, and risk-stratified screening in the European screening recommendations and quality assurance guidelines

5. Implementation
Programme to training and capacity-building for cancer screening and early detection. Professional networks

6. Comprehensiveness
Better integration between primary and secondary preventive strategies

7. New programmes
Updating evidence-base. In addition to harms and benefits, economic and resource assessments are needed, given the huge variation within EU regions

Thank you for your attention!