iPAAC
INNOVATIVE PARTNERSHIP
FOR ACTION AGAINST CANCER

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Early detection of cancer

Policy Brief

Policy brief to advance policy options
for early detection strategies in Europe, iPAAC WP5

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Right timing to catch cancer – key concepts

Early detection as a concept describes **two approaches that enable timely diagnosis** and treatment of cancer:

1. **early diagnosis**, that is the recognition of symptomatic cancer in patients
2. **cancer screening**, which is the identification of asymptomatic disease in an apparently healthy, or unselected, target population

It is necessary to separate two different cancer early detection strategies: i) population-based screening programmes as public health measures; and ii) intensified surveillance or counselling of particular high-risk groups. Both strategies focus on early detection or cancer prevention. Genetic approaches of early detection are topical in research. This policy brief has focus on advancing implementation of current screening programmes. In iPAAC Joint Action there is a specific work package for genomics in cancer control and care.

Benefits should outweigh harms

Early detection, when implemented well, can reduce both human suffering and healthcare costs. In common thinking, early detection has many positive effects. Because of this good image, considerations of possible harms may be overlooked. **Balance of benefits and harms** is therefore essential for any planning in early detection.

It is useful to remember, that early detection is not possible for all cancers; there are cancers that do not have early symptoms and are hard to detect early.

Early detection programmes should be comprehensive and planned well. This requires **training, capacity-building and professional networks**. Integrated prevention programmes complement well early detection. Awareness building campaigns alone seldom bring desired effect. There is an **overdiagnosis** bias that can increase social inequalities and burden health care services. Overdiagnosis means detection of such cancers or pre-cancers (or other such conditions) by early detection which would not have been otherwise detected and would not cause death, serious harm or symptoms.

Many early detection activities are not evaluated and therefore much of the activity is not reported from effectiveness point of view. This usual in early diagnosis.

In population-based screening programmes benefit-harm ratio is included in the **screening criteria** and **screening guidelines**. Many cancers do not have biological pre-clinical stage which is requirement for developing a screening test. Or the test is inaccurate in identifying aggressive cancer forms from more benign types, then causing overdiagnosis.

Possible benefits of a screening programme are:

- a reduction in disease-specific mortality or all-cause mortality
- a reduction of advanced disease and aggressive treatment
- quality- adjusted life-years (QALYs) gained.

Possible harms of screening are:

- pain and stress of the screen test and diagnosis
- false-positive tests results
- more life living with the knowledge of the disease
- false reassurance
- overdiagnosis
- overtreatment
- complications and other adverse events due to cancer treatments

Population-based screening

Population-based screening is conducted according to nationally implemented guidelines defining who should be invited, how frequently they should be screened and how any abnormalities detected should be followed up and treated. The screening programme identifies each individual to be personally invited from a population register. Adherence to national guidelines is monitored in a screening register. Population-based screening programmes generally require a high degree of organization in order to assure that the invitational activities are performed reliably and effectively and are adequately coordinated with the subsequent steps in the screening process.

Risk-stratified screening, or selective screening in a population-based approach

In risk-stratified screening, the specific screening policy regarding screening ages, intervals, tests and follow-up algorithms is based on the risk profile of a group of individuals in the population. This may include no screening for those at lowest risk and an unfavourable expected benefit-harm ratio. In risk-stratified screening it is useful to separate clinically initiated risk profiling, for example genetic testing of patients with breast cancer and their relatives for follow-up of BRCA positive status. Risk-stratified approaches have a theoretical potential to improve overall cost-effectiveness and benefit-harm ratios of population-based screening programmes.

Testing in a surveillance programme

A close and continuous observation of high-risk patient groups is identified largely from the clinical environment or close relatives of high-risk patients; e.g. patients positive for a given syndrome, clinical finding or genetic test indicating very high risk.

Three steps of early diagnosis

Step 1:
awareness of cancer symptoms and accessing care

Step 2:
clinical evaluation, diagnosis and staging

Step 3:
access to treatment, including pain relief

Source: World Health Organization (WHO). Guide to cancer early diagnosis. World Health Organization, 2017 (ISBN 978-92-4-151194-0)

Early diagnosis and its barriers

Early diagnosis of cancer is a part of comprehensive cancer control. It means recognition of symptomatic cancer with links to treatment without delays.

Early diagnosis requires that there is good awareness of early signs of cancer. Another important factor is health system and especially easy access to primary health care without delays and with affordable cost.

Early diagnosis can increase inequalities if there are unnecessary tests leading to overuse of health care services. There is only limited amount of systematic data on early diagnosis in clinical settings. Cancer types differ greatly in their early stage and progression. Carefully planned pilots of early diagnosis could be a welcomed part of research agenda in the future.

In a European level iPAAC survey (n=153) of selected cancer types and six barriers in oral cancer were shown to produce inequalities. Most important barriers were patient-level financial constraints. In skin cancer, there is still lack of awareness related to inequalities.

ORAL CANCER

SKIN CANCER

Cancer screening programmes

Cancer screening is more than just a test. It is a public health measure that needs to be monitored and evaluated.

Any modifications to an existing programme require step by step planning.

Changes in the screening programme take into account resources available, affordability and feasibility. Health economics assessment are useful to support decision-making and policy changes.

Risk-stratified screening improves the screening programme by **modifying screening** policies within a population-based programme **based on individual-level disease risk**.

Examples:

For breast cancer the risk after certain mutations or genetic alterations can become unusually high or low. Colorectal cancer screening has been proposed to be stratified by risk of the disease assessed with help of family history, lifestyle, environmental and genetic factors. For cervical cancer, individual risk assessment has been proposed to guide the screening policy. HPV vaccinations will be changing the protocols for cervical cancer.

Improving equitable access

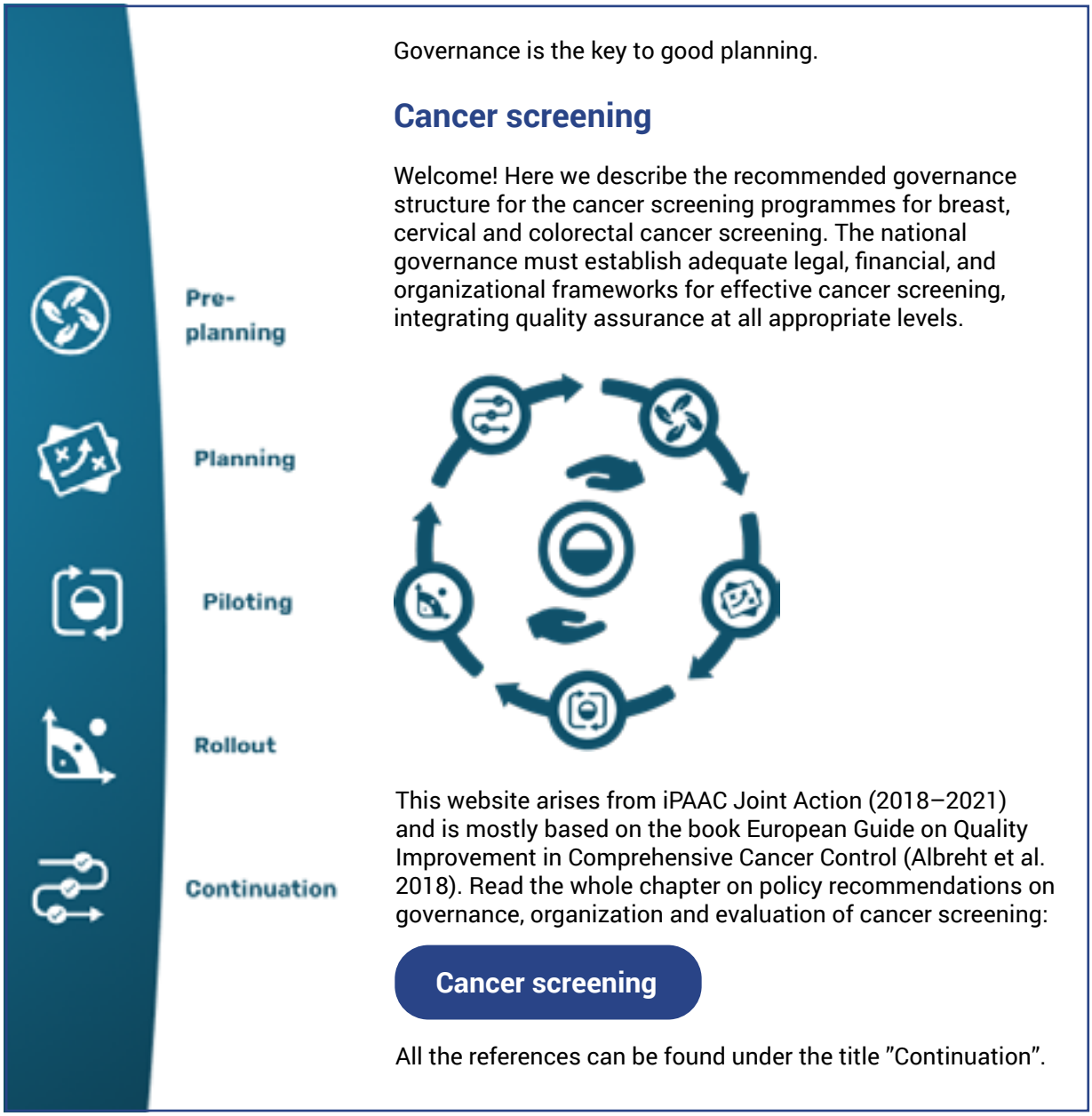
Social inequalities in cancer occur within all European countries. Rates for participation are often lower among lower socioeconomic groups, minority groups or people living in underprivileged areas. There is a wide diversity in the performance of population-based screening programmes between countries and regions.

Recommendation: Improve equitable access and compliance with cancer screening programmes.

- Provide screening processes that address the whole population with additional emphasis among socially vulnerable groups.
- Ensure the development and implementation of guidelines for quality assurance in cancer screening, which must include equity as a quality criterion.

Governance, quality and cancer screening

Planning the cancer screening programme step by step is necessary. The web service helps you in different phases of planning, implenetation and quality improvement.



https://cancerregistry.fi/screening/ipaac-cancer-screening-infograph/

Main findings, summary from the iPAAC Joint Action

1. It is important to identify not only the barriers to early diagnosis of cancer, but also the impact of such barriers on inequalities. This burden to health systems could be reduced if inequalities were systematically addressed. According to the iPAAC survey, for instance oral cancers and skin cancers have delays of early detection due to inequalities.

2. Evidence for early diagnosis and treatment requires well planned piloting, better data management and examining appropriate balance of harms and benefits. Further research is essential for establishing programmatic services.

3. The role of informing people of early cancer signs is very valid.

4. Early detection is not possible in all cancer types. There are cancers with no early warning signs; there are rare cancers and cancers where there is not enough knowledge of early signs. Lack of evidence is a high barrier.

6. High risk groups and vulnerable populations need tailored approaches both in early diagnosis and cancer screening.

7. In EU council recommended cancer screening programmes (cervical, colorectal and breast), there are disparities between Member States, regions and between various population groups. The challenges with social inequalities in health are an important focus area.

8. Population-based screening programmes should function better in Europe. There are requirements for good governance for implementing the quality assurance step by step, as recommended by the European guidelines.

9. We need to focus on finding solutions for better coverage, legal frameworks, governance structures and standardized data at the pan-European level. Both social and technological innovations are welcome to foster solutions and sustainability.
An inclusive, multi-disciplinary and multi-stakeholder voice is needed for finding social advances and innovations in cancer screening

10. In cervical cancer screening the HPV vaccination status will change the screening needs and algorithms. HPV vaccination and cervical screening coverage vary highly between the Member States. More collaboration between research centers and screening coordinators and evaluators is necessary.

11. Risk-stratified approaches are under development. Modifications to screening protocols have been proposed based on multiple factors, such as screening history, biological and risk factors, family risks, and genetic susceptibility. The evidence-base for risk-stratified screening is not yet available, or weak, and further studies and results are still awaited.

12. In lung cancer screening research is still ongoing. How to select and reach the potential target population and how to best integrate interventions on smoking cessation with screening are still among questions to be solved in a population-based setting. Need of systematic reviews and appropriate cost-efficacy evaluations, taking also into account unreported aspects of the trials (such as protocols related to so-called incidental findings).

13. Prostate cancer screening is based on currently studied PSA-test methods, which is a controversial issue. The balance of benefit and harm due to overdiagnosis is to be solved. New methods are under research, and their effectiveness needs to be studied in screening trials.

14. What is the role of genomics, giving promising results in cancer care? In public health policies, such as population-based screening programmes, many open questions remain. How do we inform about surveillance programmes for high-risk individuals if individual-level genetic data will become more common? Truthful communication of both harms and benefits is one area of discussion.

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