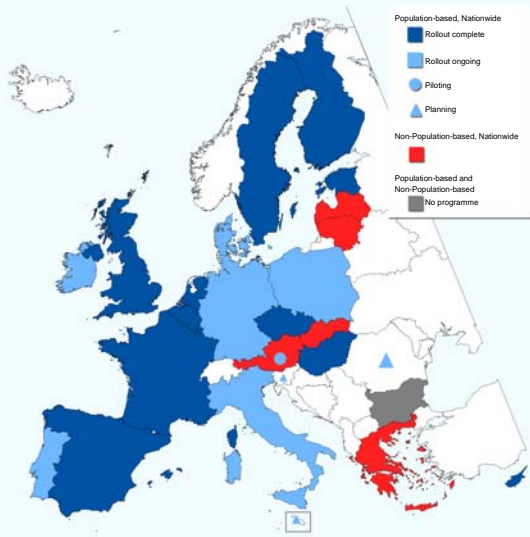


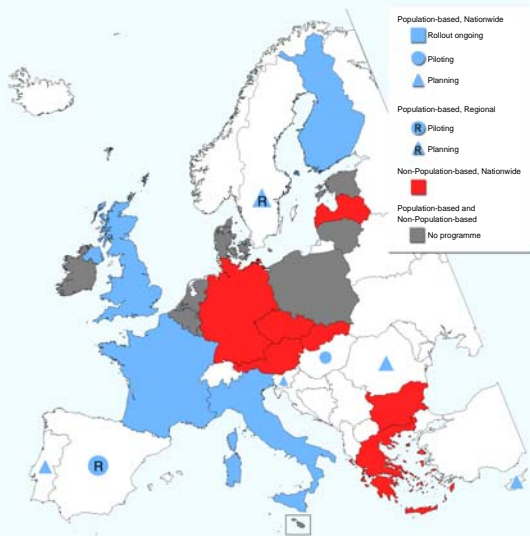
### Breast Cancer Screening Programmes in the EU in 2007



### Cervical Cancer Screening Programmes in the EU in 2007



### Colorectal Cancer Screening Programmes in the EU in 2007



L 327/34 Official Journal of the European Union 16.12.2003

#### COUNCIL RECOMMENDATION of 2 December 2003 on cancer screening (2003/878/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 152(4), second subparagraph, thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament,

Whereas:

- (1) Article 152 of the Treaty provides that Community action is to complement national policies and be directed towards improving public health, preventing human illness and diseases, and obviating sources of danger to human health. Such action shall cover the fight against the major health scourges, by promoting

# Cancer screening in the European Union

## Report on the implementation of the Council Recommendation on cancer screening

*First Report*



European Commission

**Cover:**

Upper left: Breast Cancer Screening Programmes in the EU in 2007

Upper right: Cervical Cancer Screening Programmes in the EU in 2007

Lower left: Colorectal Cancer Screening Programmes in the EU in 2007

Lower right: Council Recommendation of 2 December 2003 on cancer screening (2003/878/EC)

**Acknowledgements:**

Source, upper left, upper right, lower left: International Agency for Research on Cancer, Lyon, France

Source, lower right: Official Journal of the European Union L 327/34 (16.12.2003)



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# Cancer Screening in the European Union

Report on the implementation of the Council Recommendation on cancer screening

*First Report*

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Centre International de Recherche sur le Cancer

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# Prefaces



# Preface

By Androulla Vassiliou, European Commissioner for Health

Cancer is a major cause of suffering and death in the European Union. Every year around 3.2 million Europeans are diagnosed with cancer; a burden that is expected to grow even greater due to demographic trends in Europe. But with regular and systematic examinations, using evidence-based screening tests followed by appropriate treatment, it is possible to reduce cancer mortality and improve the quality of life of European citizens who are suffering from cancer by detecting cancer at earlier stages, when it is more responsive to less aggressive treatment. This brings benefits not only to the individuals concerned, but through early action, screening can help to minimise the economic and social burden of cancer on society as a whole.

The Council Recommendation on cancer screening, adopted unanimously by the Health Ministers of the European Union in December 2003, sets out fundamental principles of best practice in early detection of cancer, and represents a shared commitment by Member States to implement cancer screening programmes. As this scientific report on the implementation of the Council Recommendation shows, this shared commitment is being steadily translated into concrete action across the Union, with many Member States running or establishing population-based screening programmes for breast, cervical and colorectal cancer.

These programmes take much time and effort to implement effectively. Five years on, we are still only around half-way to ensuring that everyone who should be covered according to the Recommendation actually is. Nevertheless, the commitment to addressing cancer remains, as recently also reaffirmed by both the Council and the Parliament, and the Commission will continue to support Member States in implementing the Recommendation, and in tackling cancer more generally.

The impact of the Council Recommendation on cancer screening throughout the European Union exemplifies the unique role that the EU can play in cooperation with national governments, professional organisations and civil society to maintain and improve the health of Europe's citizens. This report provides a solid scientific reference point for assessing our progress in implementing the Council recommendation on cancer screening. I am confident that it will be a valuable document in our continued action against cancer.

Brussels, May 2008

# Preface

Maja Primic-Žakelj \*

Population-based cancer screening using evidence-based tests has considerable potential to improve the health of the population, provided that programmes are implemented cost-effectively and with high quality. The population-based approach ensures that screening also reaches the less fortunate who may be in greatest need of secondary prevention of cancer, and it also stimulates continuous improvement in the quality of diagnostic and therapeutic services wherever they are provided. The substantial progress resulting from effective implementation of nationwide, population-based cancer screening programmes makes such efforts particularly attractive to policy makers and health professionals seeking to reduce the health disparities in the European Union.

This applies particularly to the Member States which recently acceded to the EU. Despite lesser economic resources, many of these countries are facing steeper increases in the burden of cancer than elsewhere in the EU, due to more pronounced demographic trends with increasing proportions of the older age groups affected by cancer in the population. In these countries, the prospect of benefiting from the previous experience in other Member States and the need to make careful choices in allocation of resources for health are of fundamental importance. Furthermore, in many of the new Member States, opportunistic screening, without quality assurance and control is using scarce resources intended for public health. Unfortunately, there is benefit, if any, only for a small population group and the effect of this activity is not reflected in better survival due to earlier cancer detection or in reduced mortality.

The recent experience in Slovenia in establishing a population-based breast cancer screening programme based on the European quality assurance guidelines (after introduction of a population-based cervical cancer screening programme in 2003) has demonstrated that adopting the right policy is only the first important step in effectively implementing cancer screening. As pointed out in the EU guidelines, achievement of high quality screening requires political support, sufficient infrastructure and financing, and supervision. Considerable time and effort and additional financial resources are required to successfully complete the planning and preparatory phase. Approximately five years have expired from the beginning of the consensus-building and planning process to the start of programme rollout in Ljubljana in April, 2008. The region served by population-based screening will be expanded gradually over the next few years in order to take the experience in each phase of rollout into account, and in order to assure cost-effectiveness. By the time the last invitation in the first round of screening is sent, approximately nine years will have expired from the beginning of planning to the completion of nationwide programme rollout. The present report shows that the length of this process and the scope of activities are typical of the experience in other Member States.

Many persons and institutions have contributed to the efforts leading up to the launch of the Slovenian Breast Screening Programme. Unfortunately, they cannot all be mentioned here. Their substantial contributions and efforts are gratefully acknowledged. Although each contribution has been essential, with hindsight, one of the most significant impediments which had to be overcome to successfully implement the breast screening programme was the

scarcity of appropriate professional, technical and scientific support for planning the programme, for training and supervising the learning organisation which will manage and deliver the screening services, and for establishing the monitoring of performance and the evaluation of the impact of screening on the burden of disease in the population. Completion of the planning phase and the initiation of programme rollout during the current EU presidency in Slovenia would not have been possible without recruitment of a multidisciplinary advisory team experienced in population-based programme implementation through the Screening Quality Control Group at the International Agency for Research on Cancer in Lyon where the coordination office of the European Cancer Network is located.

Since December 2006 the Screening Monitoring and Evaluation Unit in the Dept. of Epidemiology and Cancer Registry at the Institute of Oncology Ljubljana and the Slovenian Ministry of Health have collaborated with the ECN and IARC experts in planning the programme organisation and rollout, in establishing the procedures and protocols, and in providing the requisite multidisciplinary training and professional supervision in the start-up phase of the Ljubljana Screening Unit and the Programme Coordination Office at the Institute of Oncology Ljubljana.

The importance of a European advisory capacity for timely and effective implementation of population-based cancer screening programmes has also been pointed out at the pan-European conference held in February, 2008, in Brdo, Slovenia: *The Burden of Cancer - How Can it be Reduced?* The conference took place in the framework of the first Presidency of the Council of the European Union held by one of the twelve newly acceded Member States. The attending experts and the representatives of the national authorities responsible for the health of nearly 500 million individuals in the EU called for professional, organisational and scientific support for Member States seeking to establish and improve population-based screening programmes, and they pointed out the need to make appropriate resources available for such efforts, including monitoring, evaluation, accreditation and certification of services fulfilling European standards. Given the considerable time and effort required to plan and successfully implement effective cancer screening programmes, and in light of the large volume of screening examinations which will be required in the coming years to make programmes of appropriate quality available to all persons in the EU who may benefit, the time has come to take further action at the Community level to make the resources for pan-European collaboration and cooperation available on a scale which is appropriate to the task.

Ljubljana, May 2008

\* Head of Epidemiology and Cancer Registry Unit at the Institute of Oncology Ljubljana

# Preface

Peter Boyle \*

Breast, cervical and colorectal cancer are major health burdens in the Member States of the European Union. According to the 2006 estimates of the International Agency for Research on Cancer, 331,000 cases and 90,000 deaths due to breast cancer, and 36,500 cases and 15,000 deaths due to cervical cancer were reported in women in the EU. Colorectal cancer deaths were registered for 68,000 women and 78,000 men, and new cases of colorectal cancer were reported in 140,000 women and 170,000 men. The burden of disease is particularly unevenly distributed in the case of cervical cancer: the proportion of cases and deaths is markedly elevated in all but one of the Member States which acceded to the EU in 2004 and 2007.

Experience in the *Europe Against Cancer Programme* has shown that the overall burden of these cancers in the population and the pronounced disparity between EU Member States in the burden of disease could be substantially reduced by implementation of population-based screening programmes of appropriate high quality. In 2003, based on the positive results of the *Europe Against Cancer Programme*, the Council of the European Union recommended implementation of respective screening programmes in the Member States, according to European quality assurance guidelines where they exist.

This present report focuses on the **implementation** of the Council Recommendation on Cancer Screening in the EU, prepared four years after adoption, and shows that Europe leads the way world-wide in implementation of population-based screening, with over 50 nationwide programmes for breast, cervical or colorectal cancer currently running or being established and over half a billion examinations, at current levels, being performed over a 10-year period in the EU. The lessons learned in Europe in managing, monitoring and improving the quality of screening on such a large scale will be instructive for other regions of world preparing to implement and expand population-based screening programmes in coming years.

Despite the progress demonstrated in the first report on implementation of the Council Recommendation on Cancer Screening, there is no room for complacency in the current efforts to make population-based screening available to all persons in Europe who may benefit. Furthermore, substantial resources urgently needed for implementation of cost-effective programmes are currently consumed by an excessive volume of examinations in programmes which still lack the population-based approach essential to adequate quality assurance. This is particularly true of many cervical cancer screening programmes, which currently provide over one-half of all screening examinations performed in the EU. The screening intervals applied in such programmes are commonly much shorter than the 3 to 5 years recommended in the European guidelines. They are not justified by the natural history of the disease and they are frequently applied in non-population-based programmes which do not identify and personally invite all eligible women in the target population. This leads to overuse of screening by a portion of the target population accustomed to consuming health resources, and underuse by many women who would be even more likely to benefit from attending screening. Many more lives could be saved and additional resources could be

mobilized for further implementation of programmes of appropriate quality, if Member States would take further action to follow-up on the Council Recommendation by converting opportunistic screening programmes to the population-based approach with personal invitation of each eligible person to attend screening at the appropriate time.

Continuously improved quality assurance guidelines based on scientifically sound and applicable screening standards are essential to assuring that population-based programmes of appropriate quality and effectiveness are available to all persons who may benefit from cancer screening. The International Agency for Research on Cancer (IARC) provides scientific and technical support for continued development of the European guidelines for quality assurance of breast, cervical and colorectal cancer screening. These activities, which are co-funded by the EU Health Programme, are coordinated by the Screening Quality Control Group which also provides the coordination office of the European Cancer Network in which the former European Cancer Screening Networks established under the *Europe Against Cancer Programme* have been consolidated. The fundamental principles of quality assurance elucidated in the EU guidelines, and the methodological approaches to their widespread application in nationwide screening programmes also apply to settings in which resource limitations require different test procedures, or a significantly lower number of screening tests per person, such as once-in-a-lifetime screening for cervical cancer by visual inspection. The commitment of the Agency to international collaboration in the further development and application of the European screening guidelines is therefore also an important part of the efforts of the Agency to provide scientific and technical support for regions of the world in which implementation of cancer screening programmes is less developed than currently is the case in Europe.

The first report on implementation of the Council Recommendation on Cancer Screening also reflects the crucial importance of providing adequate sustainable resources for planning and piloting population-based cancer screening programmes before they are rolled out across a country. The current bottleneck resulting from the scarcity of multidisciplinary teams experienced in the complex task of assisting countries preparing to implement population-based cancer screening programmes should be a matter of concern for policy makers around the world. Approaches to alleviate this situation will be addressed by the Agency in the pilot programme for accreditation and certification of breast cancer screening, diagnosis and management currently being developed at the request of the European Commission. The programme will be coordinated by the Screening Quality Control Group in collaboration with the European Cooperation for Accreditation with financial support of the European Union.

Lyon, May 2008

\* Director, International Agency for Research on Cancer

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# **Executive Summary**



## Executive Summary

### Rationale of the Council Recommendation on Cancer Screening

After circulatory disease, cancer is the second largest cause of death in the European Union, accounting for two out of ten deaths in women and three out of ten deaths in men in 2006. Substantial proportions of the cancer deaths in the EU are attributable to breast, cervical or colorectal cancer. According to 2006 estimates of the International Agency for Research on Cancer, over 250,000 deaths due to these cancers in men and women were reported in the European Union (Fig. 1). The annual rates of these cancers vary widely across the EU, reflecting a substantially elevated health burden in many Member States (Fig. 2, Tables 1 and 2). Regular, systematic examination of predominantly asymptomatic individuals of average risk and of appropriate age using evidence-based screening tests followed by appropriate treatment has the potential to prevent many deaths due to these cancers and thereby significantly reduce the burden of disease in the population [18-20]<sup>4</sup>.

A large body of knowledge on implementation of cancer screening programmes has been acquired through the screening networks established under the Europe Against Cancer programme which have been consolidated under the current EU Health Programme in the European Cancer Network. The EU networks have shown that the potential benefit of cancer screening may only be achieved if quality is optimal at every step in the screening process which includes identification and personal invitation of the target population, performance of the screening test and, if necessary, diagnostic work-up and treatment of screen-detected lesions, and aftercare. Screening is performed on predominantly healthy persons; comprehensive quality assurance is also required to maintain an appropriate balance between benefit and harm in the large numbers of persons eligible to attend cancer screening programmes. Achieving and maintaining high quality at every step in the screening process requires an integrated, population-based approach to health service delivery. This approach is essential in order to make screening accessible to those in the population who may benefit and in order to adequately monitor, evaluate and continuously improve performance [14, 15, 22, 33].

On 2 December 2003 the Health Ministers of the European Union unanimously adopted a recommendation on cancer screening based on the developments and experience in the Europe Against Cancer programme [11, Annex 2]. The Recommendation of the Council of the European Union spells out fundamental principles of best practice in early detection of cancer and invites EU Member States to take common action to implement national cancer screening programmes with a population-based approach and with appropriate quality assurance at all levels, taking into account European quality assurance guidelines for cancer screening, where they exist. Updated and expanded EU guidelines for breast [14] and cervical cancer screening [15] have recently been published by the European Commission; comprehensive European guidelines for quality assurance of colorectal cancer screening are currently in preparation.

### Methodology of the present report

The present report on implementation of the Council Recommendation is based on a written survey of the 27 Member States conducted by the European Commission Directorate-General for Health and Consumers in the second half of 2007 (Annex 3) and supplemented by information obtained directly from health authorities and screening programmes in the Member States as well as in two pan-European projects in the EU Health Programme dealing with monitoring, evaluation and quality assurance of cancer screening (European Cancer Network – ECN, and European Network for Information

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<sup>4</sup> Evidence-based screening tests currently recommended by the Council of the European Union: pap smear screening (cervical cytology) for cervical cancer precursors starting not before the age of 20 and not later than the age of 30 years; mammography screening for breast cancer in women aged 50 to 69 years in accordance with European guidelines on quality assurance in mammography screening; faecal occult blood screening for colorectal cancer in men and women aged 50 to 74 years.

on Cancer - EUNICE). The latest population statistics were obtained from EUROSTAT, or from national sources if more recent data was available. Filled in questionnaires were received from twenty of the Member States by December 2007. Additional data was solicited from health authorities and screening programmes in the Member States from which filled in questionnaires were not available. Data from the ECN and EUNICE projects was used to check the plausibility of, and to expand the data base. Interim results of the present report were presented at two pan-European meetings which have taken place in the framework of the Slovenian presidency of the Council of the European Union. Up to May 2008 additional and updated information was received from several Member States, including two additional filled in questionnaires, and data from the remaining five Member States from which filled in questionnaires had not been received. The status of cancer screening programmes reported in the present first report on implementation of the Council Recommendation on Cancer Screening is therefore based on official information provided by all of the 27 Member States. The report will be regularly revised to provide a basis for continued efforts to expand and update the follow-up of the Council Recommendation at the level of the European Union.

### **Breast cancer screening in the EU**

In 2007 more than 59 million women in the EU were of the target age for breast cancer screening based on mammography specified in the Council Recommendation (50-69 years). Four out of 10 women in this age group in the EU (41%) were targeted for breast cancer screening by 11 Member States in which nationwide rollout of population-based programmes was complete in 2007. A slightly higher proportion of the women in this age group in the EU (44%) was targeted for breast cancer screening by the seven Member States in which nationwide rollout of population-based breast screening programmes was ongoing in 2007. Non-population-based programmes were running in five Member States, one of which was also piloting population-based programmes. No screening programme based on mammography was running or being established in only one Member State in 2007.

Women outside the age range 50-69 years were also eligible to attend breast screening programmes in a number of Member States in 2007. In the Member States which have adopted a population-based approach for breast cancer screening, the smallest target age range is 50-59 years and the largest age range is 40-74 years. The limits of the target age for breast cancer screening in the EU varied between 40 and 75 years in 2007. The lowest age targeted was less than 50 years in 8 Member States; the highest age targeted was over 69 years in the same number of Member States. In 2007, over 64 million women in the EU were targeted for, and approximately 12 million women attended breast cancer screening programmes based on mammography.

### **Cervical cancer screening in the EU**

Nearly 109 million women in the EU in 2007 were in the age range 30-60 years which corresponds to the minimum target age recommended in the recently published second edition of the European Guidelines for Quality Assurance in Cervical Cancer Screening [15].<sup>5</sup> Five out of ten 30-60-year-old women in the EU (51%) were targeted for cervical cancer screening in the 17 Member States which had adopted policies aiming for implementation of population-based screening programmes. Two out of 10 women in this age group in the EU (22%) were targeted for cervical cancer screening by the population-based programmes which were rolled out nationwide in seven Member States in 2007. Five out of 10 women in this age group in the EU (47%) were targeted by cervical cancer screening programmes in the 12 Member States which have adopted non-population-based policies. Four Member States had dual programme type or status and two Member States were not running or establishing cervical screening programmes in 2007.

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<sup>5</sup> The current second edition of the European Guidelines for Quality Assurance in Cervical Cancer Screening recommends 30-60 years or 30-65 years as the minimum age group to target for cervical cancer screening.



The full age range targeted for cervical cancer screening varied considerably across the EU in 2007; the lowest age to begin screening was less than 30 years in 19, and the highest age targeted for screening was over 60 years in 16 Member States.<sup>6</sup> If women outside the 30-60-year-old age range are taken into account, approximately 146 million women were targeted by cervical cancer screening programmes which were running or being established in the EU in 2007. Approximately 32 million women in the EU attended screening programmes based on cervical cytology in 2007.

### **Colorectal cancer screening in the EU**

Approximately 136 million women and men in the EU in 2007 were in the target age group for colorectal cancer screening specified in the Council Recommendation (50-74 years). Over four out of 10 women and men (43 %) in this age group in the EU were targeted for colorectal cancer screening by the 12 Member States which have adopted policies aiming for implementation of population-based programmes. Three out of 10 women and men (34%) in this age group in the EU were targeted for colorectal cancer screening by the five Member States rolling out population-based programmes nationwide in 2007. Approximately three out of 10 women and men (27%) in this age group in the EU were targeted for colorectal cancer screening by the seven Member States which have adopted policies aiming for implementation of non-population-based programmes. No screening programmes were running or being established in eight Member States in 2007. If women and men outside the age range 50-74 years are taken into account, approximately 107 million individuals were targeted by colorectal cancer screening programmes which were running or being established in the EU in 2007.

The age range targeted for colorectal cancer screening varied considerably across the EU. Colorectal cancer screening began at ages above 50 years in screening programmes based on the faecal occult blood test (FOBT) in three Member States, and in programmes based on endoscopy in two Member States. The oldest eligible age to attend FOBT-based colorectal cancer screening was less than 74 years in programmes in nine, and more than 74 years in seven Member States. In 2007, approximately 12 million women and men attended colorectal cancer screening programmes in the EU. In more than nine out of 10 cases (approximately 94%), screening was based on the faecal occult blood test (FOBT), which is the evidence-based screening method currently recommended by the Council. The other screening tests were based on endoscopy (flexible sigmoidoscopy or colonoscopy), a novel test method which is still under evaluation.

### **Impact of the Council Recommendation**

Four years after its adoption, most Member States have acted on the Council Recommendation, and most Member States intend to undertake further action where implementation is not yet complete. The scale of these activities underlines the substantial impact which recommendations of the Council of the European Union can have on the health of the European population.

A long-term translational phase is essential to successfully plan, pilot and rollout population-based cancer screening programmes across an entire country, and particularly also across several countries. The time frame depends, to a large extent, on the professional and organisational capacity which must be developed to successfully perform, monitor and evaluate high quality services integrating all steps in the screening process. This activity not only entails coordination of complex communication and training, but also integration of multidisciplinary teams into the diagnosis and treatment of screen-detected lesions, and integration of cancer registration and cancer registries into the monitoring and evaluation of programme performance. Even in countries with relatively small target populations, the magnitude of the task can be substantial, compared to initially available resources. Successful preparation and completion of the nationwide implementation process may require ten years or more.

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<sup>6</sup> See footnote on page 20.

It is for this reason that the full impact of the Council Recommendation on the implementation of breast, cervical and colorectal cancer screening programmes in the EU cannot be assessed at this time. Nevertheless, the present report documents considerable activities in the EU Member States aimed at following through on the Council Recommendation. Approximately 55 million examinations were performed on persons attending screening programmes for breast, cervical or colorectal cancer in 26 Member States in 2007. A substantial number of these examinations (approximately 23 million) were provided by population-based screening programmes. Given the less widespread implementation of population-based cancer screening programmes in 2003, it is unlikely that this substantial volume of screening in the EU would have been achieved in the absence of the Council Recommendation. Although currently available data is non-exhaustive, over 70 complex actions in the 27 Member States specifically aimed at implementation of screening programmes have been recorded since 2003, the year in which the Council Recommendation was adopted. Although all of these actions have been taken as a result of decisions at the national or regional level, and many actions were set in motion prior to adoption of the Council Recommendation, the discussion leading up to adoption of the Recommendation and the pan-European exchange between policy makers and experts stimulated by this clear Community health policy are likely to have facilitated the adoption and implementation of many of the respective actions (see Annex 4).

Furthermore, the large numbers of EU Member States which are currently running or establishing population-based breast, cervical and colorectal cancer screening programmes (N=22, 17, and 12, respectively) indicate that four years after adoption of the Council Recommendation there is substantial agreement between the Member States in the enlarged EU and the Council on the health policy priority of establishing cancer screening programmes of appropriate quality. The scale of these activities underlines the substantial impact which actions at the Community level can have on the health of Europe's citizens.

### **Current disparity in implementation of cancer screening in the EU**

Despite widespread agreement among the Member States on the importance of population-based screening programmes as a tool of cancer control, considerable effort will be required over the coming years to successfully implement current policies and to overcome existing barriers to programme implementation throughout the EU. This is reflected in the numbers of Member States in 2007 in which nationwide rollout of population-based breast, cervical and colorectal cancer screening programmes was still ongoing (N=7, 3 and 5 Member States, respectively) or had yet to begin because screening programmes were currently regionally limited or only in the piloting or planning phase (N=4, 7 and 5 Member States, respectively) or because no programme policies of any type for breast, cervical or colorectal cancer had been adopted (N=1, 2, and 8 Member States, respectively).

### **Community added value of transition to population-based screening programmes**

Non-population-based breast, cervical and colorectal cancer screening programmes are still conducted in 5, 12 and 7 Member States, respectively, which currently target over 100 million women and men in the EU for 145 million examinations per respective round of screening. Most of the examinations offered in non-population-based programmes are for cervical cancer screening (89 million) and colorectal cancer screening (48 million). Transformation of these programmes to the population-based approach, with quality assurance at all appropriate levels has the potential to substantially improve the accessibility, effectiveness and the cost-effectiveness of the respective services. At the same time, substantial numbers of unnecessary screening examinations could be avoided by adhering to the interval for cervical cancer screening recommended in the European guidelines (3-5 years).

## Barriers to and prospects for further progress

The current need for additional efforts to monitor and improve screening services provided to the population in the EU is also reflected in the qualitative information provided by 22 Member States from which filled in questionnaires were received for the present report. Whereas eight out of 10 Member States reported that they followed at least two out of three items in the survey dealing with most of the principles specified in the Council Recommendation, this level of compliance was only reported by 4 out of 10 Member States for items dealing with monitoring (36%) and scientific evaluation prior to introduction of novel screening tests (41%). Furthermore, a high proportion of the Member States (82%) reported that they follow the recommendation to provide human and financial resources to assure appropriate organisation and quality control. Yet only 41% of the Member States indicated that the resources being provided for these important tasks are satisfactory (Annex 5).

The results of the present implementation report were discussed at the recent Slovenian EU Presidency Conference held on 6-7 February 2008 in Brdo.<sup>7</sup> The attending policymakers and experts in cancer prevention from across the EU noted that at current levels, over 500 million breast, cervical and colorectal cancer screening examinations will be performed in the EU over the next 10 years. The great potential of such a large effort to reduce the burden of disease through earlier detection and treatment of cancer was widely acknowledged. However, due to a lack of reliably collected and regularly reported information, too little is known at the Community level about the quality, effectiveness and cost-effectiveness of this activity. Regular, systematic monitoring, evaluation and EU-wide status reporting would promote the exchange of information on successful developments between Member States and would identify weak points requiring improvement.

Although the current annual volume of screening examinations in the EU is considerable, this volume is less than one-half of the minimum annual number of examinations that would be expected if the screening tests specified in the Council Recommendation were available to all EU citizens of appropriate age (approximately 125 million examinations per year). Furthermore, less than one-half of the current volume of examinations (41%) is performed in population-based programmes. However, a population-based approach is necessary to implement comprehensive quality assurance.

There was broad consensus between policymakers and experts attending the Slovenian EU Presidency Conference that the present situation underlines the need for further efforts at the European level to facilitate implementation of the Council Recommendation.

Despite the need for further efforts, the substantial progress made in the implementation of cancer screening programmes in the EU since adoption of the Council Recommendation on Cancer Screening should not be overlooked. The positive experience with the Council Recommendation in encouraging successful implementation of complex population-based programmes reaching large segments of the European population with highly specialized multidisciplinary services integrating a broad range of health care providers, regulators and other institutions should be taken into account in future efforts to improve the control of cancer and other chronic disease in the EU.

In particular, future Community efforts should recognize the importance of a translational phase permitting appropriate integration of new preventive or therapeutic strategies into existing health care systems and programmes. Furthermore, the effectiveness of appropriately integrated strategies under "real life" conditions should be demonstrated before new programmes or modifications of existing programmes are considered to be fully established. Pan-European collaboration in such translational efforts has the potential to accelerate health improvements across the EU by avoiding unnecessary duplication of effort and by focusing available resources on common problems.

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<sup>7</sup> *The increasing burden of cancer - How can it be reduced?* European conference held in Brdo, Slovenia, 6-8 February 2008, under the auspices of the Slovenian Presidency of the Council of the European Union

## **Conclusions and recommendations**

The adoption of the Council Recommendation on Cancer Screening in 2003 is a prime example of the way in which agreement of joint priorities and principles of health policy at the Community level can stimulate EU-wide implementation of programmes aiming to improve the health of the European population.

The positive experience with the Council Recommendation in encouraging successful implementation of complex population-based programmes reaching large segments of the European population should be taken into account in future efforts to improve the control of cancer and other chronic disease in the EU.

Despite the broad consensus at the Community level and among the Member States in the expanded EU on the importance of population-based screening as a tool of cancer control, considerable effort will be required over the coming years to successfully implement current policies and to overcome existing barriers to successful programme implementation.

Even though the number of individuals currently attending cancer screening programmes in the EU is still far from the level which can be achieved in the future, the expenditure in human and financial resources is already considerable. The scale of these resources and the challenge of maintaining an appropriate balance between benefit and harm of screening call for an adequate strategy at the Community level to ensure that appropriate professional, technical and scientific support is available to Member States seeking to close the current gap between the status quo, and the potential of future expansion of evidence-based screening programmes to improve the health of the population.

Adequate provision should also be made for the translational phase of investigation, planning, prioritising, and piloting prior to nationwide rollout of programmes or programme modifications, and for research on innovative screening tests and on the impact of screening in the population. This particularly holds for potentially more effective methods than the currently recommended test for colorectal cancer screening (FOBT) and for new methods of testing and complementary preventive approaches (such as HPV vaccination and testing for primary and secondary prevention of cervical cancer). New preventive strategies should neither be recommended for routine use in population-based programmes nor in clinical practice until efficacy, benefits, and adverse effects, as well as cost-effectiveness, have been adequately investigated.

Increased exchange of information and collaboration between Member States, and professional, organisational and scientific support for Member States seeking to establish or improve population-based screening programmes will also be required to successfully implement the Community strategy.

Such assistance should be based on an appropriate technical and expert advisory capacity, as well as regular, systematic monitoring, evaluation and EU-wide status reporting on implementation of cancer screening programmes.

Development and piloting of an EU-wide accreditation/certification scheme mandated by the Member States and based on EU quality assurance guidelines would encourage programmes throughout the EU to take the initiative to continuously improve performance and would help consumers to recognise which services achieve the EU standards.

Given the current need for professional, organisational and scientific support for Member States seeking to implement or improve cancer screening programmes, adequate resources for appropriate Community actions are vital.

# Report



## 1 Introduction

After circulatory disease, cancer is the second largest cause of death in the European Union, accounting for two out of ten deaths in women and three out of ten deaths in men in 2006 (Fig. 1 a). Substantial proportions of the cancer cases and deaths in the EU are attributable to breast, cervical or colorectal cancer. According to 2006 estimates of the International Agency for Research on Cancer, 331,000 cases and 90,000 deaths due to breast cancer, and 36,500 cases and 15,000 deaths due to cervical cancer were reported in women in the EU. New cases of colorectal cancer were reported in 140,000 women and 170,000 men. Colorectal cancer deaths were registered for 68,000 women and 78,000 men in the EU. Together, these cancers account for one out of two (47%) new cases and one out of three (32%) cancer deaths in women in the EU. In men, colorectal cancer currently accounts for one out of eight (13%) new cases and one out of nine (11%) cancer deaths (Fig. 1 b and c). The reported rates of these cancers vary widely across the EU, reflecting a major health burden in various Member States. The burden of disease is particularly unevenly distributed in the case of cervical cancer. The proportion of cases and deaths attributed to this cancer is markedly elevated in all but one of the Member States which acceded to the EU in 2004 and 2007 (Tables 1 and 2, Fig. 2 a - h).

Regular, systematic examination of predominantly asymptomatic individuals of appropriate age using evidence-based screening tests followed by appropriate treatment has the potential to significantly reduce the burden of breast, cervical and colorectal cancer in the population. This is accomplished by detecting and treating malignant tumours and precursor lesions earlier than would be the case without screening. However, this benefit may only be achieved if quality is optimal at every step in the screening process. Adequate quality assurance requires substantial efforts, due to the complexity of the screening process which extends from identification and invitation of the target population, to performance of the screening test and, if necessary, diagnostic work-up and treatment of screen-detected lesions; and aftercare [14, 15, 19-20, 22, 33].

There are several examples of effective implementation of population-based cancer screening programmes in the European Union. Given the available space, they cannot all be mentioned here. A number of examples are provided in Annex 6 and in [18]. They include substantial decreases in cervical cancer mortality subsequent to introduction of population-based screening in Finland, and the United Kingdom, and less substantial, but pronounced reductions in breast cancer mortality after introduction of population-based screening in Sweden, Denmark, or The Netherlands. Similar benefits can be expected in other Member States seeking to implement or improve population-based cancer screening programmes.

Extensive knowledge and experience of screening has been acquired through the screening networks established under the Europe Against Cancer programme.<sup>8</sup> The European screening networks have shown that a population-based approach provides the organisational framework essential to monitoring and maintaining high quality at every step in the screening process. Nationwide implementation of population-based screening programmes makes services performing to the high standards accessible to the entire population eligible to attend screening. Large numbers of professionals undertake further specialisation in order to meet the screening standards. Consequently, these nationwide efforts also contribute to widespread improvement in diagnosis and management of cancers which are detected outside of screening programmes.

The Health Ministers of the European Union have unanimously adopted a recommendation on cancer screening (Annex 2: Council Recommendation of 2 December 2003 on Cancer Screening [11]) based on the positive experience in the Europe Against Cancer programme and a number of its key achieve-

<sup>8</sup> The "Europe Against Cancer" programme" consisted in six successive Community action plans against cancer adopted for the period 1987 to 2002.

ments, such as recommendations developed by the Advisory Committee on Cancer Prevention [1], the European Code Against Cancer [8], and the European Guidelines for Quality Assurance in Breast and Cervical Cancer Screening (for current editions see [14, 15]). The recommendation on cancer screening of the Council of the European Union acknowledges both the significance of the burden of cancer in the European population and the evidence for effectiveness of breast, cervical and colorectal cancer screening in reducing the burden of disease. The Council Recommendation spells out fundamental principles of best practice in early detection of cancer and invites Member States to take common action to implement national cancer screening programmes with a population-based approach and with appropriate quality assurance at all levels, taking into account European Quality Assurance Guidelines for Cancer Screening, where they exist.

The Council Recommendation recognises that the cancer burden is a problem of international character with important health implications and that cancer control requires coordination due to the complexity and the scope of the involved activities and the time and effort required to successfully implement programmes extending over many years. The Member States are encouraged to find appropriate ways of implementing cancer screening programmes according to the recommended common principles, and with appropriate regard for the legal, regulatory, or self-regulatory environments in the individual Member states. Although the Council Recommendation is not legally binding for the Member States, it has widespread political support in the EU. This is reflected in a resolution adopted by the European Parliament in June 2003 urging the Member States to follow similar recommendations for breast cancer screening [12]. The European Parliament reaffirmed this position in a nearly unanimous resolution in 2006 [13].

The Council Recommendation calls on the Member States to report to the European Commission on the implementation of the Recommendation within three years of its adoption and subsequently at the request of the Commission with a view to contributing to the follow-up of the Recommendation at the Community level. The European Commission, in turn, is invited to report on the implementation of cancer screening programmes on the basis of the information provided by the Member States not later than the end of the fourth year after adoption of the Recommendation, to consider the extent to which the proposed measures are working effectively, and to consider the need for further action.

The present report has been prepared for the Commission services based on information provided by the Member States. The report is intended to provide initial feedback on programme implementation and will serve as the basis for continued efforts to expand and update the follow-up of the Council Recommendation at the level of the European Union.

## **2 Methodology**

Information on the implementation of cancer screening programmes in the Member States has been collected in a written survey conducted by the European Commission Directorate-General for Health and Consumers. A questionnaire in the official language of the respective Member State was sent to the EU permanent representations of each of the Member States in Brussels in May, 2007 (see below and Annex 3). Completed questionnaires were returned to the Commission beginning in September 2007 and - if needed - translated into English. After translation, the raw data was entered into a spreadsheet data base. Checks for internal consistency and completeness of the data were performed by comparing the plausibility of data supplied for interrelated items (i.e. "personal invitation" and "population-based screening") and by comparison with data collected in relevant projects in the current EU Health Programme which are coordinated by the International Agency for Research on Cancer (IARC): European Cancer Network (ECN) and European Network for Information on Cancer



(EUNICE). Errors in data reporting or data entry which were detected by the plausibility checks were corrected; and, wherever possible, missing data was obtained from official sources in the respective Member States and from the above-mentioned projects based on reports of participating centres and programmes, official publications and statistics, and the scientific literature. The same procedure for collecting missing data was followed for those Member States from which filled in questionnaires were not received.

Interim results of the present report were presented at two pan-European meetings which have taken place in the framework of the Slovenian presidency of the Council of the European Union. At the FACT<sup>9</sup> conference held in February, 2008, in Brdo, Slovenia (*The Burden of Cancer - How Can it be Reduced?*) health experts and representatives of national health authorities discussed the interim results in the workshop on *Cancer Screening*. Further interim results were reported by the EU Commissioner for Health Androulla Vassiliou at the informal meeting of the representatives of the national health authorities of the EU Member States which was held in Brdo, in April, 2008. The Commissioner also requested that the Member States check the interim results and report corrections and relevant supplemental information which could be used to update the data base prior to publication of the present first report. Up to May 2008 additional information was received from several Member States through their respective official EU representations. Two additional Member States also provided a filled-in questionnaire. The data gathered in this process is therefore based on 22 filled in questionnaires received through the EU representations of the respective Member States and additional information provided by the health authorities of five Member States.

## 2.1 Questionnaire

The wording and the structure of the questionnaire corresponded closely to the format of the Council Recommendation. The questions were designed to acquire information on the national situation. However, in some cases respondents provided regional data which was subsequently collated to the national level. Aggregate annual data was requested for items which can be quantified, such as the number of personal invitations issued and the number of screening examinations performed in the most recently available year. Predefined answer categories (yes; no; not applicable/unknown) were provided for most qualitative data such as information on adherence to specific items in the Council Recommendation. Information in free text format was solicited for those questions which were not amenable to the predefined answer categories, for explanatory comments or for reporting on recent developments.

The 36 questions in the questionnaire, some of which were subdivided in related items, were grouped in three sections (see below).

### **Section I: Role of cancer screening in national cancer control programmes**

Although the Council Recommendation does not specifically refer to national cancer control programmes, section I of the questionnaire deals with this subject matter (four questions) because incorporation of cancer screening into national cancer control programmes may have a decisive impact on the extent to which cancer screening programmes are implemented in a Member State.

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<sup>9</sup> FACT (*Fighting Against Cancer in Europe Today*): a project co-financed by the EU Health Programme which supports the Slovenian EU presidency and which aims to ensure that best practice is shared across the EU and that existing gaps in cancer prevention, screening, treatment and care and research between and within Member States are reduced. <http://www.projectfact.eu/about-the-project/>

## **Section II: Quantitative description of cancer screening in the Member States**

Section II of the questionnaire deals with quantitative information on cancer screening activities in the respective Member State (9 questions). The questions refer to the general approach for programme implementation recommended by the Council, i.e.:

- organised screening programmes
- with a population-based approach

The questions also refer to the screening tests and target groups specifically recommended by the Council:

- mammography screening for breast cancer in women aged 50 to 69
- faecal occult blood screening for colorectal cancer in men and women aged 50 to 74
- Pap smear screening for cervical abnormalities from the ages of 20 to 30 (upper age limit not specified)
- any other screening offered to persons of average risk

Aggregate data is requested for 2005 and, if available, 2006 on:

- The age groups eligible to attend organised screening programmes
- The number of persons invited
- The number of persons complying with respective invitations
- Public costs for organised screening programmes
- The number of persons offered screening without systematic invitation
- The number of screening tests provided to age-eligible persons outside of organised screening programmes and the respective public and private costs

## **Section III: Qualitative information on the fundamental approach to implementation of screening programmes**

Section III of the questionnaire solicits qualitative information on the ways in which cancer screening activities are implemented in the various Member States (23 questions). The 34 items covered by the questions in this section correspond closely to the individual recommendations given in the Council document and are broken down into 6 parts. Due to the close correspondence with the Council document there is some overlap within and between elements in each part.

### **Part 1: Key aspects of implementation of cancer screening programmes**

The items in part 1 deal with basic principles essential to delivery of high quality screening: Population-based approach

- Adherence to EU quality assurance guidelines (for breast cancer screening)
- Full information of participants about benefits and risks
- Adequate comprehensive care for screen-positives
- Adequate human and financial resources for organization and quality control
- Informed programme implementation decisions (based on disease burden, health care resources, side-effects, cost effects, scientific trials and pilot projects)
- Call/recall system and effective diagnosis, treatment and aftercare
- Due regard to data protection

### **Part 2: Registration and management of screening data**

The items in part 2 refer to the infrastructure, methods and activities required to collect and manage the data essential to quality assurance of cancer screening programmes:

- Centralised data systems for running programmes
- Call/recall system to invite all targeted persons
- Data collection, management and evaluation for test performance, assessment and diagnosis
- Data handling in full accordance with data protection legislation

**Part 3: Monitoring of screening programmes**

The items in part 3 are related to part 2 and deal with the professional and technical efforts required to make adequate use of screening data for monitoring and quality assurance.

- Regular monitoring of process & outcome of organised screening by independent peer review and with quick reports to public and staff
- Adherence to ENCR (European Network of Cancer Registries) screening data base standards & EU data protection laws
- Monitoring of programmes by national cancer registries at adequate intervals

**Part 4: Training**

Only one item in the questionnaire (part 4) deals with the important requirement of adequate training for high quality screening.

- Personnel adequately trained at all levels to ensure delivery of high quality screening

**Part 5: Compliance**

Part 5 deals with key issues of ethical and practical importance in information of the women targeted for screening.

- Priority for high compliance to organised screening based on fully informed consent
- Action taken to assure equal access to screening, accounting for special socio-economic groups

**Part 6 Introduction of novel screening tests taking into account international research results**

Part 6 points out key steps in the evidence-based process leading up to governmental decisions on whether or not to implement or modify screening programmes.

- New screening tests only implemented after evaluation in RCTs
- Trials run on any of the following subjects (in addition to screening-specific parameters and mortality): treatment procedures, clinical outcomes, side effects, morbidity, quality of life
- Pooling of representative trials for assessment of level of evidence for new tests
- Final decision on routine implementation of new screening tests only after conclusive results in RCTs and based on cost-effectiveness in respective health care system
- Introduction of test modifications in routine health care only after evaluation of effectiveness, possibly using epidemiologically validated surrogate endpoints

**2.2 Responding Countries and Additional Data Sources**

Filled in questionnaires were obtained from 20 Member States by December 2007. After distribution of the interim results as described above, two additional questionnaires were received. The present report is therefore based on information provided in the questionnaires returned by May 2008 from 22 of the 27 Member States (81%)<sup>10</sup>: For the other five Member States, missing data was collected from official sources<sup>11</sup> and from the ECN and EUNICE projects as described above. Although questionnaires

<sup>10</sup> Filled in questionnaires were received from: Austria, Belgium, Cyprus, Czech Republic, Estonia, France, Germany, Greece, Hungary, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, United Kingdom.

<sup>11</sup> Additional data on the implementation status of cancer screening programmes was provided by the National Ministries of Health in Bulgaria and Denmark, the national Mass Screening Registry in Finland, the National

were not received from all Member States, data provided by official sources was used to classify the screening programme status in all 27 Member states (100%) based on the definitions used in the present report (see section 2.3).

## 2.3 Definitions

The Council of the European Union recommends implementation of cancer screening programmes with an organised, population-based approach, with quality assurance at all appropriate levels. The Council Recommendation describes those elements which are considered essential to fulfil this global standard, but it does not provide definitions of terminology which could be used to compare differences between Member States in the degree to which screening programmes are implemented. In order to focus on the specific elements in the Council Recommendation, the survey questionnaire did not introduce definitions. However, for internal consistency and in order to permit comparison with other reports, the results in the present report are presented using a common terminology based on the uniform definitions described in section 2.3.1 and the respective subsections.

### 2.3.1 Screening programmes

Perceptions of what constitutes a screening programme vary widely. The responses to the present survey and experience in the ECN and EUNICE projects reflect the wide consensus that a minimum degree of public responsibility, organisation and supervision is required for screening activities to be understood as taking place in the context of a programme as opposed to non-programme screening. However, substantially more organisational elements are commonly regarded as essential in order to refer to screening activities as taking place in an "organised" programme. In practice, differentiation between "organised" and "unorganised" screening programmes is, to a certain extent, arbitrary and does not take into account the continuous gradient extending from poorly organised to highly organised programmes. The terminology used in the present report reflects the above considerations.

#### 2.3.1.1 "Programme" vs. "non-programme" screening

In many health care systems, prophylactic examination of apparently healthy individuals for the purpose of early detection and treatment of cancer may take place both in the framework of publicly mandated screening programmes as well as outside of any such programme. To qualify as a programme there should be a public screening policy documented in a law, or an official regulation, decision, directive or recommendation. The policy should define, as a minimum, the screening test, the examination intervals and the group of persons eligible to be screened; and the screening examinations should be financed by public sources (apart from a possible co-payment).

In numerous countries, an appreciable amount of non-programme examinations for early detection of cancer may also be performed in a diagnostic or clinical context (commonly referred to as "grey," "wild," or "opportunistic" screening). Such examinations may or may not be performed according to the public screening policy, if one exists. For example, some apparently healthy women receiving non-programme mammography in a clinical setting may be older or younger than the recommended age for mammography screening. Also, their mammographic examinations may or may not be publically financed, depending on the rules for reimbursement and/or payment of diagnostic mammography in the respective Member State. It is generally not possible to distinguish "grey" screening examinations from solely diagnostic examinations in official statistics. For the purposes of the present report, "grey"

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Screening Programme in Ireland, and the national Ministry of Public Health and the National Management Unit for Screening Programmes in Romania.

screening examinations are not considered to entail screening performed in the context of a programme.

### **2.3.1.2 Organised screening**

"Organised" programmes for delivery of screening services generally require a higher degree of programme management than the minimum expected to distinguish between "programme screening" as opposed to "non-programme screening". In an "organised" programme, in addition to the targeted population group(s), the screening test and the screening interval(s), the programme policy generally also specifies other procedures and provides for a team at the national or regional level which is responsible for implementing the policy, i.e., for coordinating the delivery of the screening services, maintaining requisite quality, and reporting on performance and results. Such elements generally provide for supervision and monitoring of most steps in the screening process, as well as comprehensive guidelines and rules defining standard operating procedures. In addition, a quality assurance structure is required and a means of ascertaining the population burden of the disease should be available [14, 15, 19, 20].

### **2.3.1.3 Population-based screening**

Population-based screening means that in each round of screening the persons in the eligible target population in the area served by a programme are individually identified and personally invited to attend screening. Population-based screening programmes generally require a high degree of organisation 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.<sup>12</sup>

## **2.3.2 Country implementation status**

The present report differentiates between Member States in which cancer screening programmes are lacking and those in which programmes have been or are currently being implemented. Note that in those Member States in which cancer screening programmes are lacking, substantial volumes of non-programme screening may be occurring. Member States with cancer screening programmes may be further differentiated as to whether the screening programmes are population-based or non-population-based. Furthermore, public policy may aim to implement screening nationwide or only in certain regions. Finally, in the case of population-based screening, nationwide or regional programme implementation may be in various stages of development: planning phase, pilot phase, rollout ongoing, or rollout complete (i.e. programme is fully established). For rollout to be complete at least ca. 90% of the eligible target population in the respective region or country should have received at least one personal invitation to attend the screening programme, and all elements of the screening services should be fully functional in order to assure that every eligible person has an equal opportunity to participate in screening. In some cases, implementation status may be mixed because the country is in a phase of transition from one type of programme to another (i.e., from non-population-based to population-based programmes) or because both types of programmes exist in various regions. When data on the volume of invitations was not available which confirmed the plausibility of programmes considered to be completely rolled out by data providers, confirmation that the volume criteria were fulfilled was sought from official or authoritative sources.

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<sup>12</sup> Particularly in cervical cancer screening programmes with intervals of three or more years, some population-based programmes only individually invite non-attenders.

### 3 Quantitative description of screening implementation in the EU Member States

The most recently available quantitative data on implementation of breast, cervical and colorectal cancer screening programmes in the EU is presented in Figs. 3 - 7 and Tables 3 - 5. To indicate the extent to which screening programmes have been or currently are being established, the numbers of persons and the respective proportions of the EU population targeted for screening are shown for relevant age ranges of women and men in the individual Member States and in the EU as a whole. For breast cancer screening using mammography and colorectal cancer screening using the faecal occult blood test, proportions of the target populations in the EU are calculated based on the age ranges specified in the Council Recommendation (50-69-year-old women, and 50-74-year-old women and men, respectively). For cervical cancer screening, the proportions are calculated based on the age range which corresponds to the minimum target age range recommended in the recently updated, second edition of the European Guidelines for Quality Assurance in Cervical Cancer Screening (30-60 years, [15]). Data is broken down by the type of screening programme (population-based or non-population-based); whether or not government policy aims for nationwide, or merely regional implementation; and, in the case of population-based screening programmes, the current phase of implementation (in decreasing degree of implementation: complete rollout across a country or region, rollout ongoing, piloting, or planning). For programme definitions see section 2.3.

Due to the national and regional variation in the definition of populations targeted for screening, the dimensions of the screening programmes shown in Tables 3 a – 5 a underestimate somewhat the full volume of screening activities in the EU. Tables 3 b – 5 b therefore present estimates of the full target populations in the various Member States in an entire round of screening, i.e., without adjustment for the duration of a screening round. Furthermore, the number of screening examinations currently performed in a 12-month period is indicated as far as possible based on available data. The programme type and country implementation status reported in Figs. 3 - 5 and Tables 3 a – 5 a refer to the situation in 2007; the respective target population sizes are unadjusted estimates based on the most recently available data, in most cases EUROSTAT<sup>13</sup> data for 1 January 2007 is used. The annual volume of invitations and examinations presented in Tables 3 b - 5 b refer to the most recent calendar year for which data is currently available, in most cases 2006.

#### 3.1 Breast cancer screening

##### 3.1.1 Policy consensus

There is substantial consensus between the Member States and the Council of the European Union in promoting breast cancer screening based on mammography as a public health policy. Programmes were running or being established in at least 26 of the 27 Member States in 2007. Population-based programmes were running or being established in 22 Member States (Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Italy, Luxembourg, Malta, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, and the United Kingdom). Of the five Member States operating non-population-based breast screening programmes based on mammography in 2007 (Austria, Greece, Latvia, Lithuania, and the Slovak Republic), one was also piloting or planning implementation of a nationwide population-based programme (Austria; Fig. 3 a, Table 3 a).

<sup>13</sup> EUROSTAT: Statistical Office of the European Communities

### 3.1.2 Number of persons affected by screening

Large numbers of women are affected by the breast cancer screening policies now being implemented in the EU. Nearly 59 million women in the EU are of the target age for breast cancer screening specified in the Council Recommendation (50-69 years). Nine out of 10 women in this age range in the EU (91 %, 54 million) were targeted for breast cancer screening in 2007 in the 22 Member States which had adopted policies aiming for implementation of population-based screening programmes. Less than one in 10 women in this age group in the EU (6%, 3.7 million) was targeted for breast cancer screening in the five Member States which were running non-population-based screening programmes.<sup>14</sup> If women outside the 50-69-year-old age range are also taken into account, over 64 million women were targeted by breast cancer screening programmes which were running or being established in the EU in 2007 (Fig. 3 a – c, Table 3 a and b).

### 3.1.3 Programme implementation status

A large proportion of the 50-69-year-old women targeted for breast cancer screening in the EU resides in Member States which were still in the process of expanding or establishing population-based breast screening programmes in 2007. Four out of 10 women in this age group in the EU (41%) were targeted for breast cancer screening in the 11 Member States in which nationwide rollout of population-based programmes is complete (Belgium, Cyprus, Estonia, Finland, France, Hungary, Luxembourg, The Netherlands, Spain, Sweden, and the United Kingdom). A slightly higher proportion of the women in this age group in the EU (44.0%) was targeted for breast cancer screening in the seven Member States in which nationwide rollout of population-based programmes was ongoing (Czech Republic, Denmark, Germany, Ireland, Italy, Poland, and Portugal). Under one out of 10 women in this age group in the EU (7%)<sup>15</sup> was targeted by the nationwide population-based breast screening programmes being piloted (Austria, 2%) or planned (Malta, Romania and Slovenia, 5%) in four Member States in 2007 (Fig. 3 a - c, Table 3 a).

### 3.1.4 Variation between Member States

Despite the broad consensus among the Member States on the current priority of establishing breast cancer screening programmes, the way screening programmes are implemented varies across the EU. The greatest uniformity is reflected in the screening interval which only exceeded a two-year period for women in the age group 50-69 years in two of the 26 Member States running or establishing breast screening programmes based on mammography in 2007 (Malta and the United Kingdom, 3 years). Twelve Member States had adopted the target age range specified in the Council Recommendation (50-69 years). Seven Member States did not target the full 50-69-year age range in all regions served by breast screening programmes (Estonia, Hungary, Ireland and Malta) or in some regions (Finland, Spain and the United Kingdom).<sup>16,17</sup> The proportion of the female population in the EU in the age group 50-69 years which was not targeted for breast screening in the aforementioned

<sup>14</sup> Note that two Member States in which non-population-based breast screening programmes were running in 2007, were also piloting or planning nationwide population-based programmes (Austria and Slovenia, respectively). The population-based breast screening programme in Slovenia began nationwide rollout in April, 2008. National cancer control and action plans under development in Greece and Latvia in 2008 also foresee transitions to population-based breast cancer screening. Adoption of the plans in Latvia is foreseen in October, 2008. Breast cancer screening will also be dealt with in the National Cancer Control Programme under development in Bulgaria.

<sup>15</sup> Proportions are rounded.

<sup>16</sup> In 2007 Finland began rolling out extension of the target age group to cover the entire 50-69-year age range in all regions of the country.

<sup>17</sup> The UK breast screening programmes target women 50-70 years of age (except in Northern Ireland which targets women 50-64 years). In all UK programmes older women can request 3-yearly invitation to screening.

Member States is 2% (Table 3 a). Women below 50 years of age were targeted by eight, and women above 69 years of age were targeted by the same number of Member States running or establishing breast screening programmes in 2007. The narrowest age range targeted for population-based breast cancer screening was 50-59 years, which was practiced nationwide in Estonia and in some regions of Finland and has been adopted for the initial phase of the population-based programme being planned in Malta.<sup>18</sup> The broadest age range targeted for population-based breast screening was 40-74 years, which was practiced in several regions in Sweden in 2007 (Tab. 3 b).<sup>19</sup>

### **3.1.5 Volume of programme screening**

The data available for the present report provides an incomplete picture of the current volume of breast screening programmes in the EU. The total numbers of women personally invited to, and attending screening programmes in a one-year period shown in Table 3 b (14 and 9 million, respectively) neither include women from the regionally organized, nationwide, population-based programme in Sweden. Nor do they include invitations to the population-based programmes in the Czech Republic and Poland. As for most Member States, the reference year for invitations and examinations for the Czech Republic and Poland is 2006, the year before transition from a non-population-based to a population-based programme with personal invitation started in these Member States. Therefore no invitations are entered in the table for these Member States. The same applies to the population-based programmes in the planning phase in Malta, Romania and Slovenia in 2007. The numbers of screening participants from the non-population-based programmes in Austria, Greece, Latvia and the Slovak Republic are also not currently available. Furthermore, the total volume of screening is increasing rapidly in the group of Member States in which nationwide rollout of screening programmes is ongoing; and the overall target population in these Member States is significant (27 million women). If these factors are taken into account, a conservative estimate would yield approximately 21 million women invited to, and approximately 12 million women attending breast cancer screening programmes in the EU in 2007.

### **3.1.6 Volume of non-programme screening**

The volume of mammography examinations performed outside of publicly mandated screening programmes has been reported for only 8 of the 27 EU Member States (2.8 million examinations annually). The available data is insufficient to estimate the actual volume of non-programme examinations in the EU in 2007, although the number of examinations is likely to be substantially higher.

## **3.2 Cervical cancer screening**

### **3.2.1 Policy consensus**

Cytology-based cervical cancer screening is also widely accepted as a public health policy in the EU. Programmes according to the definitions used in the present report (see section 2.3) are currently running or being established in 25 of the 27 Member states. Compared to the situation with breast cancer screening, programme implementation varies more markedly and there is substantial deviation from the population-based approach recommended by the Council of the European Union. Population-

<sup>18</sup> See previous footnote on Finland.

<sup>19</sup> Until 2007 the breast screening guidelines of the Swedish National Board of Health and Welfare accepted regional variation in the targeted age range for breast cancer screening; the current national guidelines recommend the full 40-74-year age range without exception.



based programmes are currently running or being established in 15 Member States (Denmark, Estonia, Finland, France, Hungary, Ireland, Italy, Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, and the United Kingdom).<sup>20</sup> Non-population-based screening programmes as defined in section 2.3 are running in 12 Member States (Austria, Belgium, Bulgaria, Czech Republic, France, Germany, Greece, Latvia, Lithuania, Luxembourg, Slovak Republic, and Spain), in two of which regional population-based programmes are also currently piloted or established (France and Spain, respectively; Fig. 4 a and b, Table 4 a).

### 3.2.2 Number of persons affected by screening

Significantly larger numbers of women are affected by the cervical cancer screening policies now being implemented in the EU than is the case with breast cancer screening, due to the extended target age range of cervical cancer screening programmes. Nearly 109 million women in the EU are in the age group 30-60 years which corresponds to the minimum age group for cervical cancer screening specified in the currently updated second edition of the European Guidelines for Quality Assurance of Cervical Cancer Screening [15].<sup>21</sup> Five out of 10 women in this age group in the EU (51 %, 55 million) are targeted for cervical cancer screening by the 15 Member States which have adopted policies aiming for implementation of population-based screening programmes. Nearly five out of 10 women in this age group in the EU (47%, 51 million) are targeted for cervical cancer screening in the 12 Member States which have adopted policies aiming for implementation of non-population-based screening programmes. If women outside the 30-60-year-old age range are also taken into account, 146 million women are targeted by cervical cancer screening programmes which are currently running or being established in the EU (Fig. 4 a – c, Table 4 a and b).

### 3.2.3 Programme implementation status

The majority of the 30-60-year-old female population in the EU resides in Member States which have already established cervical cancer screening programmes nationwide. Two out of 10 women aged 30-60 years in the EU (22%) are targeted for cervical cancer screening in seven Member States which have rolled out population-based programmes nationwide (Denmark, Finland, Hungary, Netherlands, Slovenia, Sweden and the United Kingdom). A higher proportion of the women in this age group in the EU (41%) is targeted for cervical cancer screening by the non-population-based programmes established nationwide in 11 other Member states (Austria, Belgium, Bulgaria, Czech Republic, France, Germany, Greece, Latvia, Lithuania, Luxembourg, and the Slovak Republic). Nearly three out of 10 women in this age group in the EU (27%) is targeted by the nationwide population-based cervical screening programmes currently being planned (Ireland and Portugal, 3%), piloted and planned (Romania, 4%), or rolled out (Italy and Poland, 20%) in five Member States. Somewhat less than one in ten women in this age group in the EU (8%) is targeted by regional cervical cancer screening programmes in five Member States, with a non-population-based approach in the established programmes in Spain (7%) and a population-based approach in the established programmes in Ireland and Spain (<1%), in the programme being rolled out in Portugal (<1%), and in the pilot programmes in France (<1%; Fig. 4 a – c, Table 4 a).

<sup>20</sup> In Cyprus an Ad hoc committee is planning a nationwide population-based cervical cancer screening programme for women 30-60 years of age based on cytology.

<sup>21</sup> The current second edition of the European Guidelines for Quality Assurance in Cervical Cancer Screening recommends 30-60 years or 30-65 years as the minimum age group to target for cervical cancer screening.

### 3.2.4 Variation between Member States

The wider variation between the Member States in the way cervical cancer screening is implemented is also evident in programme policies on the duration of the screening interval and the age of women targeted for screening (Table 4 b). A one-year interval between two negative screening tests is the current policy in six member states with cervical screening programmes (Austria, Czech Republic, Germany, Greece, Luxembourg and the Slovak Republic). A two-year screening interval is adopted in one Member State (Bulgaria), and a three-year interval is currently adopted in 14 Member States, nine of which apply this interval to the entire target age group (Belgium, France, Hungary, Italy, Latvia, Lithuania, Poland, Portugal and Slovenia) and five of which also apply a five-year interval to subgroups of participants, depending on age and/or the screening region (Denmark, Ireland, Spain, Sweden and the United Kingdom). A five-year interval is applied to the entire target population in four Member States (Estonia, Finland, Netherlands and Romania).

In all but one of the 25 Member States currently running or establishing cervical cancer screening programmes, the target age group includes at least the age range 30 to 59 years.<sup>22</sup> The lowest age targeted by most screening programmes is 30 years in 5 Member States (Estonia, Finland, Lithuania, the Netherlands, and Spain), 25 years in 10 (Belgium, the Czech Republic, France, Hungary, Ireland, Italy, Poland, Portugal, Romania, and the United Kingdom), 23 years in two (Denmark and Sweden), 20 years in four (Germany, Greece, Latvia and Slovenia) and less than 20 years in three Member States (Austria, Luxembourg and the Slovak Republic). The highest age targeted by most programmes for cervical cancer screening is 59 or 60 years in nine (Denmark, Estonia, Finland, Ireland, Lithuania, The Netherlands, Poland, Spain, and Sweden), 64 or 65 years in nine (Belgium, Bulgaria, France, Hungary, Italy, Portugal, Romania, Slovenia and the United Kingdom), and 69 or 70 years in two Member States (the Czech Republic and Latvia). There is no upper age limit on the target population in five Member States (Austria, Germany, Greece, Luxembourg and the Slovak Republic; Table 4 b).

### 3.2.5 Volume of programme screening

Table 4 b shows the number of women invited to, and attending cervical cancer screening programmes in the EU in a one-year period based on data for 10 and 19 Member states, respectively. The totals in the table (9.3 million invited and 28.6 million screened) do not include women invited to the population-based screening programmes established nationwide in Denmark and Sweden; the pilot population-based programmes in France and Romania, one of the regional population-based screening programmes in the United Kingdom (Scotland), and the regional population-based programmes in Spain. As for most Member States, the reference year for the data from Poland is 2006, the year before transition to a population-based programme with personal invitation in that Member State. Therefore no invitations are entered in the table for Poland. Data on the number of women attending screening is lacking from the population-based nationwide and pilot programmes in Denmark and France, respectively, as well as from the non-population-based programmes in Austria, Greece, the Slovak Republic and most regions in Spain. If these factors are taken into account, a conservative estimate would yield over 17 million women invited to, and approximately 32 million women attending cervical screening programmes in the EU in 2007.

### 3.2.6 Volume of non-programme screening

The volume of cervical cancer screening examinations performed outside of publicly mandated screening programmes has been reported for 10 of the 27 EU Member States (over 9 million examinations annually). The available data is insufficient to estimate the actual volume of non-programme examinations in the EU, although the number of examinations is likely to be substantially higher.

<sup>22</sup> Note regional variation in the targeted age ranges in some member states: the targeted age ranges indicated in the text for Denmark, France, Finland, Spain and the United Kingdom, in particular, apply to most, but not all regions. The youngest age targeted for cervical cancer screening in Bulgaria is 31 years.

### 3.3 Colorectal cancer screening

#### 3.3.1 Policy consensus

Colorectal cancer screening is also widely accepted as a public health policy in the EU. Programmes are currently running or being established in 19 of the 27 Member States. Twelve of the Member States have adopted the population-based approach to programme implementation recommended by the Council of the European Union (Cyprus, Finland, France, Hungary, Italy, Poland, Portugal, Romania, Slovenia, Spain, Sweden and the United Kingdom).<sup>23</sup> Seven Member States have established non-population-based programmes (Austria, Bulgaria, the Czech Republic, Germany, Greece, Latvia, and the Slovak Republic). Compared to the situation with breast and cervical cancer screening in 2007, colorectal cancer screening programmes were running or being established in a smaller number of the Member States, programme implementation was less advanced, and a smaller proportion of the population specified in the Council Recommendation was targeted (Figs. 5 - 7, Table 5 a).

##### 3.3.1.1 Recommended screening method (FOBT)

The screening test for colorectal cancer specified in the Council Recommendation is the faecal occult blood test (FOBT), a non-invasive test taken at home by the screening participant and generally returned by surface mail to a laboratory for processing.<sup>24</sup> Fig. 5 shows the implementation status of the 18 Member States which have adopted the FOBT for use in colorectal cancer screening programmes.

##### 3.3.1.2 Novel screening tests still under evaluation (Endoscopy)

Novel screening tests still under evaluation have been adopted in a limited number of Member States currently running or establishing colorectal cancer screening programmes. The novel screening tests consist in colonoscopy or flexible sigmoidoscopy, i.e., invasive, endoscopic procedures performed by medical personnel. The screening programme in one Member State (Poland) uses only colonoscopy as the screening test. Screening programmes currently running or being established in six other Member States (Austria, Cyprus, Germany, Greece, Italy and the Slovak Republic) employ endoscopic screening tests (either flexible sigmoidoscopy or colonoscopy) as a supplement or an alternative to FOBT (see Fig. 6 and section 3.3.4).<sup>25</sup>

#### 3.3.2 Number of persons affected by screening

Despite the less widespread implementation of colorectal cancer screening programmes compared to breast and cervical cancer screening, very large numbers of individuals are affected by the colorectal cancer screening policies adopted in the EU because both sexes are targeted. In 2007 approximately 136 million women and men in the EU were in the target age group for colorectal cancer screening specified in the Council Recommendation (50-74 years). Over four out of 10 women and men (43 %, 58 million) in this age group in the EU were targeted for colorectal cancer screening in the 12 Member States which have adopted policies aiming for implementation of population-based programmes. Approximately three out of 10 women and men (27%, N=37 million) in this age group in the EU were

<sup>23</sup> In Denmark, the results of an FOBT-based pilot study in 2005-2006 and international findings are being analyzed in a health technology assessment. Based on the HTA the National Board of Health will make a recommendation expected in June 2008 concerning nationwide colorectal screening programme.

In The Netherlands, three pilot studies dealing with FOBT (Amsterdam and Nijmegen), FOBT and FS (Rotterdam) and CS (Maastricht) involving a total of over 30,000 subjects were running in 2007. Results will provide evidence for policy decision on nationwide implementation of screening.

<sup>24</sup> Faecal occult blood tests are designed to detect blood in stool specimens which is not visible to the human eye.

<sup>25</sup> Endoscopic colorectal screening examinations visualize the inside of the colon (large intestine and rectum) using flexible optical instruments. Full colonoscopy permits examination of the entire colon. Flexible sigmoidoscopy permits examination of the rectum and the sigmoid colon.

targeted for colorectal cancer screening in the seven Member States which have adopted policies aiming for implementation of non-population-based programmes. If women and men outside the age range 50-74 years are also taken into account, approximately 106 million individuals were targeted for colorectal cancer screening in the EU in 2007 (Fig. 7 a and b, Table 5 a and b).

### 3.3.3 Programme implementation status

A majority of the 50-74-year-old female and male population in the EU resides in Member States which have already established or are still in the process of rolling out colorectal cancer screening programmes nationwide. More than three out of 10 women and men (34%) in this age group in the EU was targeted for colorectal cancer screening by the population-based programmes currently being rolled out nationwide by five Member States (Finland, France, Italy, Poland and the United Kingdom). Approximately three out of 10 women and men (27%) in this age group in the EU were targeted for colorectal cancer screening by the non-population-based programmes established nationwide by seven Member states (Austria, Bulgaria, Czech Republic, Germany, Greece, Latvia, Slovak Republic). Approximately one out of 10 women and men in this age group in the EU (9%) was targeted by the nationwide population-based colorectal cancer screening programmes which were being piloted (Hungary, 2%) or planned (Cyprus, Portugal, Romania, Slovenia; 6%) by five Member States in 2007. A very small proportion of the 50-74-year-old female and male population in the EU (<1%) is targeted by regional population-based programmes being planned in Sweden and piloted in Spain (Figs. 5 – 7, Table 5 a and b).<sup>26</sup>

### 3.3.4 Variation between Member States

Variation between the Member States in the way colorectal cancer screening is implemented is more pronounced than is the case with breast or cervical cancer screening. Out of the 19 Member States running or establishing colorectal cancer screening programmes in 2007, 12 (Bulgaria, Czech Republic, Finland, France, Hungary, Latvia, Portugal, Romania, Slovenia, Spain, Sweden, and the United Kingdom) have adopted only the non-invasive test specified in the Council Recommendation (FOBT), six (Austria, Cyprus, Germany, Greece, Italy, Slovak Republic) use both the FOBT and an endoscopic test for primary screening, and one (Poland) uses only an endoscopic test (colonoscopy). With the exception of Italy, in which flexible sigmoidoscopy is the endoscopic screening test used in seven loco-regional programmes in 2007, the other Member States with endoscopic programmes have adopted colonoscopy as the primary screening test. In two Member states (Germany and Italy) the FOBT is not provided for persons electing to undergo endoscopic screening; in Austria and Greece, screenees may attend endoscopic and FOBT screening during the same screening round. The two FOBT and endoscopic screening rounds are separate in Cyprus. It is not clear from the available information whether the tests will be mutually exclusive in the programme planned for the Slovak Republic.

Out of 17 Member States for which information on the FOBT screening interval is available, 11 have adopted a 2-year interval for all participants with a negative test result. In two Member States (Austria, and Germany) a 1-year interval applies in some cases. Two Member States (Bulgaria and Latvia) have adopted a 1-year interval. One Member State has adopted a 5-year interval (Greece) and another Member State (Cyprus) plans invitation once in a lifetime to FOBT screening, five years prior to invitation once in a lifetime to colonoscopic screening. In the Italian endoscopic screening programmes invitations to flexible sigmoidoscopy are also issued once in a lifetime. The recommended interval for colonoscopy is 5 years in Greece and 10 years in the four Member States which have adopted endoscopic screening programmes. Due to the upper age limits of the respective target

<sup>26</sup> The population-based colorectal cancer screening programme in the Stockholm County was in the planning phase in 2007 and became operational in January, 2008.

populations, the number of screening colonoscopies is limited to once or twice in a lifetime in Germany and Poland.

The full age range recommended by the Council of the European Union for colorectal cancer screening using the FOBT (50-74 years) was only targeted in 9 Member States in 2007 (Austria, Bulgaria, Czech Republic, France, Germany, Greece, Latvia, Romania and the Slovak Republic). Nine Member States target less than the full age range for FOBT screening (Cyprus, Finland, Hungary, Italy, Portugal, Slovenia, Spain, Sweden, and the United Kingdom).<sup>27</sup> Only two Member States (France and Romania) have adopted a target age range which corresponds exactly to the age range specified in the Council Recommendation. The shortest age range targeted for FOBT screening is in Cyprus, which plans to invite 50-year-old women and men once-in-a-lifetime to FOBT screening, followed five years later by once-in-a-lifetime colonoscopy screening. The youngest age targeted for FOBT screening in the EU in 2007 was 31 years in one Member State (Bulgaria) and 50 years in 16 Member States. Programmes running or being established in only three Member States begin targeting women and men of higher age (Finland, Sweden and the UK).<sup>28</sup>

In 2007 the target ages for endoscopic colorectal cancer screening in average risk persons ranged from the one-year age groups in the two Member States with once-in-a-lifetime screening programmes (55 years in Cyprus and 58 or 60 years in Italy), to age ranges of 15 years or more in the other four Member States with a ten-year screening interval (50-65 years in Poland, 55-74 years in Germany, 50 or more years in Austria and the Slovak Republic) and the single Member State (Greece) with a 5-year interval (50 years and older).

The proportion of the female and male population in the EU in the age group 50-74 years which was not targeted for colorectal cancer screening in the Member States running or establishing colorectal cancer screening programmes was 22% in 2007.

### **3.3.5 Volume of programme screening**

Table 5 b shows the number of women and men personally invited to, and attending colorectal cancer screening programmes in the EU in a one-year period based on data for 7 and 9 Member states, respectively. Five member states with population-based programmes in the planning phase had not yet initiated personal invitations, and examinations in 2007. The totals in the table (5.5 million invited, and 9.9 million screened) do not include persons invited to the population-based screening programme being rolled out in Scotland. Data on the number of women and men attending screening is lacking from the non-population-based programmes in Austria, Bulgaria, Greece, Latvia and the Slovak Republic. Furthermore, the number of personal invitations and the total number of women and men attending screening was rapidly increasing in the five Member States rolling out population-based programmes for a total target population of 46 million women and men. If these factors are taken into account, a conservative estimate would yield over 8 million women and men personally invited to, and over 12 million women and men attending colorectal cancer screening programmes in the EU in 2007. The FOBT was the screening test used in more than 9 out of 10 screening examinations (approximately 94%).

### **3.3.6 Volume of non-programme screening**

The volume of colorectal cancer screening examinations performed outside of publicly mandated screening programmes has been reported for only four of the 27 EU Member States (1.7 million examinations annually in France, Germany, Latvia and Portugal). The available data is insufficient to

<sup>27</sup> Note that the recommended age range for FOBT screening may be of limited relevance in the case of endoscopic colorectal cancer screening.

<sup>28</sup> Note regional variation in the youngest age targeted for FOBT screening in the United Kingdom (Table 5 b).

estimate the actual volume of non-programme examinations in the EU, although the number of examinations is likely to be substantially higher.

## 4 Qualitative information on implementation of cancer screening in the EU Member States

The broad and complex scope of activities involved in establishing and running appropriate and effective cancer screening programmes is reflected in the numerous points grouped under six headings in the Council Recommendation. Twenty-two of the 23 points can be broken down further into 30 specific recommendations incorporated in the Council Recommendation which deal with the manner in which population-based screening programmes are implemented, managed, monitored, and adopted or changed. They have been covered by a total of 31 items in 22 of the 23 questions included in section III of the questionnaire used in the presently reported survey. The first question in section III of the questionnaire dealing specifically with whether or not population-based breast, cervical or colorectal cancer screening has been implemented in a Member State has been covered in chapter 3 and therefore will not be reported here. The remaining qualitative information on adherence to the 30 respective individual recommendations in the Council Recommendation which has been reported in the questionnaires received from 22 Member States (see section 2.2) is summarised below and in Annex 5. Reported deviation from the specific recommendations is pointed out in sections 4.1 to 4.6, which correspond to the headings in the Council Recommendation (cf. Annex 2).

Whereas eight out of 10 Member States reported that they followed at least two out of three specific recommendations dealing with most of the principles in the Council Recommendation, this level of compliance was only reported by 4 out of 10 Member States for specific recommendations dealing with *monitoring* (41%) (cf. section 3 of Annex 2 and items 26 a and b, 27 and 28 of Annex 5) and *scientific evaluation prior to introduction of novel screening tests* (36%) (cf. section 6 of Annex 2 and questions 32 – 36 in Annex 5). Furthermore, a high proportion of the Member States (82%) reported that they follow the recommendation to provide human and financial resources to assure appropriate organisation and quality control (cf. section 1 of Annex 2 and item 18 a of Annex 5). Yet only 41% of the Member States indicated that the resources being provided for these important tasks are satisfactory (cf. item 18 b of Annex 5).

Twenty-five out of 30 of the specific recommendations (83%) were reported to be followed by at least one-half of the Member States which responded to the survey. Somewhat more than one-half of the recommended items (16 out of 30, 53%) were reported to be followed by more than two out three Member States. Most exceptions to this substantial agreement were confined to the specific recommendations in the Council Recommendation dealing with *monitoring screening programmes* and *introduction of novel screening tests* (see sections 4.3 and 4.6).

A notable inconsistency was also evident in the high proportion of the responding Member States (82%) reporting that they follow the specific recommendation 1 (e) to *make available human and financial resources to assure appropriate organisation and quality control*, on the one hand, and the lower proportion of responding Member States (41%), on the other hand, which indicated that the *resources being provided* for these important tasks *are satisfactory* (see section 4.1 and items 18 a and 18 b in Annex 5).

## 4.1 Implementation of cancer screening programmes

Seven out of nine (nearly 80%) of the specific recommendations in the first section of the Council Recommendation, dealing specifically with establishing screening programmes, were reported to be followed by at least two out of three Member States.

In addition to the comparatively low proportion of responding Member States (41%) which considered the level of resources they provide for organisation and quality control of screening programmes to be satisfactory, comparatively low agreement with the Council Recommendation (50%) was only reported for one other specific recommendation in this section: *assessment of side-effects and cost-effects of screening prior to ...decisions on implementation of cancer screening programmes...*

## 4.2 Registration and management of screening data

The specific recommendations in the Council Recommendation dealing with registration and management of screening data were reported to be followed by very large proportions of the responding Member States. Eighteen out of 22 (82%) used centralised data systems and call/recall systems for running programmes and for inviting all targeted persons, respectively. Twenty out of 22 (91%) responding Member States reported that data is collected, managed and evaluated not just on screening results, but also on assessment of persons with positive screening results and on diagnosis. The same high conformity was reported for data handling in full accordance with European data protection legislation, particularly as it applies to personal health data, prior to implementing cancer screening programmes.

## 4.3 Monitoring

Although a majority of the responding Member States indicated that they comply with two of the three specific recommendations in the section of the Council Recommendation dealing with monitoring screening programmes, compliance was substantially lower than for most items in all other sections, except section 6.

With regard to specific recommendation 3 (a) in the Council Recommendation, only 55% of the responding Member States reported that the *process and outcome of organised screening is monitored regularly by an independent peer review* and 59% indicated that the *results are reported quickly to the general public and to screening staff*. The lower proportions of responding Member States performing such monitoring reflect, among other things, the limited applicability of the respective questions in the EU survey to Member States in which population-based cancer screening programmes have not been initiated. The comparatively very low proportion of Member States which reported that *national cancer registries monitor screening programmes* (45%) can only be explained to a limited extent by the fact that other institutions are primarily responsible for screening monitoring although the responsible institutions, in turn, also make use of cancer registry data.

## 4.4 Training

Very high compliance is reported for section 4 of the Council Recommendation dealing with *training*. Twenty out of 22 responding Member States (91%) reported that screening programme personnel is adequately trained at all levels to ensure that they are able to deliver high quality screening. However, the global nature of the single question posed in this category on the questionnaire suggests that the results should be interpreted with caution.

## 4.5 Compliance

Very high proportions of the Member States also indicated that they adhere to section 5 of the Council Recommendation. Twenty out of 22 responding Member States (91%) reported that *a high level of compliance is sought from the eligible population when organised screening is offered*. Eighteen out of 22 responding Member States (82%) reported that action is taken to ensure equal access to screening, taking due account of the possible need to target particular socio-economic groups.

## 4.6 Introduction of novel screening tests

Approximately only one-half of the 22 responding Member States (50%) reported adherence to the respective specific recommendations in section 6 of the Council Recommendation dealing with *introduction of novel screening tests taking into account international research results*. The only specific recommendation to which a substantial proportion of Member States (77%) indicated compliance was 6 (a): *implement new cancer screening tests in routine health care only after they have been evaluated in randomised controlled trials*. Fourteen of the responding Member States (64%) indicated that they perform trials prior to implementation of a new screening test on at least one of the topics (*treatment outcomes, clinical outcomes, side-effects, morbidity, and quality of life*) specifically recommended in section 6 (b) of the Council Recommendation, whereby little variation was evident in the topic of investigation (41% to 55%). Similar proportions of the responding Member States (41% to 55%) indicated that they comply with the other specific recommendations in section 6 dealing, for example, with such aspects as (c) *pooling of trial results from representative settings in assessing the level of evidence* and (d) *other relevant aspects in evaluating evidence on new screening tests, such as cost-effectiveness in different health care systems*, and (e) *consideration of modification of existing screening tests based on validation in routine health care, possibly using other epidemiologically validated surrogate endpoints* (cf. Annex 5).

Five of the six responding Member States with the largest target populations (France, Germany, Italy, Spain and the United Kingdom) indicated full or nearly full compliance with all of the specific recommendations in this section of the Council Recommendation. Although most of the responding Member States with substantially smaller target populations reported little or no compliance with any specific recommendations in this section except (a) *implementation of new screening tests only after evaluations in randomized controlled trials*, some Member States with significantly smaller target populations also indicated that they comply with most or all recommendations (Czech Republic, Netherlands, Slovenia and Sweden).

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<sup>29</sup> EU guidelines for quality assurance of colorectal cancer screening are currently being developed, and EU guidelines for breast and cervical cancer screening are currently being updated in projects coordinated at the International Agency for Research on Cancer and co-funded by the EU Public Health programme (no. 2005317, Development of European Guidelines for quality assurance of colorectal cancer screening; and no. 2006322, European cooperation on development and implementation of cancer screening and prevention guidelines).



## **5 Discussion**

### **5.1 Scope of the first report on implementation of the Council Recommendation on cancer screening**

The present report provides an overview of the extent to which the EU Member States have adopted the policies advocated in the Recommendation of the Council of the European Union of 2 December 2003 on Cancer Screening. The Council Recommendation comprises a catalogue of twenty-three points, 22 of which can be broken down into 30 specific items, with special relevance to efforts aimed at achieving and maintaining an appropriate balance between benefit and harm of screening large numbers of individuals of average risk in the population. Given the number and complexity of the numerous points, and the current lack of resources which would be required to objectively analyze and compare the quality of cancer screening programmes in the EU, no attempt is made to measure the performance of screening programmes for this initial report. It is recognised, however, that the population-based approach is the fundamental principle which is recommended by the Council and which provides the organisational, professional and scientific framework for implementing and continuously improving cancer screening programmes of appropriate quality. For the present overview, data has therefore been collected on the type and implementation status of screening programmes currently running or being established in the Member States.

In light of the relatively short duration of time which has expired since adoption of the Council Recommendation, on the one hand, and the end of the presently reported period (in most cases the end of 2007) on the other hand, the catalogue of evidence-based screening tests and procedures currently recommended by the Council has not been systematically reviewed for the preparation of the present report. Current efforts in the European Cancer Network to develop and update European quality assurance guidelines for breast, cervical and colorectal cancer screening, have not yet indicated a need for changes in the catalogue of recommended screening tests.<sup>27</sup> However, relevant developments may be forthcoming in the near future. A systematic review is therefore recommended prior to consideration of any changes in the current Council Recommendation.

### **5.2 Impact of the Council Recommendation on screening policies in the EU Member States**

The experience in the cancer screening networks established under the Europe Against Cancer Programmes has shown that scientific investigation and piloting prior to nationwide rollout can provide information essential to effective programme implementation [e.g., 32, 41, 44]. Furthermore, a long-term translational phase is essential to successfully plan, pilot and rollout population-based cancer screening programmes across an entire country, and particularly also across several countries. The time frame depends, to a large extent, on the professional and organisational capacity which must be developed to successfully perform, monitor and evaluate high quality services integrating all steps in the screening process. This activity not only entails coordination of complex communication and training, but also integration of multidisciplinary teams into the diagnosis and treatment of screen-detected lesions, and integration of cancer registration and cancer registries into the monitoring and evaluation of programme performance. Even in countries with relatively small target populations, the magnitude of the task can be substantial, compared to initially available resources. Successful preparation and completion of the nationwide implementation process may require ten years or more.

It is for this reason that the full impact of the Council Recommendation on the implementation of breast, cervical and colorectal cancer screening programmes in the EU could not be assessed from

data collected for the present report on the time period up to the end of 2007. Nevertheless, the present report documents considerable activities in the EU Member States aimed at following through on the Council Recommendation on Cancer Screening. The non-exhaustive list in Annex 4 includes over 70 complex actions in the 27 EU Member States conducted since 2003, the year in which the Council Recommendation was adopted. These actions have aimed at implementing or improving breast (N=30), cervical (N=22), or colorectal (N=25) cancer screening programmes in particular or have facilitated implementation of screening in general (N=10). Although these actions have been taken as a result of decisions at the national or regional level, and many actions were set in motion prior to adoption of the Council Recommendation, the discussion leading up to adoption of the Recommendation and the pan-European exchange between policy makers and experts stimulated by adoption of this Community health policy are likely to have had a positive impact on the implementation of many of the respective actions.

Furthermore, the large numbers of EU Member States which were running or establishing population-based breast, cervical and colorectal cancer screening programmes in 2007 (N=22, 17, and 12, respectively) indicate that four years after adoption of the Council Recommendation there was substantial agreement between the Member States in the enlarged EU and the Council on the health policy priority of establishing cancer screening programmes of appropriate quality. The scale of these activities underlines the substantial impact which actions at the Community level can have on the health of Europe's citizens.

Only limited data is available from the literature which could shed additional light on the impact of the Council Recommendation. Comparison with the present report is impaired by differences in data sources and methodology of data collection, as well as by differences in definitions of screening programmes. The present report indicates that breast cancer screening programmes were running or being established in 26 of the 27 EU Member States in 2007. Population-based programmes were running or being established in 22 Member States (section 3.1). The most recently available comparable data were collected by the International Agency for Research on Cancer in 2002 during preparation of the IARC handbook on cancer prevention dealing with breast cancer screening [19], and in surveys conducted by the International Breast Screening Network (IBSN) sponsored by the National Cancer Institute in the USA in 1998 and 2002 [21, 23]. The IBSN surveys reported on characteristics of population-based screening programmes in 20 and 23 countries, including 9 and 10 current EU Member States respectively. The IARC handbook reported that in 2002 organised breast screening programmes were running or being established in 15 current EU Member States, six of which had nationwide (Finland, France, Luxembourg, The Netherlands, Sweden and the United Kingdom) and six of which had regionally limited programmes (Belgium, Denmark, Ireland, Italy, Portugal and Spain). Pilot programmes were reported in three current Member States (Greece, Germany, Hungary).

Compared to the available data for 2002, quite substantial progress has been made in further implementation of population-based breast screening programmes in the EU. Eight additional Member States were running or establishing population-based programmes in 2007 (Austria, Cyprus, Czech Republic, Estonia, Malta, Poland, Romania, Slovenia). Nationwide rollout of population-based screening is currently complete in two of these Member States (Cyprus and Estonia). Moreover, one of the three Member States which were piloting breast screening programmes in 2002 has completed nationwide rollout (Hungary), and another Member State (Germany) is currently in an advanced stage of nationwide rollout. The same applies to a number of Member States which in 2002 were reported to have regionally limited, organised programmes (Belgium, Ireland, Italy and Portugal). Nationwide rollout has also been completed in Spain.

The presently reported data indicate that cervical cancer screening programmes were running or being established in 25 of the 27 EU Member States in 2007 (section 3.2). A questionnaire survey conducted by the Epidemiology Working Group of the European Cervical Cancer Screening Network and the International Agency for Research on Cancer between August and December 2003 docu-

mented a lesser number (N=14) of the current EU Member States in which national, regional or pilot cervical cancer screening programmes had been established prior to 2003 (Czech Republic, Denmark, Finland, France, Germany, Hungary, Italy, Lithuania, Luxembourg, The Netherlands, Slovenia, Spain, Sweden, the United Kingdom) [3]. In one other Member State (Slovak Republic) a screening programme was planned but not yet implemented in 2003; in two of the aforementioned Member States, the status changed from pilot to national programme (Hungary) or from non-population-based to population-based programme (Slovenia) in 2003. These initiatives presumably benefited from the support at the Community level for implementation of cervical cancer screening programmes expressed in the Council Recommendation and from the international and pan-European discussions leading up to adoption of the Council Recommendation [e.g., 1, 8]. The data base in the 2003 survey (N=20 countries) did not cover all of the current EU Member States because only countries or regions were included which met eligibility criteria of mortality and/or incidence which permitted assessment of cervical cancer trends.

The present report shows that 19 Member States are were running or establishing colorectal cancer screening programmes in 2007 (section 3.3). The respective number of current Member States reported in an international survey conducted in 2003 and 2004 was much lower (N=6). The survey documented 35 colorectal cancer screening initiatives in 17 countries as of May 2004 [7]. National or regional programmes were only reported for the Czech Republic, Italy and Poland, and pilot projects were found in France, Italy, Spain and the United Kingdom. The authors of the international survey acknowledged that some initiatives world-wide were not covered. A further survey of 40 national gastroenterology societies between 2004 and 2006 indicated that 13 countries, 12 of which are EU Member States (Austria, Bulgaria, Czech Republic, Finland, France, Germany, Hungary, Italy, Luxembourg, Poland, Slovak Republic, United Kingdom) were operating a colorectal cancer screening programme [10]. Both of the aforementioned surveys were consistent with the current results showing a preponderance of FOBT-based as opposed to endoscopy-based colorectal cancer screening programmes in the EU.

Although the above-mentioned, published reports must be interpreted with caution, they consistently show a markedly lower degree of screening programme implementation in the EU prior to adoption of the Council Recommendation than currently is the case. These results are in agreement with the notion that the Council Recommendation has had a positive impact on implementation of breast, cervical and colorectal cancer screening programmes in the EU. The positive experience with the Council Recommendation on Cancer Screening in encouraging successful implementation of complex population-based programmes reaching large segments of the European population, and the success of these programmes in providing highly specialized multidisciplinary services integrating a broad range of health care providers, regulatory agencies and other institutions should be taken into account in future efforts to improve the control of cancer and other chronic disease in the EU.

### **5.3 Current disparity in implementation of cancer screening in the EU**

Despite the wide support for cancer screening programmes which is evident in the EU four years after adoption of the Council Recommendation it should be recognised that there is still substantial disparity between the Member States in implementation of cancer screening. This is reflected in the numbers of Member States in which nationwide rollout of population-based screening programmes was still ongoing at the end of 2007, or had yet to begin because breast, cervical and colorectal screening programmes were regionally limited or only in the piloting or planning phase (N=11, 8 and 12, respectively). Furthermore, non-population-based breast, cervical and colorectal cancer screening programmes were still conducted in several Member States (N=5, 12 and 7, respectively) and no programme implementation of any kind was known or planned in a number of Member States (N=1, 2, and 8, respectively).

The social and economic implications and the potential for further improvement in the current implementation status of cancer screening programmes are also reflected in the estimated overall number of screening examinations performed in the EU in 2007 (approximately 55 million per year). Even though numerous screening programmes are still far from the level of activity which can be expected in the future, the current volume already exceeds half a billion screening examinations in the EU over a 10-year period. Given the large number of healthy individuals attending screening, even small improvements in effectiveness and efficiency can have a substantial impact on overall performance, and on the overall balance between benefit and harm, and between benefit and cost of screening.

The importance of continued efforts to improve cancer screening in the EU is illustrated by the fact that, despite the large numbers of persons already attending screening programmes, the current annual volume is less than one-half of the minimum annual number of examinations that would be expected if the screening tests specified in the Council Recommendation were available to, and were utilised by all EU citizens of respective age: approximately 125 million examinations per year for breast (30 million), cervical (27 million) and colorectal (68 million) cancer screening.<sup>30</sup>

The data collected for the present report do not permit reliable estimation of the total costs of screening programmes in the EU. It should be kept in mind, however, that in most Member States, the cost of performing a screening test (i.e., not including additional costs for diagnosis and treatment of screen-detected lesions) is in the two-digit euro range.

#### **5.4 Community added value through transition to population-based screening programmes**

A potential source of resources for further improvement could be mobilised by replacing the non-population-based programmes in the EU which currently provide ca. 32 million screening examinations per year) with population-based programmes. The experience in the European cancer screening networks has shown that provision of screening services in a non-population-based setting is generally inefficient and of limited effectiveness and should be discouraged. Non-population-based screening, depends on the initiative of the individual woman or her doctor and is often characterised by high coverage in selected parts of the population which are screened too frequently, coexisting with a low coverage in other population groups with less socioeconomic status, and heterogeneous quality, resulting in limited effectiveness and poor cost-effectiveness [2, 3, 5, 15, 39]. The same applies to "wild" screening outside of any programme, the current volume of which could not be reliably estimated for the present report, but which may also be assumed to be substantial.

The population-based approach with personal invitation of each eligible person in the target population also provides the organisational framework for improving the equity and accessibility of screening programmes by facilitating effective use of call/recall systems. Substantial community added value can therefore be expected from replacing current non-population-based screening programmes with more efficient population-based programmes following the EU guidelines.

More than half of the approximately 55 million screening examinations performed in 2007 in the EU were provided for cervical cancer screening (32 million). The lion's share of these examinations was provided by non-population-based programmes (75%, 24 million). In most of these non-population-based programmes the ages at which women are eligible to attend screening substantially exceed the minimum age range recommended by the EU Guidelines (30-60 years), and the screening interval in

<sup>30</sup> Based on minimum respective age-range of target populations and average screening intervals for breast (50-69, 2-yearly), cervical (30-60, 4-yearly), and colorectal cancer screening (50-74, 2-yearly).

these programmes is frequently much shorter than the 3-5-year interval recommended in the EU guidelines. Such relatively short screening intervals are not justified in light of present knowledge of the natural history of cervical cancer, particularly the duration of the precancerous stage [3]. As a result, women attending these screening programmes may be examined many times more often than in population-based programmes but without appropriate additional benefit despite the potential harm and additional cost of screening resulting from the higher number of examinations in a lifetime.

## 5.5 Barriers to and prospects for further progress

The qualitative data collected from 22 Member States for the present report could not be validated with the available resources. They provide, however, an insight into current barriers to implementation of the Council Recommendation. Whereas a large majority of the Member States indicated that they already adhere to or intend to adhere to many of the items in the Council Recommendation, exceptions to this substantial agreement were reported for a number of points dealing with *monitoring screening programmes* and scientific investigation relevant to *introduction of novel screening tests*. In notable contrast to the high proportion of Member States (82%) reporting that they follow the recommendation to *make available human and financial resources to assure appropriate organisation and quality control*, only a minority of the responding Member States (41%) indicated that the *resources being provided* for these important tasks *are satisfactory*.<sup>31</sup>

Key initial results of the present report were discussed at the recent Slovenian EU Presidency Conference held on 6-7 February 2008 in Brdo.<sup>32</sup> The attending policymakers and experts in cancer prevention from across the EU noted the substantial volume of breast, cervical and colorectal cancer screening examinations which will be performed in the EU over the next 10 years. The great potential of this effort to reduce the burden of disease through earlier detection and treatment of cancer was widely acknowledged. However, a much larger volume of screening (more than one billion examinations over a 10-year period) would be required to make effective breast, cervical and colorectal cancer screening available in all Member States. Furthermore, due to a lack of reliably collected and regularly reported information, too little is currently known at the Community level about the quality, effectiveness and cost-effectiveness of this activity.

Despite the need for further efforts, the substantial progress made in the implementation of cancer screening programmes in the EU since adoption of the Council Recommendation on Cancer Screening should not be overlooked. The positive experience with the Council Recommendation in encouraging successful implementation of complex population-based programmes reaching large segments of the European population with highly specialized multidisciplinary services integrating a broad range of health care providers, regulators and other institutions should be taken into account in future efforts to improve the control of cancer and other chronic disease in the EU.

In particular, future Community efforts should recognize the importance of a translational phase permitting appropriate integration of new preventive or therapeutic strategies into existing health care systems and programmes. Furthermore, the effectiveness of appropriately integrated strategies under "real life" conditions should be demonstrated before new programmes or modifications of existing

<sup>31</sup> In several cases, no response was provided to individual items in these categories. In such cases, it is unclear whether the lack of response reflects a negative answer, or the perception of the person filling in the survey questionnaire that the respective question was of limited relevance or applicability.

<sup>32</sup> *The increasing burden of cancer - How can it be reduced?* European conference held in Brdo, Slovenia, 6-8 February 2008, under the auspices of the Slovenian Presidency of the Council of the European Union

programmes are considered to be fully established. Pan-European collaboration in such translational efforts has the potential to accelerate health improvements across the EU by avoiding unnecessary duplication of effort and by focusing available resources on common problems.

## 5.6 Recommendations

Representatives of national health authorities and experts in cancer prevention from across the EU also discussed recommendations in light of the previous experience with implementation of the Council Recommendation at the pan-European conference held in Brdo in February, 2008, in the framework of the Slovenian Presidency of the Council of the European Union.<sup>33</sup> There was wide consensus that regular, systematic monitoring, evaluation and EU-wide status reporting would promote the exchange of information on successful developments between Member States and would identify weak points requiring improvement. Software tools for uniform monitoring of breast screening programmes across the EU have been developed in the European Cancer Network and their feasibility in comparing data between programmes has been demonstrated. Further efforts should be undertaken to make such tools available for cervical and colorectal cancer screening and to promote their routine use.<sup>34</sup>

There was also broad consensus between policymakers and experts attending the Slovenian EU Presidency Conference that the present situation underlines the need for further efforts at the European level to facilitate implementation of the Council Recommendation.

The experts and policymakers also concluded that substantial support will be needed for collaboration and cooperation between Member States and at the Community level in providing professional, organisational and scientific assistance to those Member States seeking to establish and improve population-based cancer screening programmes. There was consensus that EU structural funds should be one of the sources of resources for such assistance. Furthermore, a process should be identified to improve accessibility of these funds for programmes in need of support

The pan-European consensus documented in this forum is in agreement with current Commission policies to promote and improve the safety, effectiveness and cost-effectiveness of health services in the EU. Key to the future success of these efforts will be development and implementation of an objective and reliable EU-wide accreditation/certification scheme for cancer screening, diagnosis and management. This would stimulate quality improvement and would recognise those services which fulfil the European quality assurance guidelines.

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<sup>33</sup> See footnote 32.

<sup>34</sup> **SEED** – the European Screening Evaluation Database ([www.cpo.it/seed](http://www.cpo.it/seed)). This prototype web database and audit system based on individual records is capable of calculating at a local or regional level a number of process and early impact indicators of breast cancer screening.. SEED should contribute to the standardisation of screening evaluation in Europe by facilitating joint data collection and multi-centre comparisons, and by helping individual programmes to build their documentation system and to evaluate their own performance in a standard way.

**QT** – Audit system on Quality of breast cancer diagnosis and Treatment ([www.cpo.it/qt](http://www.cpo.it/qt)). This is a Microsoft Access individual records database which is available in six languages. A web version is being piloted. QT is kept updated with guidelines and allows recording of data on all women recalled for assessment in a screening programme or assessed for clinical suspicion. QT has been designed for and is being used by clinical breast units for monitoring diagnosis and treatment of breast lesions in symptomatic as well as asymptomatic women. Furthermore, it can assist cancer registries for high resolution population studies. Within the EUNICE project, a web database for aggregated data collection and the monitoring of European breast cancer screening performance parameters is currently being piloted ([www.qtweb.it/eunice](http://www.qtweb.it/eunice)).

## 6 Conclusions

The adoption of the Council Recommendation on Cancer Screening in 2003 is a prime example of the way in which agreement of joint priorities and principles of health policy at the Community level can stimulate EU-wide implementation of programmes aiming to improve the health of the European population. Four years after its adoption, most Member States have acted on the Council Recommendation, and most Member States intend to undertake further action where implementation is not yet complete.

The positive experience with the Council Recommendation in encouraging successful implementation of complex population-based programmes reaching large segments of the European population should be taken into account in future efforts to improve the control of cancer and other chronic disease in Europe.

Despite the broad consensus at the Community level and among the Member States in the expanded EU on the importance of population-based screening as a tool of cancer control, considerable effort will be required over the coming years to successfully implement current policies and to overcome existing barriers to successful programme implementation.

Even though the number of individuals currently attending cancer screening programmes in the EU is still far from the level which can be achieved in the future, the expenditure in human and financial resources is already considerable. The scale of these resources and the challenge of maintaining an appropriate balance between benefit and harm of screening call for an adequate strategy at the Community level to ensure that appropriate professional, technical and scientific support is available to Member States seeking to close the current gap between the status quo, and the potential of future expansion of evidence-based screening programmes to improve the health of the population.

Adequate provision should also be made for the translational phase of investigation, planning, prioritising, and piloting prior to nationwide rollout of programmes or programme modifications, and for research on innovative screening tests and on the impact of screening in the population. This particularly holds for potentially more effective methods than the currently recommended test for colorectal cancer screening (FOBT) and for new methods of testing and complementary preventive approaches (such as HPV vaccination and testing for primary and secondary prevention of cervical cancer). New preventive strategies should neither be recommended for routine use in population-based programmes nor in clinical practice until efficacy, benefits, and adverse effects, as well as cost-effectiveness, have been adequately investigated.

Increased exchange of information and collaboration between Member States, and professional, organisational and scientific support for Member States seeking to establish or improve population-based screening programmes will also be required to successfully implement the Community strategy.

Assistance should be based on an appropriate technical and expert advisory capacity, as well as regular, systematic monitoring, evaluation and EU-wide status reporting on implementation of cancer screening programmes.

Development and piloting of an EU-wide accreditation/certification scheme mandated by the Member States and based on EU quality assurance guidelines would encourage programmes throughout the EU to take the initiative to continuously improve performance and would help consumers to recognise which services achieve the EU standards.

Given the current need for professional, organisational and scientific support for Member States seeking to implement or improve cancer screening programmes, adequate resources for appropriate Community actions are vital.

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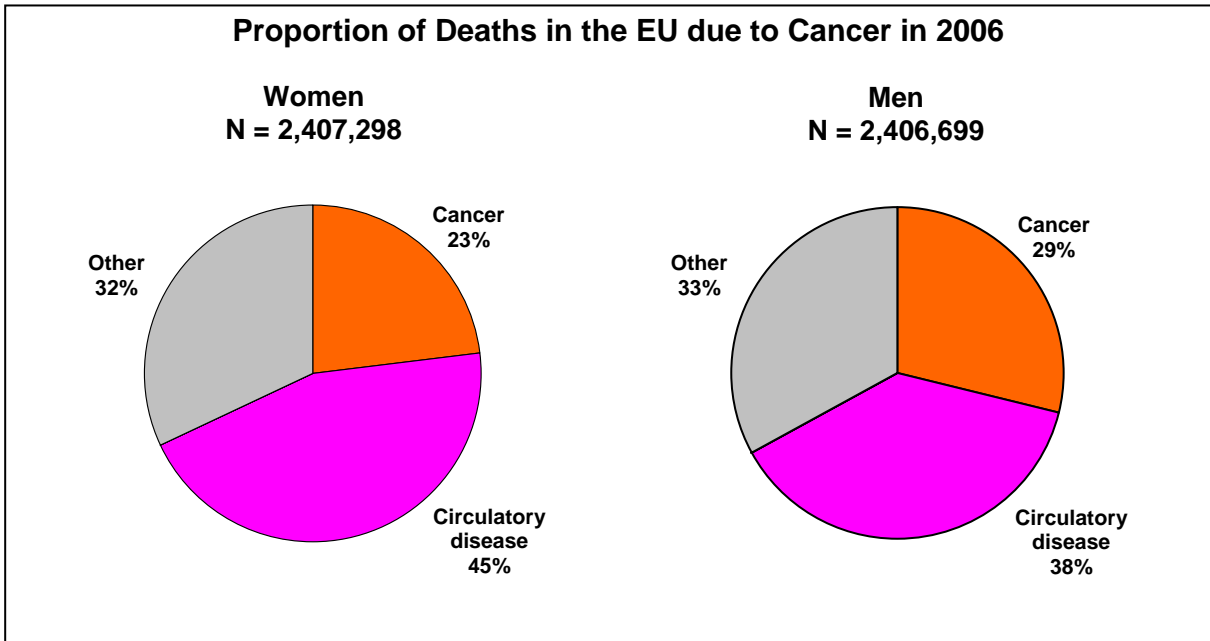
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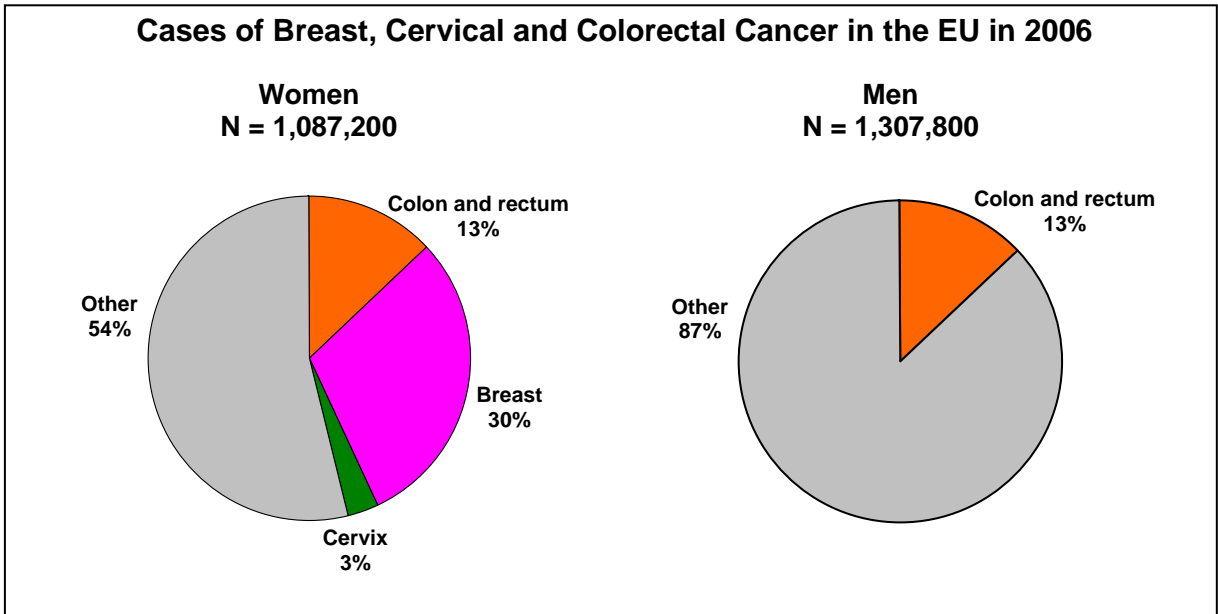


# Figures



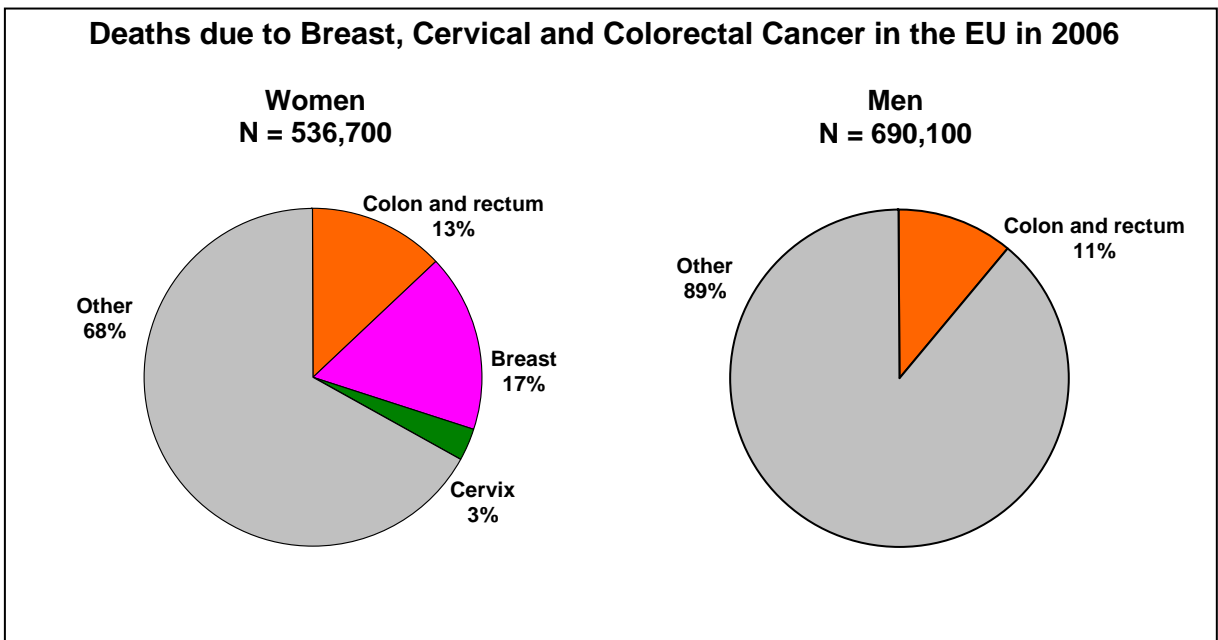
**Figure 1 a.** Proportion of deaths in the European Union in 2006 by gender and major cause of death (deaths due to cancer not including non-melanotic skin cancer, proportions in percent).

Source: EUROSTAT 2007



**Figure 1 b.** Proportion of cancer cases in the European Union in 2006 by gender and type of cancer (except non-melanotic skin cancer, proportions in percent).

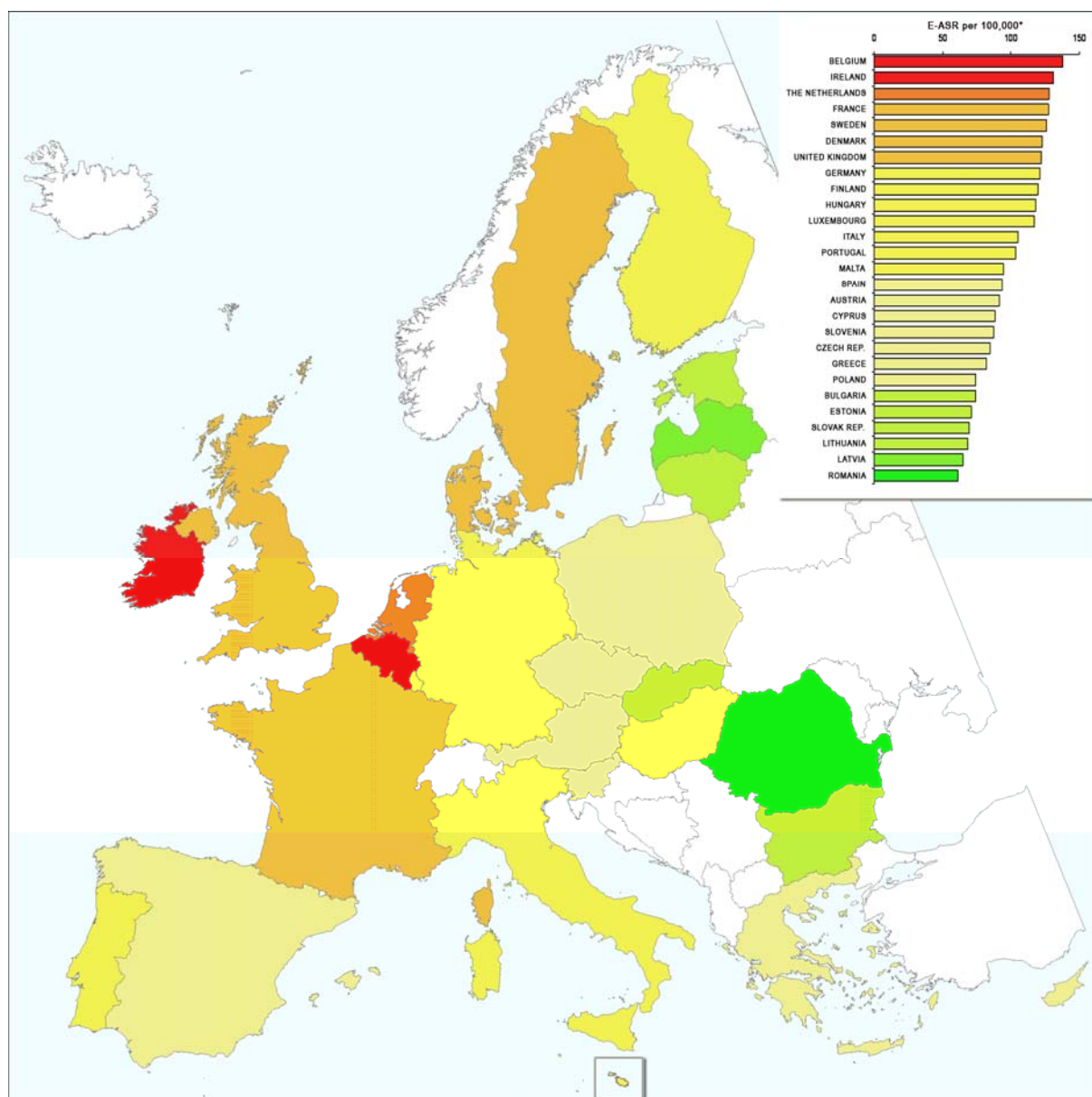
Source: incidence estimates by IARC adapted from: Arbyn M, Autier P, Ferlay J (2007) *Ann Oncol* 18: 1423-1425; Arbyn M, Raifu AO, Autier P, Ferlay J (2007) *Ann Oncol* 18: 1708-1715; Boyle P, Ferlay J (2005) *Ann Oncol* 16: 481-488; Ferlay J et al. (2007) *Ann Oncol* 18: 581-592.



**Figure 1 c.** Proportion of cancer deaths in the European Union in 2006 by gender and type of cancer (except non-melanotic skin cancer, proportions in percent). Percentages for women do not add up due to rounding.

Source: mortality estimates by IARC (2007) adapted from: Arbyn M, Autier P, Ferlay J (2007) *Ann Oncol* 18: 1423-1425; Arbyn M, Raifu AO, Autier P, Ferlay J (2007) *Ann Oncol* 18: 1708-1715; Boyle P, Ferlay J (2005) *Ann Oncol* 16: 481-488; Ferlay J et al. (2007) *Ann Oncol* 18: 581-592 .

## Breast cancer incidence in the EU Member States 2006



**Figure 2 a.** Age-standardised rates of incidence of breast cancer (cases per 100,000 women-years) in the 27 Member States of the European Union, ranked by increasing incidence, estimates for 2006 (direct standardisation using the European reference population)

Cutpoints for color scale from green (lowest incidence) to yellow, brown and red (highest incidence) based on distribution of incidence among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles): 64.8, 68.7, 74.1, 94.5, 122.2, 128.0, 131.4 cases per 100,000

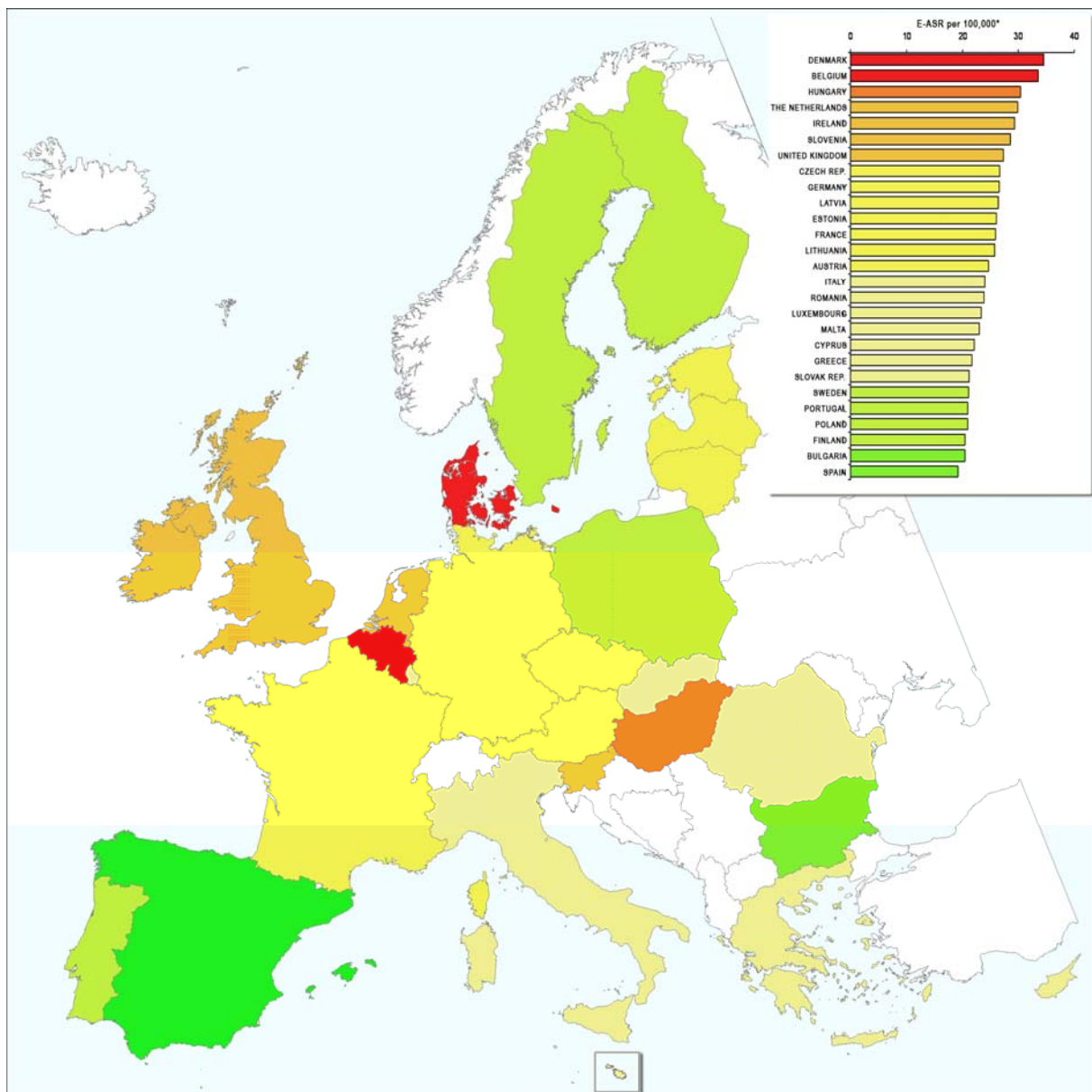
Lowest incidence in Romania (61.2/100,000) and Latvia (64.8/100,000)

Highest incidence in Belgium (137.8/100,000) and Ireland (131.4/100,000)

Source: IARC (ECN and EUNICE projects, 2007); Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P (2007) Ann Oncol 18: 581-592



## Breast cancer mortality in the EU Member States 2006



**Figure 2 b.** Age-standardised rates of mortality of breast cancer (deaths per 100,000 women-years) in the 27 Member States of the European Union, ranked by increasing mortality, estimates for 2006 (direct standardisation using the European reference population)

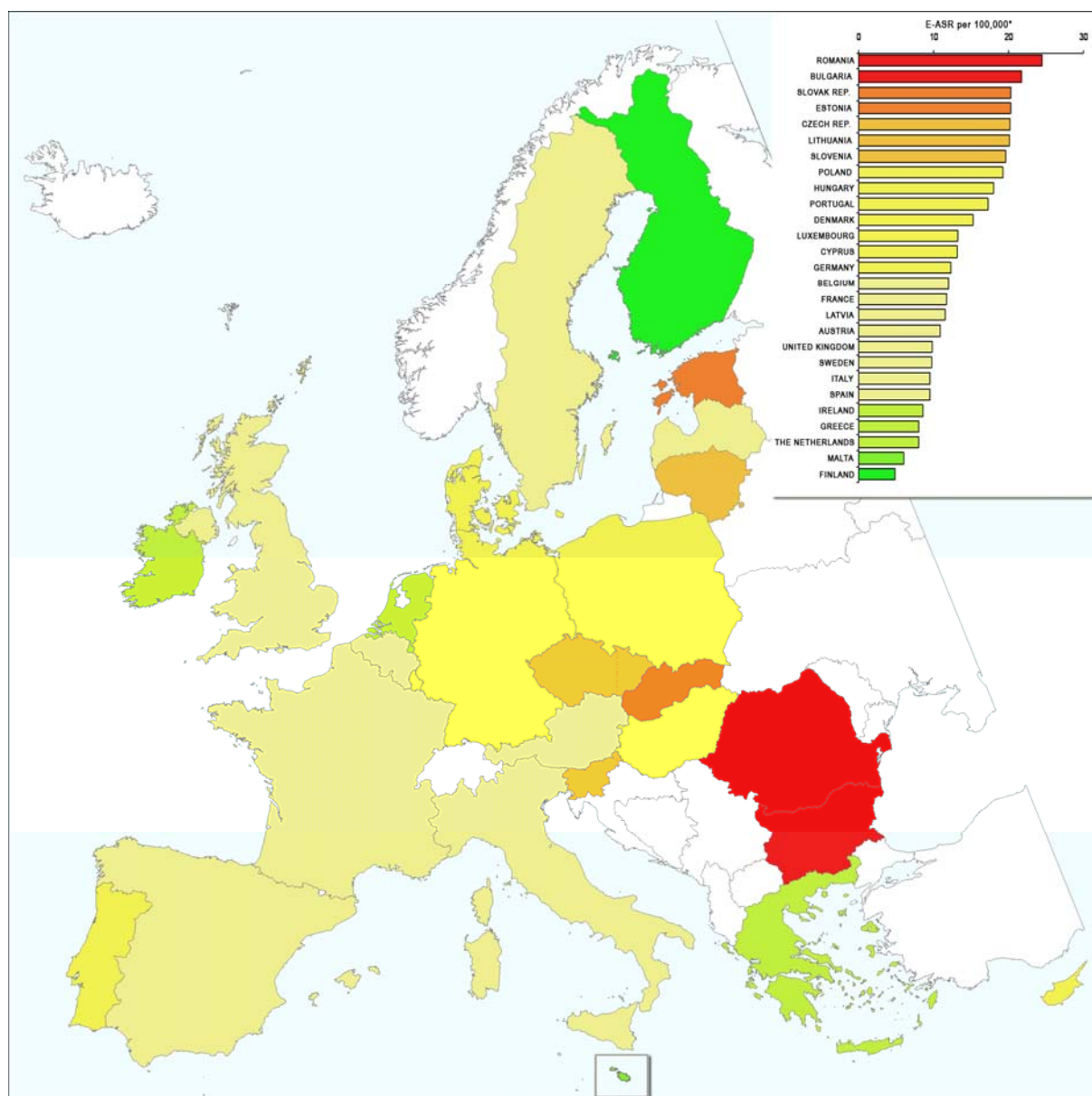
Cutpoints for color scale from green (lowest mortality) to yellow, brown and red (highest mortality) based on distribution of mortality among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles): 20.4, 20.5, 21.2, 24.6, 27.3, 30.3, 33.54 deaths per 100,000

Lowest mortality in Spain (19.2/100,000) and Bulgaria (20.4/100,000)

Highest mortality in Denmark (34.5/100,000) and Belgium (33.5/100,000)

Source: IARC (ECN and EUNICE projects, 2007); Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P (2007) *Ann Oncol* 18: 581-592

## Cervical cancer incidence in the EU Member States 2004



**Figure 2 c.** Age-standardised rates of incidence of cervical cancer (cases per 100,000 women-years) in the 27 Member States of the European Union, ranked by increasing incidence, estimates for 2004 (direct standardisation using the European reference population)

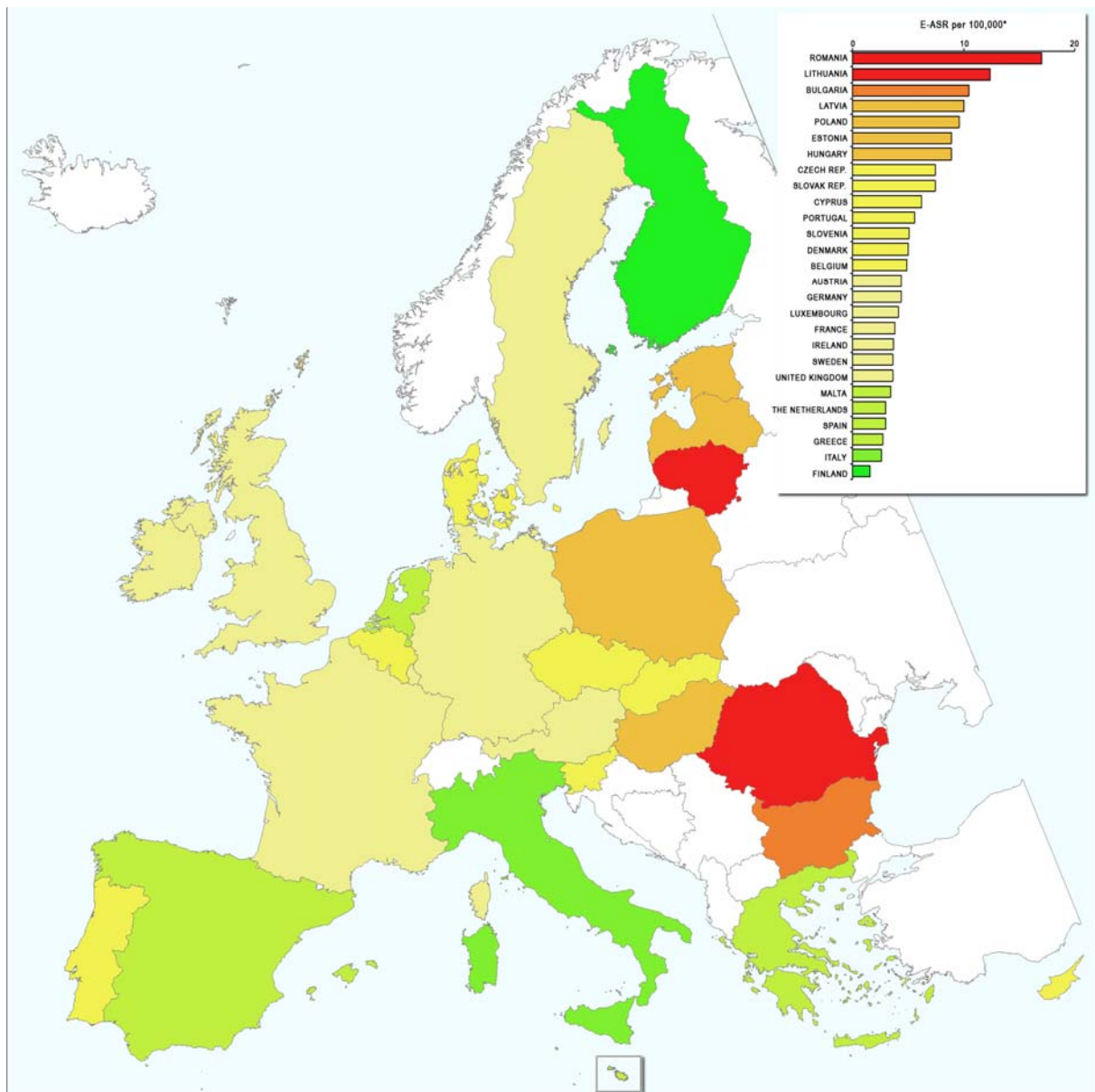
Cutpoints for color scale from green (lowest incidence) to yellow, brown and red (highest incidence) based on distribution of incidence among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles 6.0, 8.0, 9.5, 12.3, 19.6, 20.3, 21.7 cases per 100,000)

Lowest incidence in Finland (4.9/100,000) and Malta (6.0/100,000)

Highest incidence in Romania (24.5/100,000) and Bulgaria (21.7/100,000)

Source: IARC (ECN and EUNICE projects, 2007); incidence estimates adapted from: Arbyn et al (2007) *Ann Oncol* 18: 1423-1425; Arbyn et al. (2007) *Ann Oncol* 18: 1708-1715; Boyle P, Ferlay J (2005) *Ann Oncol* 16: 481-488; Ferlay et al. (2007) *Ann Oncol* 18: 581-592

## Cervical cancer mortality in the EU Member States 2004



**Figure 2 d.** Age-standardised rates of mortality of cervical cancer (deaths per 100,000 women-years) in the 27 Member States of the European Union, ranked by increasing mortality, estimates for 2004 (direct standardisation using the European reference population).

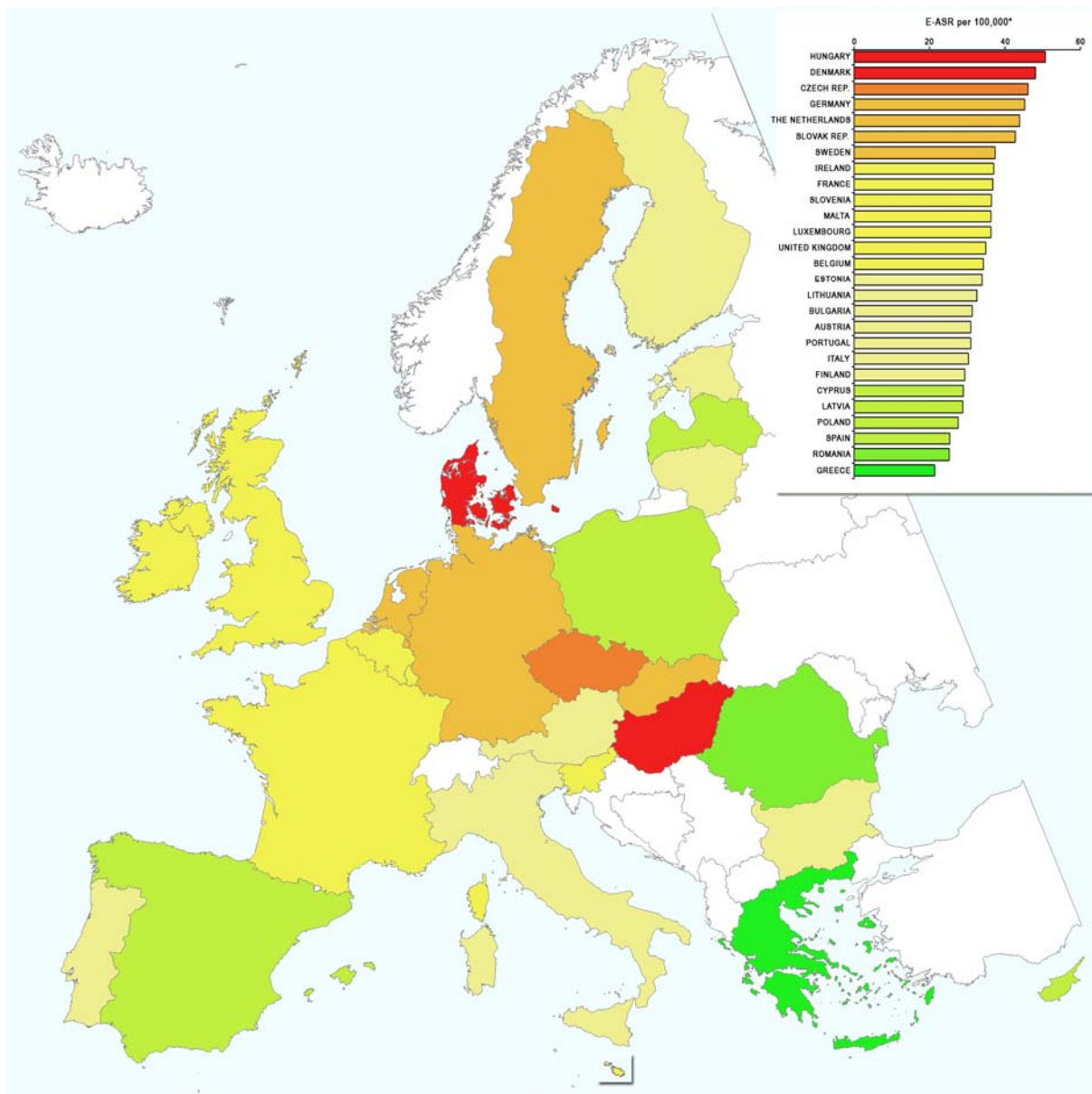
Cutpoints for color scale from green (lowest mortality) to yellow, brown and red (highest mortality) based on distribution of mortality among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles): 2.6, 2.7, 3.6, 4.9, 8.9, 10.5, 12.4 deaths per 100,000.

Lowest mortality in Finland (1.6/100,000) and Italy (2.6/100,000)

Highest mortality in Romania (17.0/100,000) and Lithuania (12.4/100,000)

Source: IARC (ECN and EUNICE projects, 2007); mortality estimates adapted from: Arbyn et al (2007) Ann Oncol 18: 1423-1425; Arbyn et al. (2007) Ann Oncol 18: 1708-1715; Boyle P, Ferlay J (2005) Ann Oncol 16: 481-488; Ferlay et al. (2007) Ann Oncol 18: 581-592

## Colorectal cancer incidence in women in the EU Member States 2006



**Figure 2 e.** Age-standardised rates of incidence of colorectal cancer (cases per 100,000 women-years) in the 27 Member States of the European Union, ranked by increasing incidence, estimates for 2006 (direct standardisation using the European reference population)

Cutpoints for color scale from green (lowest incidence) to yellow, brown and red (highest incidence) based on distribution of incidence among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles): 25.1, 25.4, 29.4, 34.3, 37.4, 46.0, 48.0 cases per 100,000

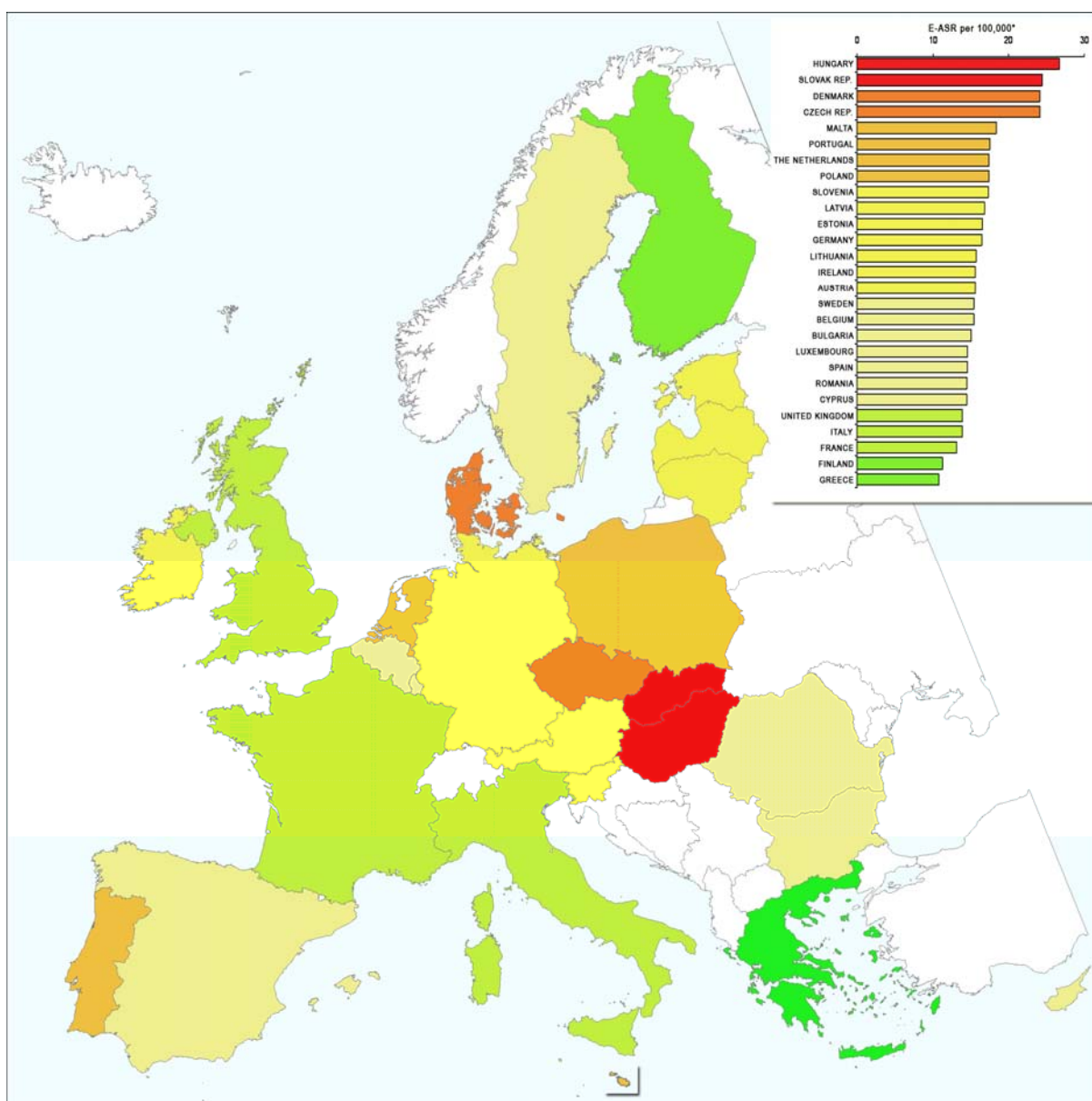
Lowest incidence in Greece (21.3/100,000) and Spain (25.4/100,000)

Highest incidence in Hungary (50.6/100,000) and Denmark (48.0/100,000)

Source: IARC (ECN and EUNICE projects, 2007); Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P (2007) Ann Oncol 18: 581-592



## Colorectal cancer mortality in women in the EU Member States 2006



**Figure 2 f.** Age-standardised rates of mortality of colorectal cancer (deaths per 100,000 women-years) in the 27 Member States of the European Union, ranked by increasing mortality, estimates for 2006 (direct standardisation using the European reference population)

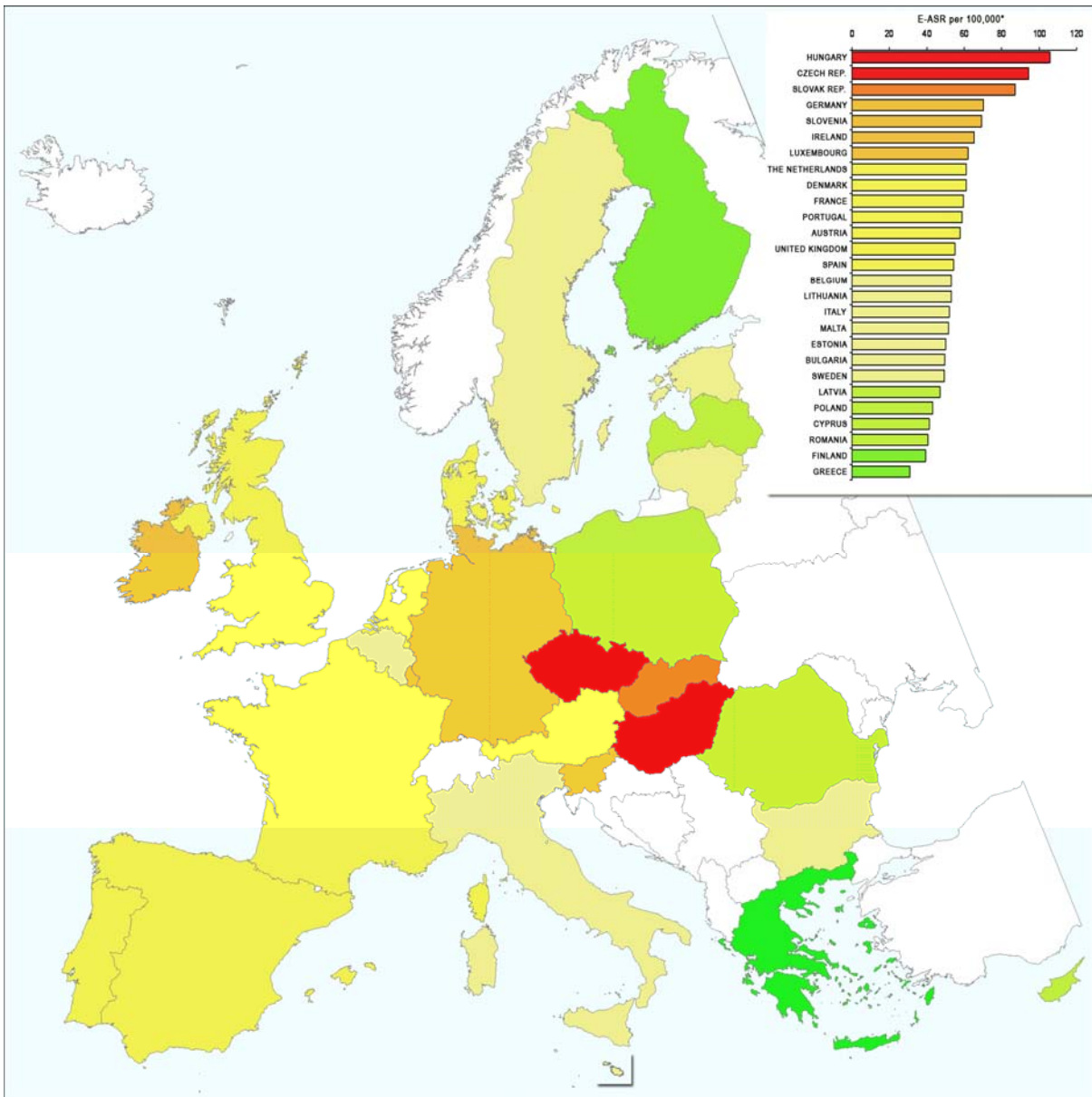
Cutpoints for color scale from green (lowest mortality) to yellow, brown and red (highest mortality) based on distribution of mortality among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles): 11.3, 13.2, 14.5, 15.6, 17.4, 24.1, 24.4 deaths per 100,000

Lowest mortality in Greece (10.8/100,000) and Finland (11.3/100,000)

Highest mortality in Hungary (26.7/100,000) and the Slovak Republic (24.4/100,000)

Source: IARC (ECN and EUNICE projects, 2007); Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P (2007) Ann Oncol 18: 581-592

## Colorectal cancer incidence in men in the EU Member States 2006



**Figure 2 g.** Age-standardised rates of incidence of colorectal cancer (cases per 100,000 man-years) in the 27 Member States of the European Union, ranked by increasing incidence, estimates for 2006 (direct standardisation using the European reference population)

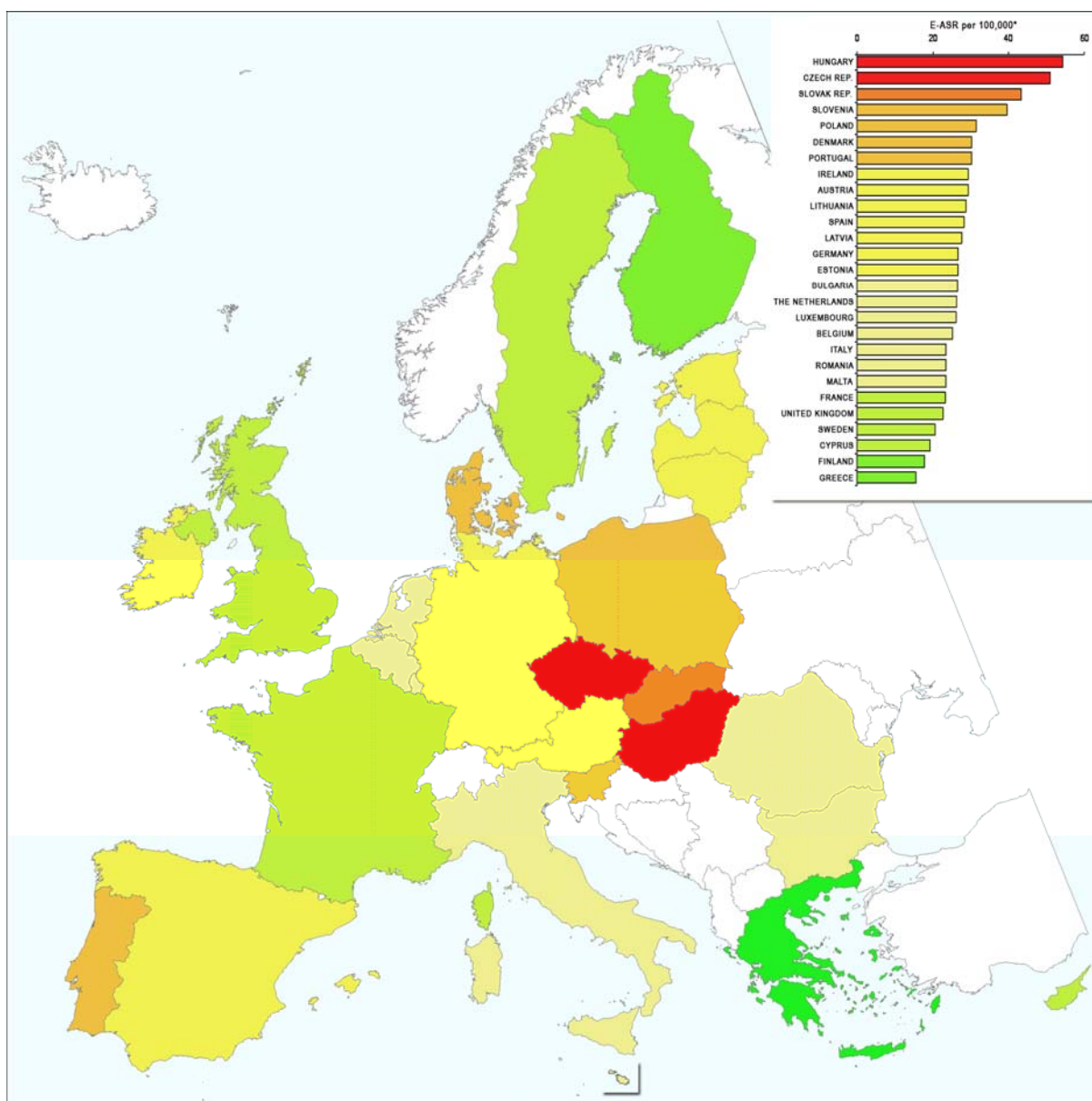
Cutpoints for color scale from green (lowest incidence) to yellow, brown and red (highest incidence) based on distribution of incidence among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles): 39.2, 40.7, 49.2, 54.4, 61.9, 87.1, 94.4 cases per 100,000

Lowest incidence in Greece (31.0/100,000) and Finland (39.2/100,000)

Highest incidence in Hungary (106.0/100,000) and the Czech Republic (94.4/100,000)

Source: IARC (ECN and EUNICE projects, 2007); Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P (2007) Ann Oncol 18: 581-592

## Colorectal cancer mortality in men in the EU Member States 2006



**Figure 2 h.** Age-standardised rates of mortality of colorectal cancer (deaths per 100,000 man-years) in the 27 Member States of the European Union, ranked by increasing mortality, estimates for 2006 (direct standardisation using the European reference population)

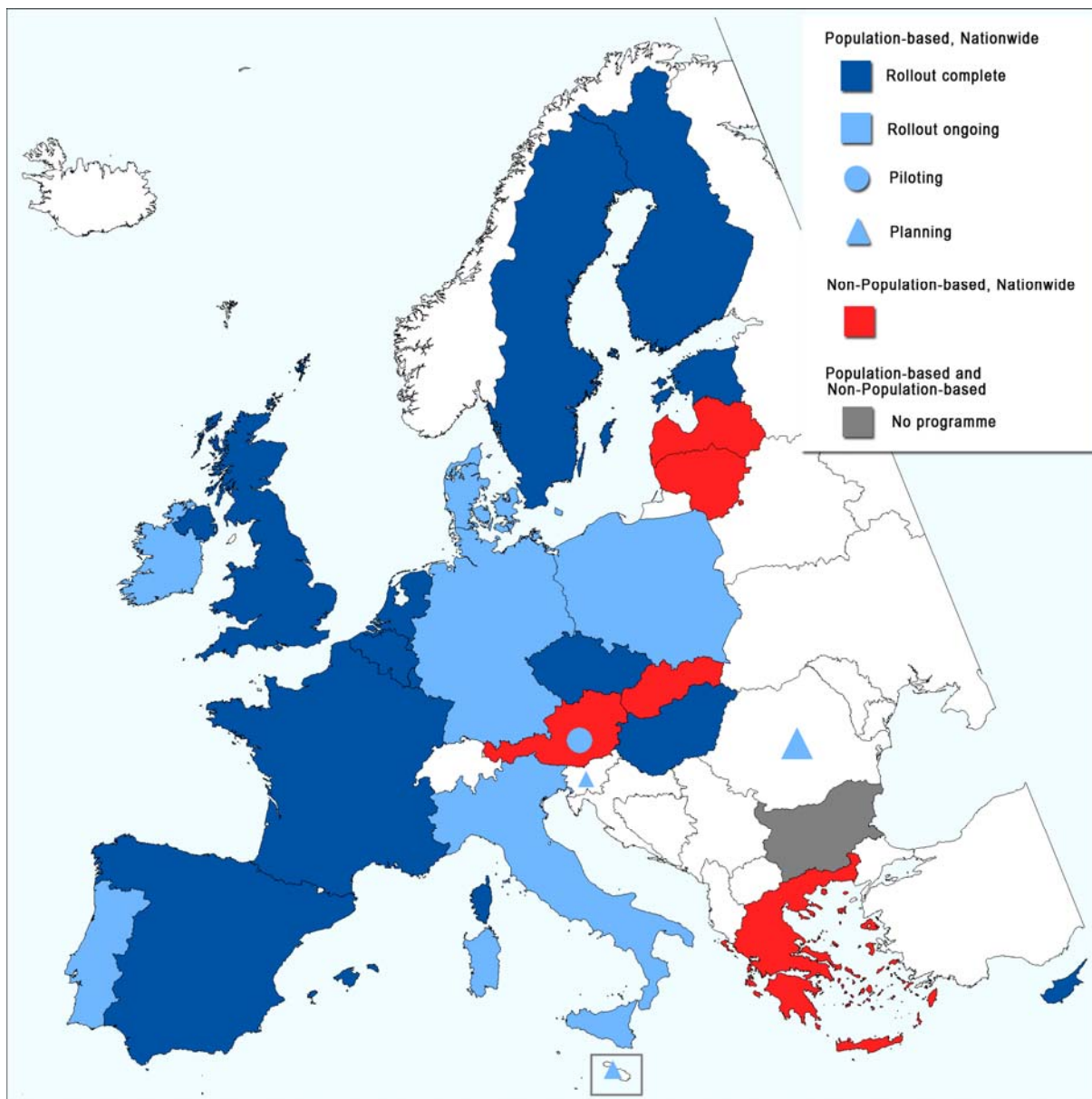
Cutpoints for color scale from green (lowest mortality) to yellow, brown and red (highest mortality) based on distribution of mortality among the 27 EU Member States (5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles): 17.8, 19.3, 23.4, 26.6, 30.2, 43.3, 51.0 deaths per 100,000

Lowest mortality in Greece (15.5/100,000) and Finland (17.8/100,000)

Highest mortality in Hungary (54.4/100,000) and the Czech Republic (51.0/100,000)

Source: IARC (ECN and EUNICE projects, 2007); Ferlay J, Autier P, Boniol M, Heanue M, Colombet M, Boyle P (2007) Ann Oncol 18: 581-592

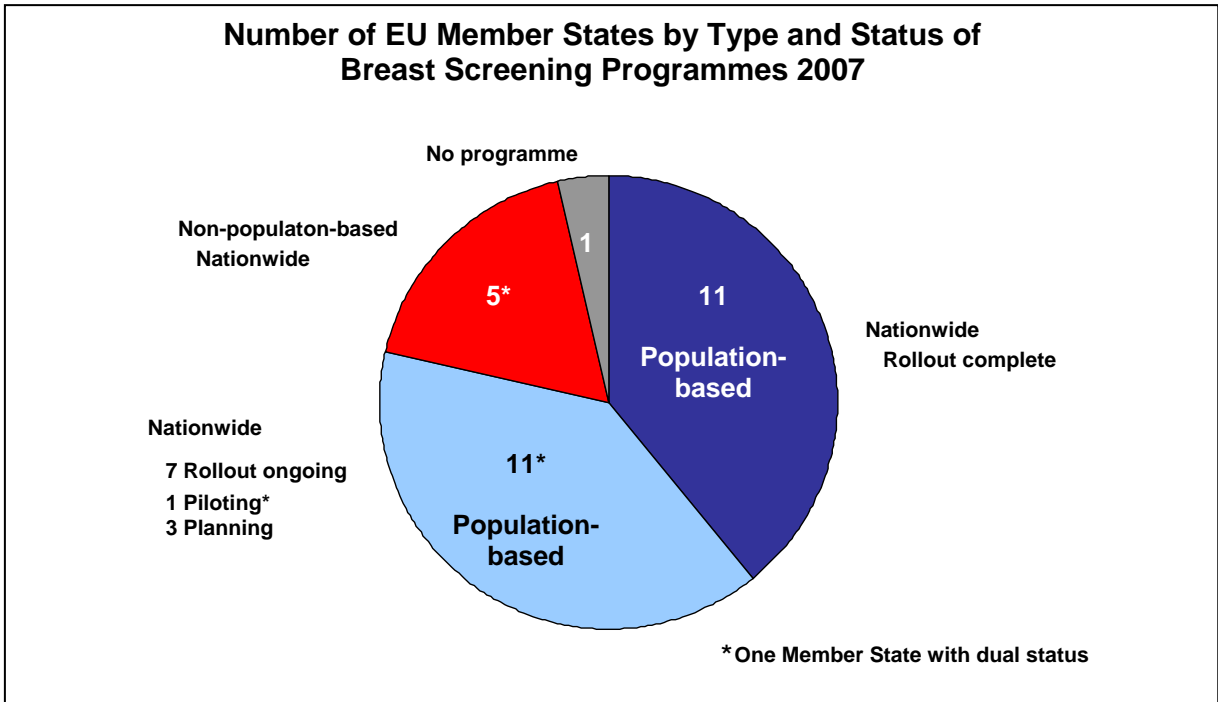
### Distribution of Breast Cancer Screening Programmes Based on Mammography in the EU in 2007



**Figure 3 a.** Breast screening programmes in the European Union in 2007, by programme type (population-based; non-population-based; no programme) and country implementation status (population-based: nationwide or regional, rollout complete or ongoing, piloting and/or planning; non-population-based: nationwide or regional). Programmes shown use screening test (mammography) recommended by the Council of the European Union in 2003 (see Annex 2). For definitions see the text (section 2.3).

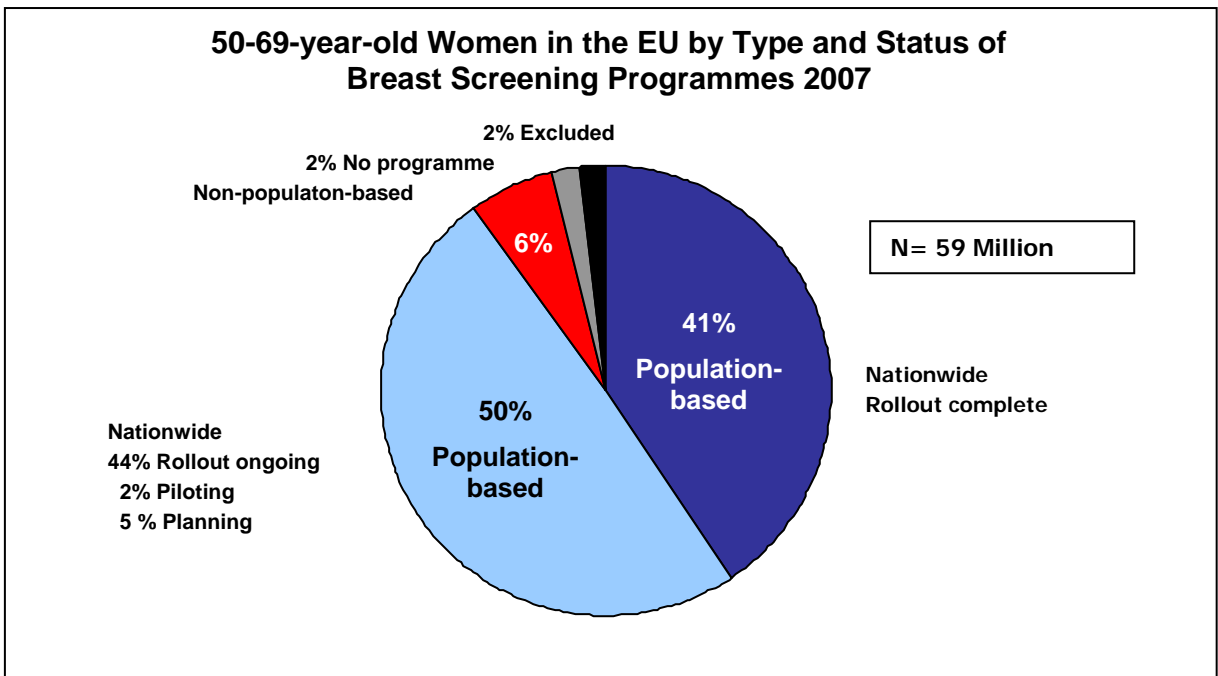
Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)





**Figure 3 b** Number of EU Member States with breast cancer screening programmes in 2007, by type of programme and country implementation status. Numbers do not add up to 27 due to dual programme type of Austria. For definitions of programme type and status see the text (section 2.3).

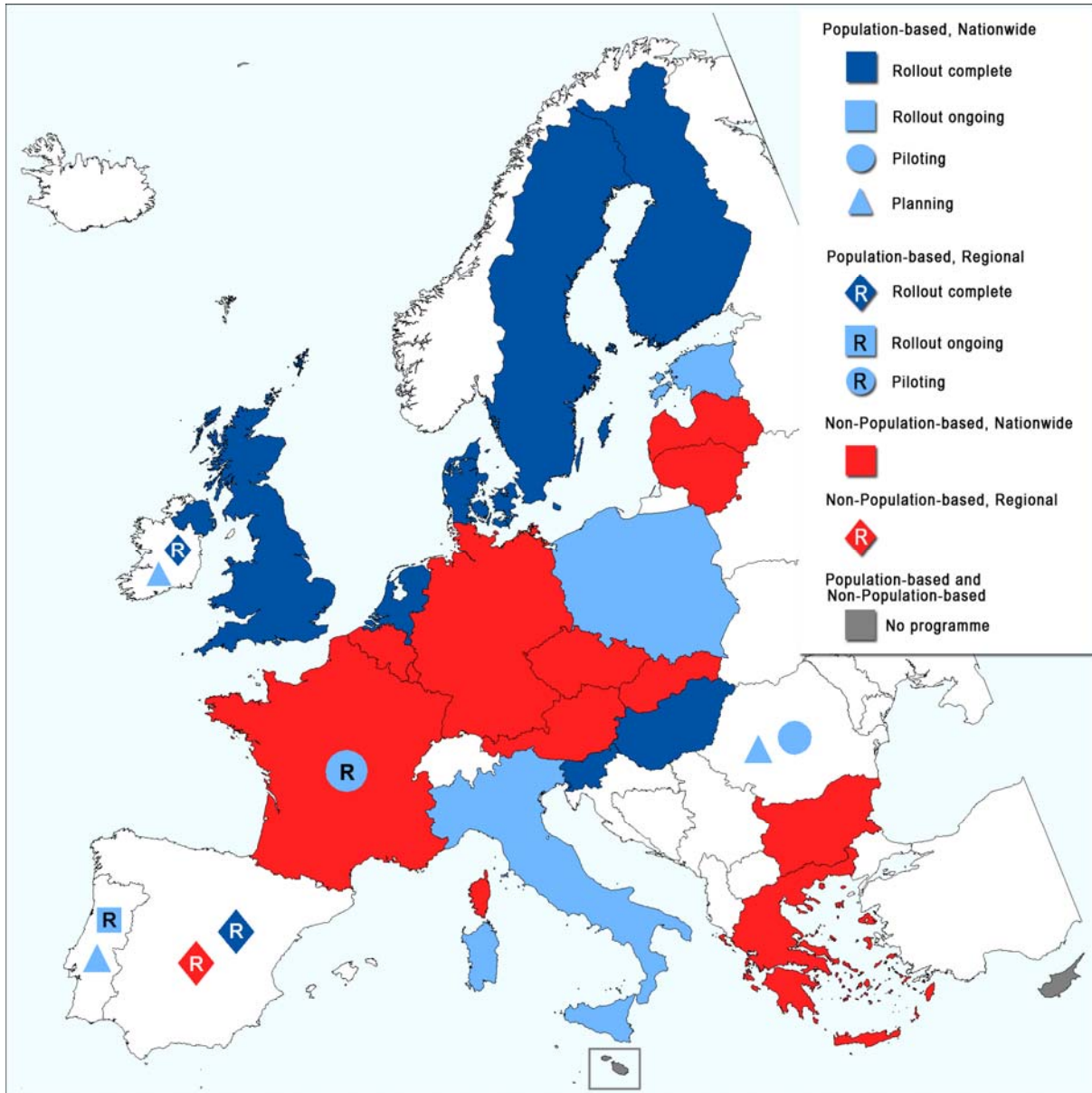
Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)



**Figure 3 c.** Proportion of 50-69-year-old women in the European Union targeted for breast cancer screening in 2007, by programme type and country implementation status, and women excluded due to age (proportions of 50-69-year-old women in the EU population in %). Numbers do not add up to 100% due to dual programme type of Austria and due to rounding. For definitions of programme type and status see the text (section 2.3).

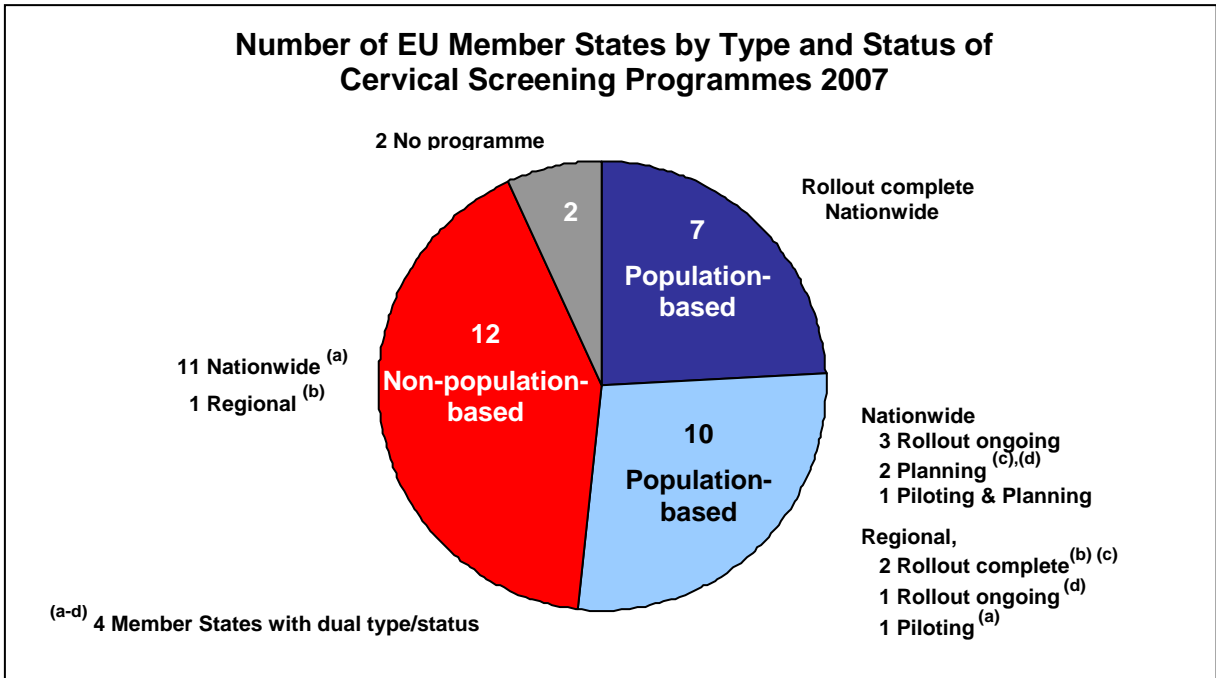
Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)

## Distribution of Cervical Screening Programmes based on Cervical Cytology in the EU in 2007



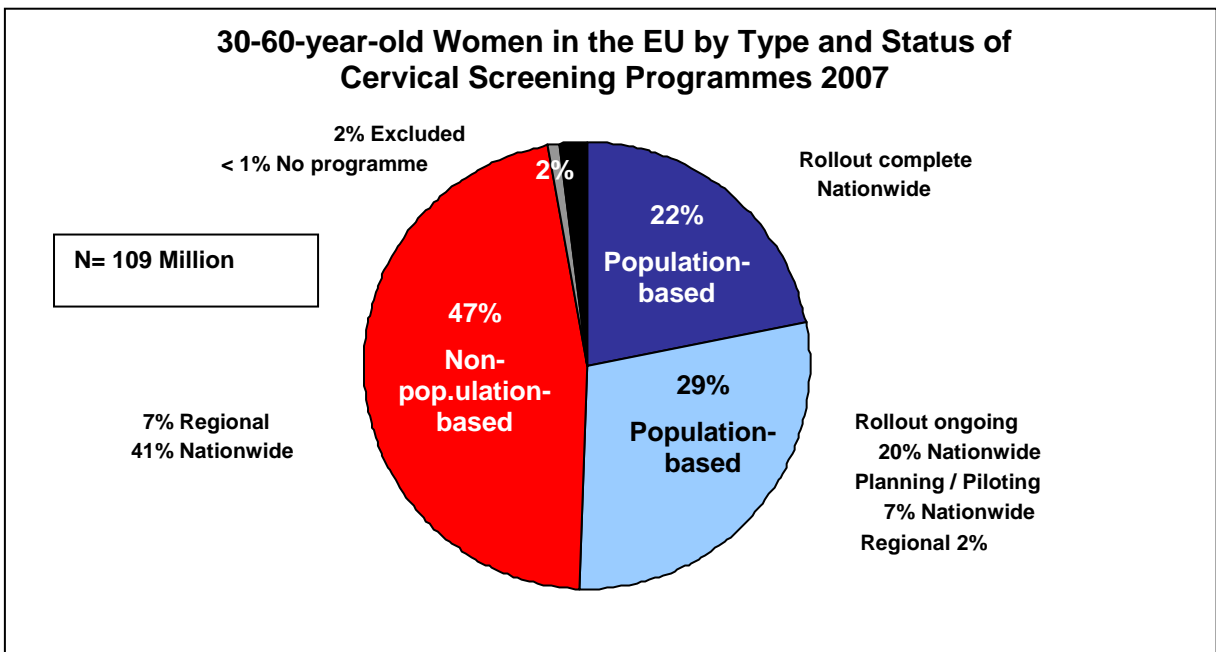
**Figure 4 a.** Cervical cancer screening programmes in the European Union in 2007, by programme type (population-based; non-population-based; no programme) and country implementation status (population-based: nationwide or regional, rollout complete or ongoing, piloting and/or planning; non-population-based: nationwide or regional). Programmes shown use screening test (PAP smear) recommended by the Council of the European Union in 2003 (seen Annex 2). For definitions see the text (section 2.3).

Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)



**Figure 4 b.** Number of EU Member States with cervical cancer screening programmes in 2007, by type of programme and country implementation status. Numbers do not add up to 27 due to dual types of France and Spain and dual status of Ireland and Portugal. For definitions of programme type and status see the text (section 2.3).

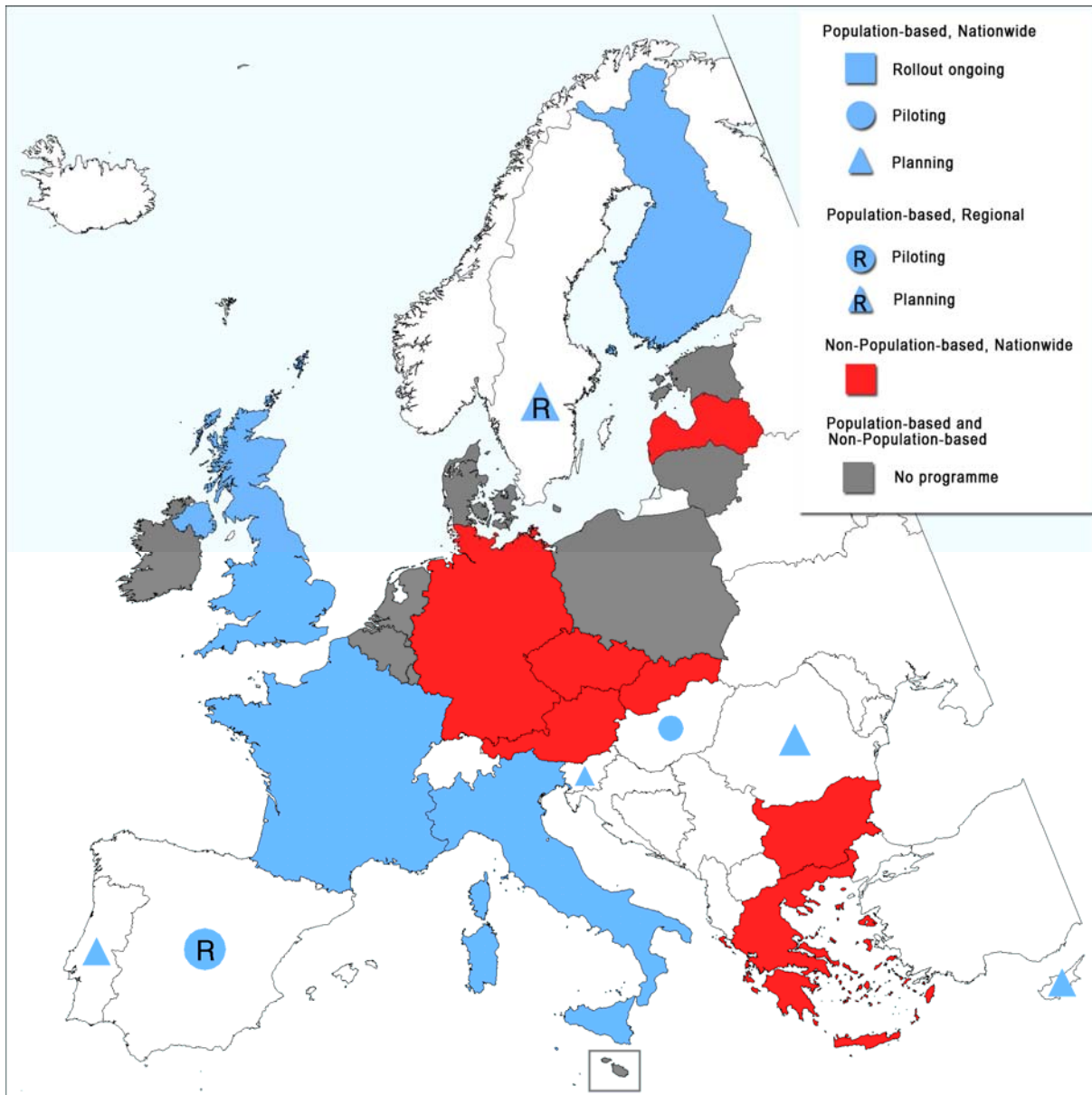
Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)



**Figure 4 c.** Proportion of 30-60-year-old women in the European Union targeted for cervical cancer screening in 2007, by programme type and country implementation status, and women excluded due to age or lack of regional programmes in countries with regional implementation status (proportions of 30-60-year-old women in the EU population in %). For definitions of programme type and status see the text (section 2.3).

Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)

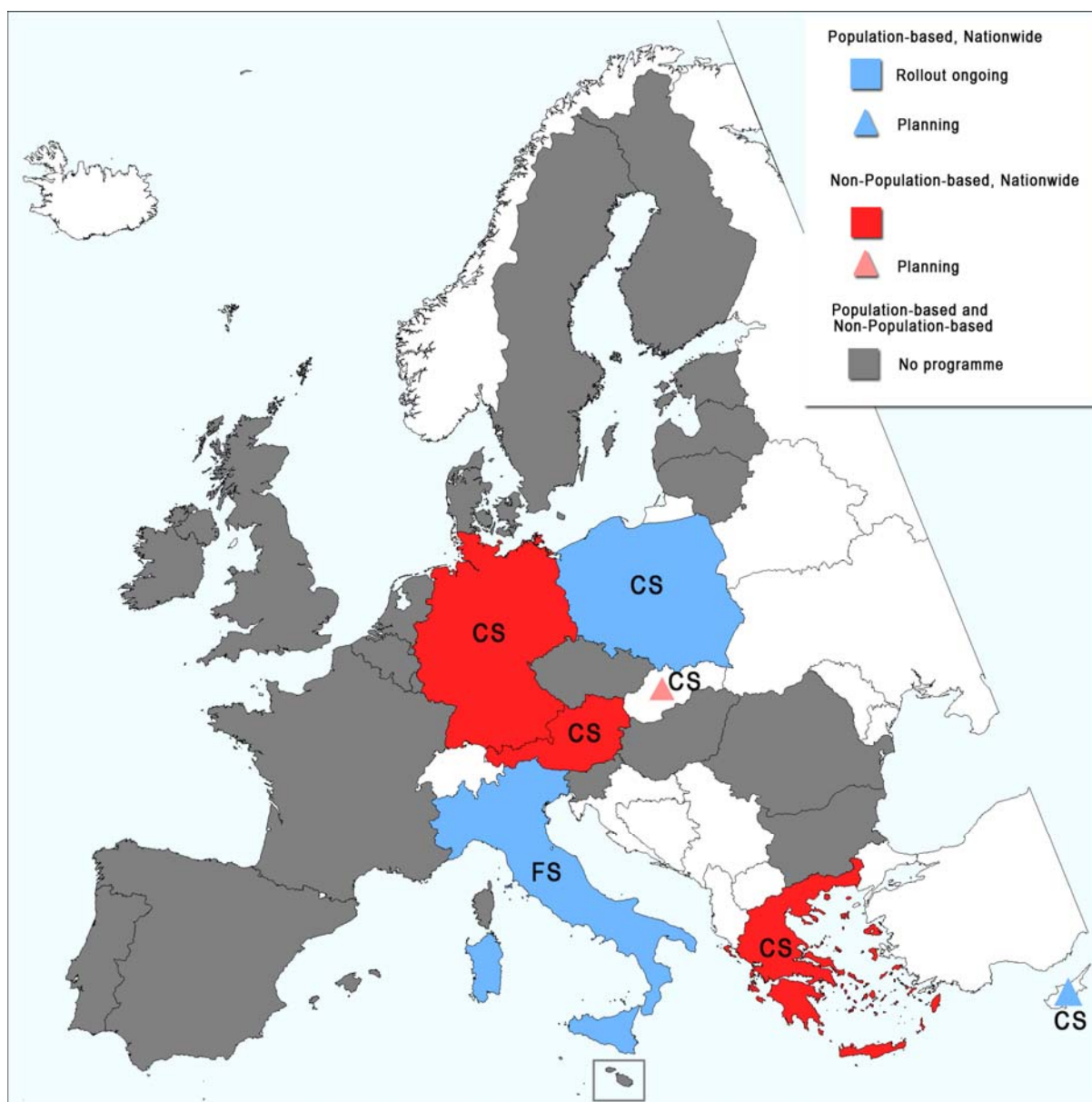
## Distribution of Colorectal Cancer Screening Programmes based on the Faecal Occult Blood Test in the EU in 2007



**Figure 5.** Colorectal cancer screening programmes based on FOBT (faecal occult blood test) in the European Union in 2007, by programme type (population-based; non-population-based; no programme) and country implementation status (population-based: nationwide or regional, rollout complete or ongoing, piloting and/or planning; non-population-based: nationwide or regional). Programmes shown use screening test recommended by the Council of the European Union in 2003 (see Annex 2). For definitions see the text (section 2.3).

Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)

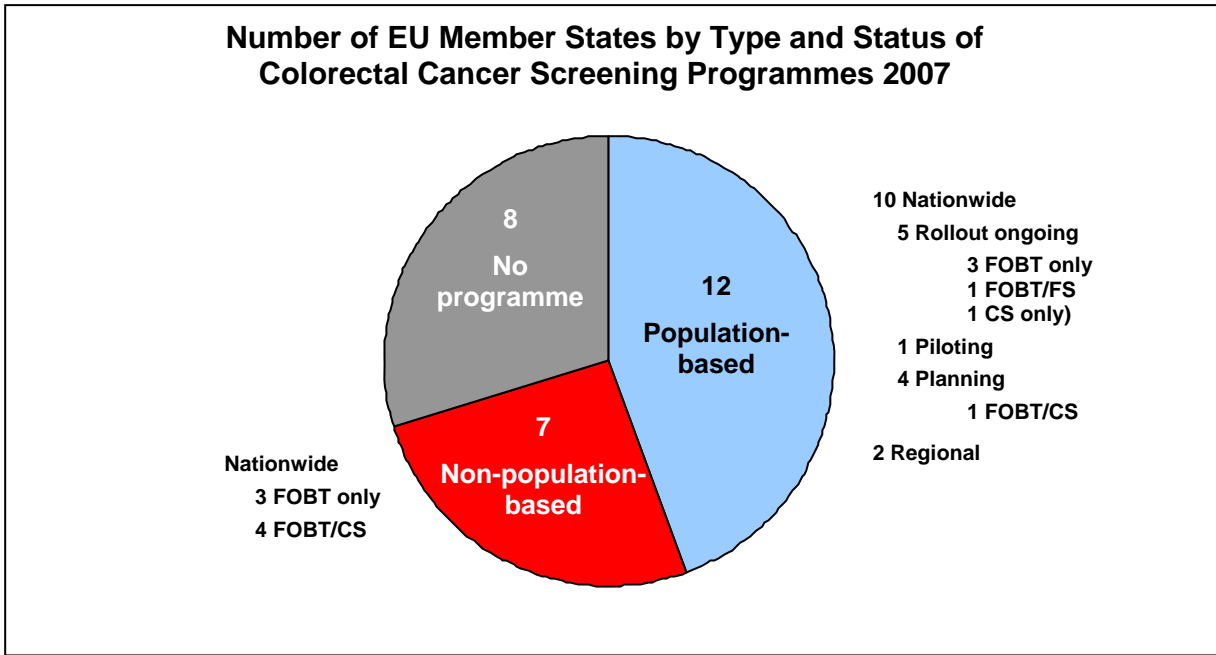
## Distribution of Colorectal Cancer Screening Programmes based on Novel Screening Tests still under Evaluation (Endoscopy) in the EU in 2007



**Figure 6.** Colorectal cancer screening programmes based on novel screening tests still under evaluation (Endoscopy) in the European Union in 2007, by programme type (population-based; non-population-based; no programme) and country implementation status (population-based: nationwide or regional, rollout complete or ongoing, piloting and/or planning; non-population-based: nationwide or regional). Programmes shown use screening tests based on methodology different from that recommended by the Council of the European Union in 2003 (see Annex 2). For definitions see the text (section 2.3).

Abbreviations: FS (flexible sigmoidoscopy), CS (colonoscopy).

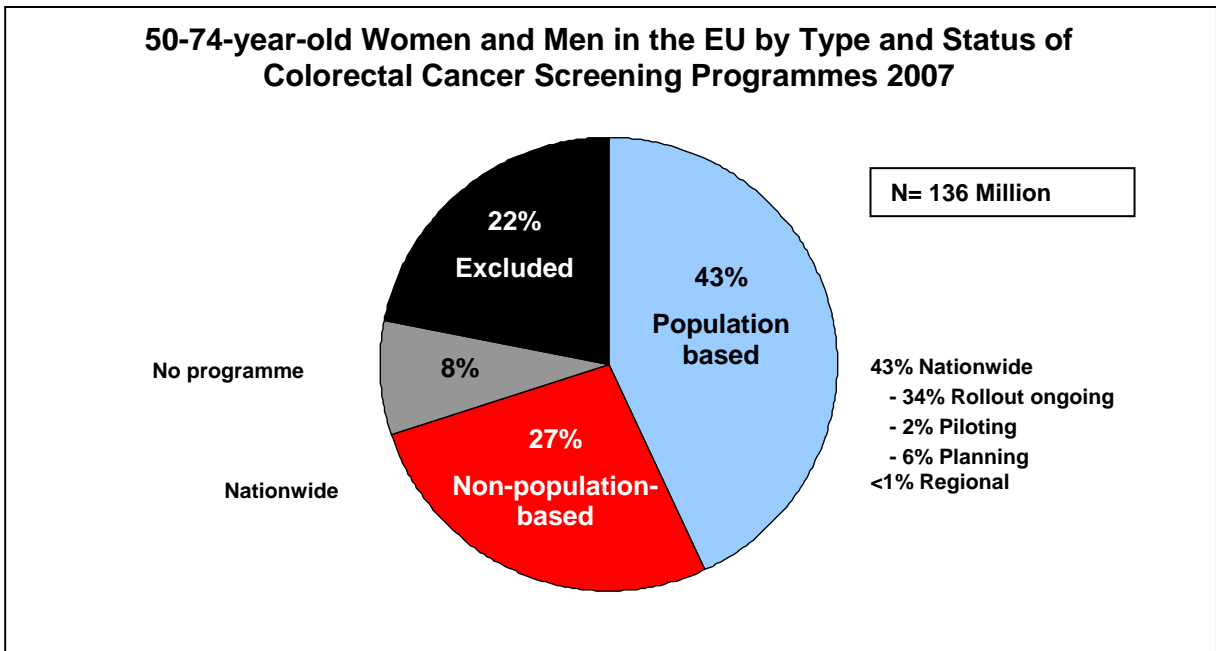
Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)



**Figure 7 a.** Number of EU Member States with colorectal cancer screening programmes in 2007 by type of programme and country implementation status. In each respective category individual countries are counted only once. Abbreviations: FOBT, CS and FS (see legends of Figs. 5 and 6). MS (Member State). For definitions of programme type and status see the text (section 2.3).

Note: the FOBT is the screening test recommended by the Council of the European Union in 2003 (Annex 2).

Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)



**Figure 7 b.** Proportion of 50-74-year-old women and men targeted for colorectal cancer screening in the European Union in 2007, by programme type and country implementation status, and women and men excluded due to age or lack of regional programmes in countries with regional implementation status (proportions of 50-74-year-old persons in the EU population in %). For definitions of programme type and status see the text (section 2.3).

Source: European Commission (DG SANCO, 2007); IARC (ECN and EUNICE projects, 2007)

# Tables

Table 1	Burden of Breast, Cervical and Colorectal Cancer in Women in the EU Member States											
	Cases and deaths and European age-standardized rates (E-ASR) by cancer type and Member State											
	Breast cancer (2006)				Cervical cancer (2004)				Colorectal cancer (2006)			
	incidence		mortality		incidence		mortality		incidence		mortality	
	cases x 100	E-ASR	deaths x 100	E-ASR	cases x 100	E-ASR	deaths x 100	E-ASR	cases x 100	E-ASR	deaths x 100	E-ASR
Austria	47.8	91.5	15.5	24.6	5.1	10.9	2.5	4.4	20.8	30.9	12.0	15.6
Belgium	90.9	137.8	26.1	33.5	6.9	12.0	3.7	4.9	30.0	34.3	15.4	15.4
Bulgaria	36.3	74.0	11.2	20.4	9.1	21.7	5.0	10.5	18.5	31.3	9.7	15.0
Cyprus	3.7	88.4	1.0	22.1	0.5	13.1	0.3	6.2	1.3	29.0	0.7	14.5
Czech Rep	56.6	84.8	20.3	26.7	11.7	20.2	5.0	7.4	35.2	46.0	19.5	24.1
Denmark	41.2	122.6	13.5	34.5	4.5	15.2	1.8	5.0	19.5	48.0	10.8	24.1
Estonia	6.4	71.1	2.6	26.0	1.6	20.3	0.8	8.9	3.9	33.9	2.1	16.6
Finland	40.9	119.8	8.2	20.5	1.4	4.9	0.6	1.6	12.6	29.4	5.3	11.3
France	469.1	127.4	113.0	25.9	40.8	11.7	15.6	3.8	182.2	36.8	75.4	13.2
Germany	675.7	121.2	175.4	26.5	55.6	12.3	25.8	4.4	332.4	45.1	140.2	16.5
Greece	63.7	81.8	18.6	21.7	4.8	8.0	2.1	2.7	19.9	21.3	10.5	10.8
Hungary	76.4	118.0	22.9	30.3	9.7	18.0	5.6	8.9	40.9	50.6	23.0	26.7
Ireland	26.7	131.4	6.5	29.3	1.7	8.6	0.8	3.7	8.6	36.9	3.9	15.6
Italy	434.2	105.3	112.9	24.0	31.3	9.5	10.9	2.6	166.9	30.3	82.7	13.9
Latvia	10.1	64.8	4.4	26.4	1.6	11.5	1.7	10.0	5.7	28.7	3.6	16.8
Lithuania	15.1	68.7	5.9	25.8	4.3	20.1	2.8	12.4	8.6	32.5	4.4	15.7
Luxembourg	3.1	116.9	0.8	23.4	0.3	13.2	0.1	4.1	1.2	36.1	0.6	14.6
Malta	2.3	94.5	0.6	23.0	0.1	6.0	0.1	3.4	1.0	36.2	0.5	18.4
Netherlands	123.0	128.0	32.7	29.8	7.0	8.0	3.1	3.0	49.5	43.9	21.9	17.4
Poland	165.7	74.1	51.3	20.9	40.8	19.2	22.2	9.6	72.0	27.7	48.3	17.4
Portugal	63.4	103.5	15.9	21.0	9.8	17.2	3.8	5.6	26.4	30.9	15.8	17.5
Romania	79.1	61.2	32.6	23.9	28.6	24.5	21.4	17.0	37.3	25.1	22.4	14.5
Slovak Republic	21.4	69.7	6.8	21.2	5.8	20.3	2.3	7.4	14.3	42.6	8.6	24.4
Slovenia	11.2	87.5	4.1	28.6	2.1	19.6	0.7	5.1	5.5	36.3	3.0	17.3
Spain	229.9	93.6	59.9	19.2	21.1	9.5	7.8	3.0	90.8	25.4	56.5	14.6
Sweden	71.8	125.8	14.3	21.1	4.8	9.7	2.5	3.6	27.8	37.4	12.8	15.4
UK	448.4	122.2	120.2	27.3	32.3	9.8	14.3	3.6	163.7	34.8	71.8	13.9
<b>totals</b>	<b>3,313.9</b>		<b>896.7</b>		<b>343.3</b>		<b>163.3</b>		<b>1,396.5</b>		<b>681.1</b>	

Source: incidence and mortality estimates by IARC (2007) adapted from: Arbyn M, Autier P, Ferlay J (2007) Ann Oncol 18: 1423-1425; Arbyn M, Raifu AO, Autier P, Ferlay J (2007) Ann Oncol 18: 1708-1715; Boyle P, Ferlay J (2005) Ann Oncol 16: 481-488; Ferlay J et al. (2007) Ann Oncol 18: 581-592



<b>Table 2</b>	<b>Burden of Colorectal Cancer in Men in the EU Member States</b>			
	Cases and deaths and European age-standardized rates (E-ASR) by Member State (2006)			
	incidence		mortality	
	cases x 100	E-ASR	deaths x 100	E-ASR
<b>Austria</b>	26.9	57.6	13.9	29.3
<b>Belgium</b>	34.3	53.3	16.5	25.2
<b>Bulgaria</b>	22.8	49.6	12.7	26.5
<b>Cyprus</b>	1.5	41.2	0.7	19.3
<b>Czech Rep</b>	51.2	94.4	27.1	51.0
<b>Denmark</b>	19.7	61.0	9.9	30.3
<b>Estonia</b>	3.2	50.0	1.7	26.6
<b>Finland</b>	12.1	39.2	5.4	17.8
<b>France</b>	216.0	59.8	86.6	23.2
<b>Germany</b>	373.7	70.2	143.2	26.7
<b>Greece</b>	23.6	31.0	12.1	15.5
<b>Hungary</b>	56.0	106.0	28.7	54.4
<b>Ireland</b>	12.4	65.2	5.6	29.4
<b>Italy</b>	211.2	52.0	97.0	23.5
<b>Latvia</b>	5.2	47.0	3.0	27.7
<b>Lithuania</b>	8.4	53.1	4.6	28.8
<b>Luxembourg</b>	1.5	61.9	0.6	26.1
<b>Malta</b>	1.1	51.5	0.5	23.4
<b>Netherlands</b>	55.4	61.2	23.6	26.3
<b>Poland</b>	76.2	43.1	55.1	31.5
<b>Portugal</b>	37.5	58.9	19.5	30.2
<b>Romania</b>	45.1	40.7	26.2	23.5
<b>Slovak Republic</b>	20.0	87.1	9.8	43.3
<b>Slovenia</b>	7.4	69.0	4.2	39.6
<b>Spain</b>	145.6	54.4	77.7	28.2
<b>Sweden</b>	30.0	49.2	13.1	20.7
<b>UK</b>	200.9	54.9	84.7	22.8
<b>totals</b>	<b>1,699.0</b>		<b>783.5</b>	

Source: incidence and mortality estimates by IARC (2007), Ferlay J et al. (2007) Ann Oncol 18: 581-592

Table 3 a	Breast Screening Programmes in the EU Member States 2007 Programme type, country implementation status and estimated no. of 50-69-year-old women in national target populations*							
	Breast cancer screening programmes <sup>α</sup>							
	Population-based programmes		Non-pop.-based programmes		No programme		Totals	
	status	women (X 1000)	status	women (X1000)	status	women (X 1000)	countries (N)	women (X 1000)
1	2	3	4	5	6	7	8	9
<b>Austria**</b>	natw-pilot	980					1	980
			natw	980			1	980
<b>Belgium</b>	natw-rollout cmp	1,230					1	1,230
<b>Bulgaria**</b>					no prog	1,040	1	1,040
<b>Cyprus</b>	natw-rollout cmp	80					1	80
<b>Czech Rep**</b>	natw-rollout ong	1,380					1	1,380
<b>Denmark</b>	natw-rollout ong	680					1	680
<b>Estonia</b>	natw-rollout cmp	100					1	100
<b>Finland</b>	natw-rollout cmp	480					1	480
<b>France</b>	natw-rollout cmp	7,230					1	7,230
<b>Germany</b>	natw-rollout ong	10,400					1	10,400
<b>Greece</b>			natw	1,350			1	1,350
<b>Hungary</b>	natw-rollout cmp	1,110					1	1,110
<b>Ireland</b>	natw-rollout ong	330					1	330
<b>Italy **</b>	natw-rollout ong	7,340					1	7,340
<b>Latvia</b>			natw	310			1	310
<b>Lithuania</b>			natw	410			1	410
<b>Luxembourg</b>	natw-rollout cmp	50					1	50
<b>Malta**</b>	natw-plan	30					1	30
<b>Netherlands</b>	natw-rollout cmp	1,930					1	1,930
<b>Poland**</b>	natw-rollout ong	4,650					1	4,650
<b>Portugal</b>	natw-rollout ong	1,280					1	1,280
<b>Romania</b>	natw-plan	2,610					1	2,610
<b>Slovak Republic</b>			natw	640			1	640
<b>Slovenia</b>	natw-plan	250					1	250
<b>Spain</b>	natw-rollout cmp	4,200					1	4,200
<b>Sweden**</b>	natw-rollout cmp	1,110					1	1,110
<b>UK</b>	natw-rollout cmp	6,860					1	6,860
Subtotal		54,310		3,690		1040	28	59,040
-Dual type <sup>f</sup>				980			1	980
<b>Totals</b>	-	<b>54,310</b>	-	<b>2,710</b>	-	<b>1,040</b>	<b>27</b>	<b>58,060</b>

Abbreviations: **natw** (nationwide), **rollout cmp** (rollout complete), **rollout ong** (rollout ongoing), **pilot** (piloting), **plan** (planning), **reg** (regional), **no prog** (no programme)

Sources: Survey DG SANCO 2007, ECN / EUNICE projects, other sources see footnotes of Table 3 b

<sup>α</sup> Programmes using the screening test recommended in the Council Recommendation of December 2003: mammography.

\* 50-69-year-old women in national populations in the age group targeted for screening, adjusted for regional variation in targeted age range (Finland, Spain and UK) or due to nationwide exclusion of some age groups (Estonia 60-69 years, Hungary 66-69, Ireland 65-69, and Malta 60-69). Population statistics EUROSTAT 2007, except Finland (Mass Screening Registry 2005) and UK, (national statistics 2006).

<sup>f</sup> Dual type: women in Austria entered twice in table due to simultaneous programme activities of different type.

\*\* Austria: In addition to piloting a national pop.-based screening programme, non-pop.-based screening is offered nationwide.

\*\* Bulgaria: Preparation of National Cancer Control Strategy 2009-2019 deals with breast cancer screening programme.

\*\* Czech Republic: Status changed to population-based in the year personal invitation was initiated (2007).

\*\* Denmark: As of 31 December 2007 a nationwide screening programme based on 2-yearly mammography for women aged 50 to 69 years has been established.

\*\* Hungary: Complete programme rollout confirmed by Ministry of Health.

\*\* Italy: In 2007 in all Italian regions, at least one pilot population-based programme has been implemented.

Additional footnotes: See next page and Table 3 b.

Table 3 a	Breast Screening Programmes in the EU Member States 2007 Programme type, country implementation status and estimated no. of 50-69-year-old women in national target populations*							
	Breast cancer screening programmes <sup>a</sup>							
	Population-based programmes		Non-pop.-based programmes		No programme		Totals	
	status	women (X 1000)	status	women (X1000)	status	women (X 1000)	countries (N)	women (X 1000)
1	2	3	4	5	6	7	8	9
	Number of member states and target populations by programme type, and status - population size in absolute numbers -							
<b>Nationwide</b>								
rollout complete	11	24,380	5	3,690			16	28,070
rollout ongoing	7	26,060					7	26,060
piloting	1	980					1	980
planning	3	2,890					3	2,890
<b>Regional</b>								
<b>No Prog.</b>					1	1,040	1	1,040
<b>Totals</b>	<b>22</b>	<b>54,310</b>	<b>5</b>	<b>3,690</b>	<b>1</b>	<b>1,040</b>	<b>28</b>	<b>59,040</b>
<b>Adjustments</b>								
-Dual type f			1	980			1	980
<b>Subtotal</b>	<b>22</b>	<b>54,310</b>	<b>4</b>	<b>2,710</b>	<b>1</b>	<b>1,040</b>	<b>27</b>	<b>58,060</b>
+Excluded pop.~		1,317						1,317
<b>Adjusted totals</b>	<b>22</b>	<b>55,627</b>	<b>4</b>	<b>2,710</b>	<b>1</b>	<b>1,040</b>	<b>27</b>	<b>59,377</b>
	Number of member states and target populations by programme type, and status - population size in % 50-69-year-old women in EU -							
<b>Nationwide</b>								
rollout complete	11	41.1%	5	6.2%			16	47.3%
rollout ongoing	7	43.9%					7	43.9%
piloting	1	1.7%					1	1.7%
planning	3	4.9%					3	4.9%
<b>Regional</b>								
<b>No Prog.</b>					1	1.8%	1	1.8%
<b>Totals</b>	<b>22</b>	<b>91.5%</b>	<b>5</b>	<b>6.2%</b>	<b>1</b>	<b>1.8%</b>	<b>28</b>	<b>99.4%</b>
<b>Adjustments</b>								
-Dual type f			1	1.7%			1	1.7%
<b>Subtotal</b>	<b>22</b>	<b>91.5%</b>	<b>4</b>	<b>4.6%</b>	<b>1</b>	<b>1.8%</b>	<b>27</b>	<b>97.8%</b>
+Excluded pop.~		2.2%						2.2%
<b>Adjusted totals</b>	<b>22</b>	<b>93.7%</b>	<b>4</b>	<b>4.6%</b>	<b>1</b>	<b>1.8%</b>	<b>27</b>	<b>100.0%</b>

~ 50-69-year-old women excluded from target populations of countries running or establishing nationwide population-based screening programmes because entire 50-69 age range is not targeted in all or some regions in: Estonia, Finland, Hungary, Ireland, Malta, Spain, UK

\*\* Latvia: Adoption of National Cancer Control Programme and Action Plan (including actions for transition to 2-yearly population-based mammography screening for women aged 50-69 beginning in 2009) expected in October 2008.

\*\* Malta: In Dec. 2007, the national authorities decided to begin implementation of a breast screening programme in 2008.

\*\* Poland: Status changed to population-based in the year personal invitation was initiated (2007).

\*\* Slovenia: Rollout of nationwide population-based breast screening programme began in April 2008.

\*\* Sweden: 60-70% of counties start at age 40. Approximately 50% of counties invite age group 70-74. 100% invite 50-69. Size of target population estimated to be 100% of age group 50-69 and 50% of age groups 40-49 and 70-74.

Additional footnotes: see previous page and Table 3 b.

Table 3 b	Annual volume of breast cancer screening programmes in the EU Member States 2006 Women personally invited, women screened, screening interval, non-programme examinations, and total size of national target populations by programme status									
	Breast cancer screening programmes <sup>a</sup>							Non-programme <sup>b</sup>		
	Programme		Age-eligible national population*		Screening interval	Personally invited~	Screened‡	Tests / yr (X 1000)	Age group (years)	
	Type	Country status	Eligible age† (years)	Women (X 1000)	(years)	Women / year (X 1000)	Women / year (X 1000)			
1	2	3	4	5	6	7	8	9	10	
Austria**	pop-bas	natw-pilot	40-69	240	(1)2	7				
Austria**	non-pop-bas	natw	40+	2,251	2					
Belgium**	pop-bas	natw-rollout cmp	50-69	1,230	2	620	180			
Bulgaria**	no prog	no prog								
Cyprus	pop-bas	natw-rollout cmp	50-69	84	2	30	14			
Czech Rep**	non-pop-bas	natw	45-69	1,699	2		250			
Denmark**	pop-bas	natw-rollout ong	50-69	675	2	52	39			
Estonia	pop-bas	natw-rollout cmp	50-59	98	2	42	21	9	50-69	
Finland	pop-bas	natw-rollout cmp	50-(59)69	478	2	240	210			
France**	pop-bas	natw-rollout cmp	50-74	8,609	2	4,480	2080	1720		
Germany	pop-bas	natw-rollout ong	50-69	10,446	2	510	300			
Greece**	non-pop-b	natw	40+	2,992	(1)2					
Hungary**	pop-bas	natw-rollout cmp	45-65	1,503	2	580	200	350		
Ireland	pop-bas	natw-rollout ong	50-64	333	2	83	63			
Italy**	pop-bas	natw-rollout ong	50-69	7,340	2	1,950	1170			
Latvia**	non-pop-b	natw	50-69	310	2			8		
Lithuania	non-pop-bas	natw	50-69	410	2	47	54			
Luxembourg	pop-bas	natw-rollout cmp	50-69	50	2	23	15	15		
Malta**	pop-bas	natw-plan	50-59(69)	30	3			4		
Netherlands**	pop-bas	natw-rollout cmp	50-75	2,310	2	1,090	892			
Poland**	non-pop-b	natw	50-69	4,650	2		540			
Portugal**	pop-bas	natw-rollout ong	45-69	1,660	2	250	140	310		
Romania	pop-bas	natw-plan	50-69	2,610	2					
Slovak Republic	non-pop-b	natw	40+	1,310	2			240		
Slovenia**	pop-bas	natw-plan	50-69	250	2			80		
Spain**	pop-bas	natw-rollout cmp	(45)50-64(70)	4,550	2	2,010	1310			
Sweden**	pop-bas	natw-rollout cmp	40(50)-(69)74	1,510	2					
UK**	pop-bas	natw-rollout cmp	50-(64)70	7,110	3	2,170	1690			
-Dual status <sup>f</sup>				490						
Totals	--	--	--	64,248	--	14,165	9,166	2,736		

### Table 3 b: Annual volume of breast cancer screening programmes in the EU member states 2006 - Footnotes

Abbreviations: **pop-b** (population-based), **non-pop-b** (non-population-based), and **no prog** (no programme), **natw** (nationwide), **rollout cmp** (rollout complete), **rollout ong** (rollout ongoing), **pilot** (piloting), **plan** (planning), **reg** (regional), **no prog** (no programme).

Source: EC survey DG SANCO (2007), IARC (ECN / EUNICE 2007). Other sources see below.

α Programmes using the screening test recommended in the Council Recommendation of December 2003: mammography.

\* Women in national populations in the age group targeted for screening, adjusted for regional variation in eligible age group. National population statistics from EUROSTAT 1 January 2007, except Finland (National Mass Screening Registry 2005), Spain (National Statistics Office 2005), Italy (2006, DG SANCO survey) and UK (national statistics 2006).

β Non-programme examinations: examinations performed and/or documented outside the framework of a screening programme, generally not distinguished from diagnostic examinations and in some cases involving age groups not eligible to attend screening.

~ Personal invitations issued to eligible women, generally by letter, but also subsequent to referral.

‡ Women for whom screening tests were performed in population-based or non-population-based programmes.

† Ages in parentheses only apply to some regions or differ from national recommendations.

f Dual status: women in national populations of Austria entered twice in table due to simultaneous programme activities of different type or status.

\*\* Austria: 903,647 non-population-based screening examinations reported for 2006 without specification of target cancer (e.g. breast, colorectal or prostate).

By the end of 2008, Austria plans to personally invite ca. 240,000 women to attend population-based breast screening pilots.

\*\* Belgium: Updated invitation data for 2006 provided by the Breast Screening Reference Centre, Brussels, Belgium.

\*\* Bulgaria: Preparation of National Cancer Control Strategy 2009-2019 deals with breast cancer screening programme.

\*\* Cyprus: Documentation system is currently being revised. Complete rollout confirmed by the Ministry of Health, Cyprus.

\*\* Czech Republic: Status changed to population-based in the year personal invitation was initiated (2007). 2006 participants estimated from 2007 data of national coordination office.

\*\* Denmark: As of 31 Dec. 2007 a nationwide screening programme based on 2-yearly mammography for women aged 50 to 69 years has been established. Volume data from 2001 pilot.

\*\* France: Opportunistic volume estimated from census report.

\*\* Greece: Non-population-based mammography screening currently available annually to publically insured women 40-50 years old, and 2-yearly to women over age 50. National statistics not available. Introduction of pop.-based mammography screening for women aged 50-69 foreseen in national cancer plan 2008-2012 which is under public consultation.

\*\* Hungary: No of non-programme screening examinations currently only available for 2005 (348,589) Complete programme rollout confirmed by Ministry of Health. Eligible target population significantly smaller than total target population due to exclusion of women with a mammogram in the previous 24 months.

\*\* Italy: Data shown for age group 50-69. Some regions invite women up to age 74.

\*\* Latvia: Adoption of National Cancer Control Programme and Action Plan (including actions for transition to 2-yearly population-based mammography screening for women aged 50-69 beginning in 2009) expected in October 2008.

\*\* Malta: A three-yearly mammography screening programme for women age 50-59 years will begin in 2008 and will be extended later to the age group 60-69 years.

\*\* Netherlands: No. of women invited and no. of women screened in 2006 updated from 2007 interim report of National Evaluation Team for breast cancer screening in the Netherlands.

\*\* Poland: Status changed to population-based in the year personal invitation was initiated (2007).

\*\* Portugal: Invitation and examination data 2006 for mainland from Portuguese Cancer League.

\*\* Slovenia: Rollout of nationwide population-based breast screening programme began in April 2008.

\*\* Spain: Eligible age to start screening 45 yrs. 6 regions, 50 yrs. In 12 regions. Eligible age to stop screening 64 yrs. in 7, 65 yrs. In 4, 67 yrs. In 1, 69 yrs. in 5, and 70 yrs. in 1 region. Total age-eligible national population estimated at 4,389,912 women in 2005 based on population statistics of the National Statistics Institute, Madrid.

\*\* Sweden: No centralized coordination, data accessible only at county level. 60-70% of counties start at age 40. Screening interval 18 months in age group 40-49. Thus total number of invited women in target group should not be divided by 2. Approx. 50% of counties invite age group 70-74. Target population estimated to be 100% of age group 50-69, + 50% of age groups 40-49 and 70-74. Complete rollout confirmed by Stockholm county screening coordination.

\*\* UK except Northern Ireland (target age group 50-70 years) 3-yearly, older women can request free 3-yearly screening.

\*\* UK - Northern Ireland (target age group 50-64) 3-yearly, older women can request free 3-yearly screening.

Additional footnotes: See Table 3a.

Table 4 a	Cervical Cancer Screening Programmes in the EU Member States 2007 Programme type, country implementation status and estimated no. of 30-60-year-old women in national target populations*							
	Cervical cancer screening programmes <sup>a</sup>							
	Population-based programmes		Non-pop.-based programmes		No programme		Totals	
	status	women (X 1000)	status	women (X 1000)	status	women (X 1000)	countries (N)	women (X 1000)
1	2	3	4	5	6	7	8	9
Austria			natw	1,850			1	1,850
Belgium			natw	2,280			1	2,280
Bulgaria**			natw	1,650			1	1,650
Cyprus					no prog	170	1	170
Czech Rep			natw	2,320			1	2,320
Denmark	natw-rollout cmp	1,140					1	1,140
Estonia	natw-rollout ong	290					1	290
Finland	natw-rollout cmp	1,130					1	1,130
France**			natw	13,000			1	13,000
	reg-pilot	560					1	560
Germany			natw	18,000			1	18,000
Greece			natw	2,450			1	2,450
Hungary	natw-rollout cmp	2,250					1	2,250
Ireland**	natw-plan	880					1	880
	reg-rollout cmp	80					1	80
Italy	natw-rollout ong	13,420					1	13,420
Latvia			natw	500			1	500
Lithuania			natw	750			1	750
Luxembourg			natw	110			1	110
Malta					no prog	90	1	90
Netherlands	natw-rollout cmp	3,670					1	3,670
Poland	natw-rollout ong	8,200					1	8,200
Portugal**	natw-plan	2,350					1	2,350
	reg-rollout ong	500					1	500
Romania	natw-pilot	4,700					1	4,700
	natw-plan	4,700					1	4,700
Slovak Republic			natw	1,200			1	1,200
Slovenia	natw-rollout cmp	450					1	450
Spain			reg	7,370			1	7,370
	reg-rollout cmp	560					1	560
Sweden**	natw-rollout cmp	1,870					1	1,870
UK	natw-rollout cmp	13,100					1	13,100
-Dual status <sup>f</sup>		-5,280					-3	-5,280
Subtotal	-	54,570	-	51,480	-	260	29	106,310
-Dual type <sup>f</sup>							-2	
<b>Total</b>		<b>54,570</b>		<b>51,480</b>		<b>260</b>	<b>27</b>	<b>106,310</b>

Abbreviations: **pop-b** (population-based), **non-pop-b** (non-population-based), **no prog** (no programme).

**natw** (nationwide) **rollout cmp** (rollout complete), **rollout ong** (rollout ongoing), **pilot** (piloting), **plan** (planning), **reg** (regional)

Sources: EC survey DG SANCO 2007, ECN / EUNICE projects, other sources see Table 4 b

\* 30-60-year-old women in national populations, adjusted for regional variation in eligible age and not including women in regions without screening programmes of a given type in countries with only regional programmes of the respective type

<sup>f</sup> Dual status: countries and women in national populations entered twice in table due to simultaneous programme activities of same type but different status (Ireland, Portugal and Romania).

<sup>f</sup> Dual type: Countries entered twice in table (France and Spain) due to simultaneous programme activities of different type. Total 30-60-year-old target populations of France and Spain entered only once in table (13.2 and 7.6 million, respectively).

\*\* Bulgaria: Preparation of National Cancer Control Strategy 2009-2019 deals with cervical cancer screening programme.

Additional footnotes: See next page and Table 4 b.

Table 4 a	Cervical Cancer Screening Programmes in the EU Member States 2007 Programme type, country implementation status and estimated no. of 30-60-year-old women in national target populations*							
	Cervical cancer screening programmes <sup>a</sup>							
	Population-based programmes		Non-pop.-based programmes		No programme		Totals	
	status	women (X 1000)	status	women (X 1000)	status	women (X 1000)	countries (N)	women (X 1000)
1	2	3	4	5	6	7	8	9
Number of member states and target populations by programme type, and status - population size in absolute numbers -								
<b>Nationwide</b>								
rollout complete	7	23,610	11	44,110			18	67,720
rollout ongoing	3	21,910					3	21,910
pilot & plan	1	4,700					1	4,700
planning	2	3,230					2	3,230
<b>Regional</b>								
rollout complete	2	640	1	7,370			3	8,010
rollout ongoing	1	500					1	500
piloting	1	560					1	560
<b>No Prog.</b>					2	260	2	260
<b>Totals</b>	<b>17</b>	<b>55,150</b>	<b>12</b>	<b>51,480</b>	<b>2</b>	<b>260</b>	<b>31</b>	<b>106,890</b>
<b>Adjustments</b>								
-Dual status <sup>f</sup>	2	580					2	580
<b>Subtotal</b>	<b>15</b>	<b>54,570</b>	<b>12</b>	<b>51,480</b>	<b>2</b>	<b>260</b>	<b>29</b>	<b>106,310</b>
-Dual type <sup>f</sup>			2				2	
+Excluded pop.~		336		2,010				2,346
<b>Adjusted totals</b>	<b>15</b>	<b>54,906</b>	<b>10</b>	<b>53,490</b>	<b>2</b>	<b>260</b>	<b>27</b>	<b>108,656</b>
Number of member states and target populations by programme type, and status - population size in % 30-60-year-old women in EU -								
<b>Nationwide</b>								
rollout complete	8	21.7%	11	40.6%			18	1
rollout ongoing	2	20.2%					3	20.2%
pilot & plan	1	4.3%					1	4.3%
planning	2	3.0%					2	3.0%
<b>Regional</b>								
rollout complete	2	0.6%	1	6.8%			3	7.4%
rollout ongoing	1	0.5%					1	0.5%
piloting	1	0.5%					1	0.5%
<b>No Prog.</b>					2	0.2%	2	0.2%
<b>Totals</b>	<b>17</b>	<b>50.8%</b>	<b>12</b>	<b>47.4%</b>	<b>2</b>	<b>0.2%</b>	<b>31</b>	<b>98.4%</b>
<b>Adjustments</b>								
-Dual status <sup>f</sup>	2	0.5%					2	0.5%
<b>Subtotal</b>	<b>15</b>	<b>50.2%</b>	<b>12</b>	<b>47.4%</b>	<b>2</b>	<b>0.2%</b>	<b>29</b>	<b>97.8%</b>
-Dual type <sup>f</sup>			2				2	
+Excluded pop.~		0.3%		1.8%				2.2%
<b>Adjusted totals</b>	<b>15</b>	<b>50.5%</b>	<b>10</b>	<b>49.2%</b>	<b>2</b>	<b>0.2%</b>	<b>27</b>	<b>100.0%</b>

~ 30-60-year-old women excluded from national target population in regions without screening programmes in country with regional implementation only (Spain) or in countries not targeting full age range 30-60 years.

<sup>f</sup> Dual status: See footnote in first page of table. Dual status of Romania not counted in second page of table due to joint category "Piloting and planning".

<sup>f</sup> Dual type: See footnote on first page of table.

\*\* France: Regional population-based pilot programmes are running in some regions.

\*\* Ireland: Regional population-based programme, nationwide implementation planned for 2008

\*\* Portugal: Invitation system introduced in central region 2007, nationwide rollout planned to begin 2008.

Additional footnotes: See previous page and Table 4 b.

Table 4 b	Annual volume of cervical cancer screening programmes in the EU Member States 2006 Women personally invited, women screened, screening interval, non-programme examinations, and total size of national target populations by programme status								
	Cervical cancer screening programmes <sup>a</sup>							Non-programme tests <sup>b</sup>	
	Programme		Age-eligible national population*		Screening interval	Personally invited~	Screened‡	Tests / yr (X 1000)	Age group (years)
	Type	Country status	Eligible age† (years)	Women (X 1000)	(years)	Women / yr (X 1000)	Women / yr (X 1000)		
1	2	3	4	5	6	7	8	9	10
Austria**	non-pop-b	natw	18+	3,510	1				
Belgium**	non-pop-b	natw	25-64	2,840	3		250		
Bulgaria**	non-pop-b	natw	31-65	1,890	2		246		
Cyprus**	no prog	no prog							
Czech Rep**	non-pop-b	natw	25-69	3,230	1	20			
Denmark*	pop-b	natw-rollout cmp	23-59	1,360	3 & 5		300		
Estonia	pop-b	natw-rollout ong	30-59	290	5	30	6	70	30-59
Finland**	pop-b	natw-rollout cmp	(25)30-60(65)	1,290	5	270	190		
France**	non-pop-b	natw	(20)25-65	16,300	3		4,630		
	pop-b	reg-pilot	(20)25(50)-65(74)	740	3				
Germany	non-pop-b	natw	20+	34,100	1		15,800	6000	
Greece	non-pop-b	natw	20+	4,580	1				
Hungary**	pop-b	natw-rollout cmp	25-65	2,950	3	690	45	960	
Ireland**	pop-b	natw-plan	25-60	1,080	3 & 5				
	pop-b	reg-rollout cmp	25-60	90	3 & 5	6	20		
Italy**	pop-b	natw-rollout ong	25-64	16,500	3	2,900	1,120		
Latvia**	non-pop-b	natw	20-70	820	3		120		
Lithuania**	non-pop-b	natw	30-60	750	3	100	90	126	
Luxembourg	non-pop-b	natw	15+	200	1		230		
Malta**	no prog	no prog						30	
Netherlands**	pop-b	natw-rollout cmp	30-60	3,670	5	780	500		
Poland**	non-pop-b	natw	25-59	9,740	3		370		
Portugal**	pop-b	natw-plan	25-64	2,990	3			266	all ages
	pop-b	reg-rollout ong	25-64	480	3	30	100	41	all ages
Romania	pop-b	natw-pilot	25-65	6,080	5		8		
Slovak Republic	non-pop-b	natw	18+	2,180	1			679	18+
Slovenia**	pop-b	natw-rollout cmp	20-64	630	3	90	200		
Spain**	non-pop-b	reg	(18)30(35)-59(65)	9,460	3 or 5				
	pop-b	reg-rollout cmp	(25)30-(50)65	630	3				
Sweden	pop-b	natw-rollout cmp	23-60	2,240	3 & 5		390	315	23-60
UK**	pop-b	natw-rollout cmp	(20)25-(60)64	16,400	3 & 5	4,370	4,000	1,165	25-75
-dual status <sup>f</sup>	pop-b			6,650					
Totals	--	--	--	146,450	--	9,290	28,620	9,650	--



#### Table 4 b. Annual volume of cervical cancer screening programmes in the EU member states 2006 - Footnotes

Abbreviations: **pop-b** (population-based), **non-pop-b** (non-population-based), and **no prog** (no programme).

**natw** (nationwide), **rollout cmp** (rollout complete), **rollout ong** (rollout ongoing), **pilot** (piloting), **plan** (planning).

Source: Survey EC survey DG SANCO 2007, additional status information from ECN / EUNICE projects. Other sources see below.

α Programmes using the screening test recommended in the Council Recommendation of December 2003: Pap smear.

\* Women in national populations, adjusted for national and regional variation in eligible age and not including women living in regions without screening programmes in countries only with regional implementation status. National population statistics from EUROSTAT 2007, except Finland (National Mass Screening Registry 12/2004), UK (national statistics) 2006), and pilot regions in France (National Cancer Institute, INCA, Paris)

β Non-programme Examinations: examinations performed and/or documented outside the framework of a screening programme, generally not distinguished from diagnostic examinations and in some cases involving age groups not eligible to attend screening

~ Personal invitations issued to eligible women, generally by letter, but also subsequent to referral

‡ Women for whom screening tests were performed in population-based or non-population-based programmes

† Ages in parentheses only apply to some regions or differ from national recommendations

f Dual status: Women 50-69 years in national populations of France, Ireland and Portugal entered twice in table due to simultaneous programme activities of different type or status

\*\* Austria: 903,647 screening examinations reported for 2006 without specification of target cancer (e.g. breast, cervical, colorectal or prostate)

\*\* Belgium: Some regional programmes use call/recall systems. Screening and diagnostic examinations and eligible age groups cannot be differentiated in the current data.

\*\* Bulgaria: The non-population-based screening programme includes annual prophylactic examinations covering various diseases. In women over 18 years a gynecological exam and cytological sampling (PAP smear) is recommended every 2 years. In 2007 1.16 million exams were performed, including ca. 246.000 PAP smears.

\*\* Cyprus: an ad hoc committee is developing plans for a nationwide population-based cervical cancer screening programme for women 30-60 years of age based on cytology.

\*\* Czech Republic: Invitation systems are being tested (20,000 personally invited and 5,000 screened women in addition to non-pop.-based examinations in 2006)

\*\* Denmark: Non-attenders are personally invited. National monitoring is currently being established. Complete rollout confirmed by national Ministry of Health. Screening volume 2006 estimated from coverage reported in EUNICE project for 2004-2006 for age group 25-59. Age range extended to 59 to 65 years as of 31 December 2007.

\*\* Finland: Size of target population and volume of examinations from Finnish Mass Screening Registry, 2005.

\*\* France: 2 of the 4 regional pop.-based pilots follow a different age range (20-65 and 50-74). In the rest of France, the target age is 25-65, with the exception of the overseas departments (20-65), therefore 25-65 age range used for estimation of target population outside pilot regions. Data for pilot regions from INCA, Paris

\*\* Greece: Publically insured, sexually active women entitled to annual Pap smear examination. Data not currently available from a loco-regionally organized programme serving certain areas of the Peloponnese. Introduction of pop.-based cervical cancer screening foreseen in National Cancer Plan 2008-2012 which is under public consultation.

\*\* Hungary: Low volume of screening examinations compared to invitations attributed by national authorities to incomplete follow-up data from professionals taking cervical samples.

\*\* Ireland: The regional population-based programme includes direct entry of eligible women. A nationwide population-based based programme will be implemented in 2008

\*\* Italy: Some programmes also invite women outside the age range 25-64. Data from Italian National Centre for Screening Monitoring

\*\* Latvia: Annual volume of examinations extrapolated from data of 2nd, 3rd and 4th quarter in 2005. Adoption of National Cancer Control Programme and Action Plan (including actions for transition to 3-yearly population-based cervical cytology screening for women) expected in October 2008.

\*\* Lithuania: Population-based monitoring and evaluation is implemented.

\*\* Malta: A significant volume of cervical cytological screening examinations is available in the public and the private health sector.

\*\* Poland: Personal invitations were not issued until 2007. Transition to pop-based programme in 2007

\*\* Portugal: Invitation system introduced in central region 2007, nationwide rollout planned to begin 2008.

\*\* Spain: Target population estimated for age range 25-65 in regions with non-population-based programmes

\*\* Sweden: Nos. and proportions of programme and non-programme examinations reported by Swedish National Board of Health and Welfare for 2002. Complete rollout confirmed by authors of recent national cervical screening audit: Andrea B, et al. (2008) JNCI 100: 622-629: doi:10.1093/jnci/djno99.

\*\* United Kingdom: targeted age and screened interval vary by region (England 3 yearly screening age 25-49 and 5 yearly age 50-64, Northern Ireland: 5 yearly age 20-64 Scotland: 3 yearly age 20-60); invited women not including Scotland. Volume data from NHS National Coordination Office, Coordination offices in Northern Ireland, Scotland and Wales Cervical Screening Programmes

\*\* UK-Northern Ireland: No. of women invited and no. of women screened not directly comparable due to recent change in invitation policy.

Additional footnotes: See Table 4a.

Table 5 a									
Colorectal Cancer Screening Programmes in the EU Member States 2007 Programme type, country implementation status and estimated no. of 50-74-year-old persons in national target populations*									
Colorectal cancer screening programmes <sup>a</sup>									
	Test	Population-based programmes		Non-population-based		No programme		Totals	
		status	persons (X 1000)	status	persons (X 1000)	status	persons (X 1000)	countries (N)	persons (X 1000)
1	2	2	3	4	5	6	7	8	9
Austria**	FOBT			natw	2,210			1	2,210
	CS			natw	2,210			1	2,210
Belgium						no prog	2,880	1	2,880
Bulgaria**				natw	2,340			1	2,340
Cyprus**	FOBT	natw-plan	10					1	10
	CS	natw-plan	10					1	10
Czech Rep	FOBT			natw	3,010			1	3,010
Denmark						no prog	1,540	1	1,540
Estonia						no prog	370	1	370
Finland	FOBT	natw-rollout ong	570					1	570
France	FOBT	natw-rollout ong	16,600					1	16,600
Germany**	FOBT			natw	24,500			1	24,500
	CS			natw	18,800			1	18,800
Greece	FOBT			natw	3,180			1	3,180
	CS			natw	3,180			1	3,180
Hungary	FOBT	natw-pilot	2,630					1	2,630
Ireland**						no prog	940	1	940
Italy	FOBT	natw-rollout ong	13,800					1	13,800
	FS	reg-rollout ong	80					1	80
Latvia	FOBT			natw	630			1	630
Lithuania						no prog	870	1	870
Luxembourg						no prog	120	1	120
Malta**						no prog	120	1	120
Netherlands**						no prog	4,460	1	4,460
Poland**	CS	natw-rollout ong	7,500					1	7,500
Portugal**	FOBT	natw-plan	2,520					1	2,520
Romania	FOBT	natw-plan	5,800					1	5,800
Slovak Republic	FOBT			natw	1,360			1	1,360
	CS			natw-plan	1,360			1	1,360
Slovenia**	FOBT	natw-plan	490					1	490
Spain**	FOBT	reg-pilot	210					1	210
Sweden**	FOBT	reg-plan	220					1	220
UK	FOBT	natw-rollout ong	7,600					1	7,600
-dual prog/test <sup>f</sup>			-80		-25,550			-6	-25,630
<b>Totals</b>			<b>57,960</b>		<b>37,230</b>		<b>11,300</b>	<b>27</b>	<b>106,490</b>

Abbreviations: **pop-b** (population-based), **no prog** (no programme), **natw** (nationwide) **rollout cmp** (rollout complete), **rollout ong** (rollout ongoing), **pilot** (piloting), **plan** (planning), **no prog** (no programme), **FOBT** (fecal occult blood test), **CS** (colonoscopy), **FS** (flexible sigmoidoscopy)

<sup>a</sup> Note: Only the FOBT is the test recommended by the Council of the European Union in 2003 (Annex 2).

Source: European Commission, 2007 (DG SANCO); IARC, 2007 (ECN and EUNICE projects); other sources see below.

\* 50-74-year-old women and men in the national population, adjusted for national and regional variation in eligible age and not including persons living in regions without screening programmes in countries with regional implementation status. National population statistics from EUROSTAT 2007, except, Italy, Spain, Sweden, UK (see Table 4 b).

<sup>f</sup> Dual programme status or test: women and men in national populations entered twice in table due to screening programmes of different implementation status or using different screening tests. Note that only in Cyprus is population targeted for endoscopic screening not in same age range targeted for FOBT screening.

Additional footnotes: see following page and Table 5 b.

<b>Table 5 a</b>		<b>Colorectal Cancer Screening Programmes in the EU Member States 2007 Programme type, country implementation status and estimated no. of 50-74-year-old persons in national target populations*</b>							
		Colorectal cancer screening programmes <sup>a</sup>							
Test	Population-based programmes		Non-population-based		No programme		Totals		
	status	persons (X 1000)	status	persons (X 1000)	status	persons (X 1000)	countries (N)	persons (X 1000)	
1	2	2	3	4	5	6	7	8	9
Number of member states and target populations by programme type, and status - population size in absolute numbers -									
<b>Nationwide</b>									
rollout complete§				7	37,230			7	37,230
rollout ongoing		5	46,070					5	46,070
piloting		1	2,630					1	2,630
planning		4	8,830	1	1,360			5	10,190
<b>Regional</b>									
piloting		1	210					1	210
planning		1	220					1	220
<b>No Prog</b>						8	11,300	8	11,300
<b>Totals</b>		<b>12</b>	<b>57,960</b>	<b>8</b>	<b>38,590</b>	<b>8</b>	<b>11,300</b>	<b>28</b>	<b>107,850</b>
<b>Adjustments</b>									
-Dual§ status/test f				1	1,360			1	1,360
<b>Subtotal</b>		<b>12</b>	<b>57,960</b>	<b>7</b>	<b>37,230</b>	<b>8</b>	<b>11,300</b>	<b>27</b>	<b>106,490</b>
+Excluded pop.~			29,500						29,500
<b>Adjusted totals</b>		<b>12</b>	<b>87,460</b>	<b>7</b>	<b>37,230</b>	<b>8</b>	<b>11,300</b>	<b>27</b>	<b>135,990</b>
Number of member states and target populations by programme type, and status - population size in % 50-74-year-old EU population -									
<b>Nationwide</b>									
rollout complete§				7	27.4%			7	27.4%
rollout ongoing		5	33.9%					5	33.9%
piloting		1	1.9%					1	1.9%
planning		4	6.49%	1	1.0%			5	7.5%
<b>Regional</b>									
piloting		1	0.2%					1	0.2%
planning		1	0.2%					1	0.2%
<b>No Prog</b>						8	8.3%	8	8.3%
<b>Totals</b>		<b>12</b>	<b>42.6%</b>	<b>8</b>	<b>28.4%</b>	<b>8</b>	<b>8.3%</b>	<b>28</b>	<b>79.3%</b>
<b>Adjustments</b>									
-Dual status/test f				1	1.0%			1	1.0%
<b>Subtotal</b>		<b>12</b>	<b>42.6%</b>	<b>7</b>	<b>27.4%</b>	<b>8</b>	<b>8.3%</b>	<b>27</b>	<b>78.3%</b>
+Excluded pop.~			21.7%						21.7%
<b>Adjusted totals</b>		<b>12</b>	<b>64.3%</b>	<b>7</b>	<b>27.4%</b>	<b>8</b>	<b>8.3%</b>	<b>27</b>	<b>100.0%</b>

§ Respective age-matched target populations of Austria, Germany, Greece, Italy and The Netherlands entered only once.

~ 50-74-year-old persons excluded from national target populations due to regional or national variation in the age group targeted for screening, or due to lack of screening programmes in some regions of countries with regional implementation status

\*\* Austria: women may elect to attend FOBT screening yearly, FOBT and colonoscopy screening are not mutually exclusive.

\*\* Bulgaria: Preparation of National Cancer Control Strategy 2009-2019 deals with colorectal cancer screening programme.

\*\* Cyprus: invitation of men and women aged 50 yrs. to FOBT screening, and 55 years to CS screening will begin in 2008.

\*\* Denmark: Results of an FOBT-based pilot study in 2005-2006 and international findings are being analyzed in a health technology assessment. Based on the HTA the National Board of Health will make a recommendation expected in June 2008 concerning nationwide colorectal screening programme.

Additional footnotes: see previous page and Table 5 b.

Table 5 b	Annual volume of colorectal cancer screening programmes in the EU member states 2006 Women and men personally invited, women and men screened, screening interval, non-programme examinations, and total size of national target populations by programme status									
	Colorectal cancer screening programmes <sup>a</sup>								Non-programme <sup>b</sup>	
	Programme		Test	Age-eligible national population*		Screening interval	Personally invited~	Screened ‡	Tests/yr (X 1000)	Age group (years)
	Type	Country status	Type	Eligible age† (years)	Persons (X 1000)	(years or times in LT)	Persons/yr (X 1000)	Persons/yr (X 1000)		
1	2	3	4	5	6	7	8	9	10	11
Austria**	non-pop-b	natw	FOBT	50+	2,860	1 or 2				
	non-pop-b	natw	CS	50+	2,860	10				
Belgium**	no prog	no prog								
Bulgaria**	non-pop-b	natw	FOBT	31+	5,940	1				
Cyprus**	pop-bas	natw-plan	FOBT	50	10	1 in LT				
	pop-bas	natw-plan	CS	55	10	1 in LT				
Czech Rep	non-pop-b	natw	FOBT	50+	3,670	2		240		
Denmark**	no prog	no prog								
Estonia	no prog	no prog								
Finland	pop-bas	natw-rollout ong	FOBT	60-69	570	2	25	17		
France**	pop-bas	natw-rollout ong	FOBT	50-74	16,590	2	2,670	1,120	550	
Germany**	non-pop-b	natw	FOBT	50+	31,410	1 & 2		6750		
	non-pop-b	natw	CS	55-74	18,840	10 (2 in LT)		610	1,000	
Greece	non-pop-b	natw	FOBT	50+	2,150	5				
	non-pop-b	natw	CS	50+	2,150	5				
Hungary	pop-bas	natw-pilot	FOBT	50-70	100	2	28	12		
Ireland**	no prog	no prog								
Italy**	pop-bas	natw-rollout ong	FOBT	50-69(70-75)	14,220	2	2,110	910		
	pop-bas	reg-rollout ong	FS	58 or 60	80	1 in LT	50	8		
Latvia	non-pop-b	natw	FOBT	50+	790	1			5	
Lithuania	no prog	no prog								
Luxembourg	no prog	no prog								
Malta**	no prog	no prog								
Netherlands**	no prog	no prog								
Poland**	pop-bas	natw-rollout ong	CS	50-65	7,500	10	41	32		
Portugal**	pop-bas	natw-plan	FOBT	50-70	2,520	2			130	
Romania	pop-bas	natw-plan	FOBT	50-74	5,800	2				
Slovak Republic	non-pop-b	natw	FOBT	50+	1,630					
	non-pop-b	natw-plan	CS	50+	1,630	10				
Slovenia**	pop-bas	natw-plan	FOBT	50-69	490	2				
Spain**	pop-bas	reg-pilot	FOBT	50-69	210	2	110	15		
Sweden**	pop-bas	reg-plan	FOBT	60-69	220	2				
UK	pop-bas	natw-rollout ong	FOBT	(50)60-69(74)	7,600	2	490	230		
-dual status or test f					-25,480					
Totals	--	--	--	--	106,900	--	5,525	9,944	1,685	--

**Table 5 b. Annual volume of colorectal cancer screening programmes in the EU member states - Footnotes**

Abbreviations - **pop-bas** (population-based), **non-pop-b** (non-population-based), **no prog** (no programme).

**rollout cmp** (rollout complete), **rollout ong** (rollout ongoing), **pop-b** (population-based) **pilot** (piloting), **plan** (planning), **reg** (regional), **no prog** (no programme).

**FOBT** (fecal occult blood test), **CS** (colonoscopy), **FS** (flexible sigmoidoscopy), **yr** (year), **LT** (lifetime)

$\alpha$  Note: Only the FOBT is the test recommended by the Council of the European Union in 2003 (Annex 2).

Source: European Commission, 2007 (DG SANCO); IARC, 2007 (ECN and EUNICE projects); other sources see below except Finland (national screening registry 12/2004),

\* Women and men in national populations, adjusted for national and regional variation in eligible age and not including persons living in regions without screening programmes in countries with regional or pilot implementation status. National population statistics from EUROSTAT 2007, except: Italy (Italian national screening observatory, 2006), Sweden (Stockholm Council cancer screening programme, 2007), UK (national statistics 2006)

$\beta$  Non-programme examinations: examinations performed and/or documented outside the framework of a screening programme, generally not distinguished from diagnostic examinations and in some cases involving age groups not eligible to attend screening

~ Personal invitations issued to eligible women, generally by letter, but also subsequent to referral

‡ Tests performed in population-based or non-population-based programmes

† Ages in parentheses only apply to some regions or differ from national recommendations

f Dual status or test: women and men in national populations entered twice in table due to screening programmes of different implementation status or using different screening tests.

Note that only in Cyprus is population targeted for endoscopic screening not in same age range targeted for FOBT screening.

Austria, Belgium, Cyprus, Denmark: see footnotes Table 5 a

\*\* Finland: Data from National Cancer Mass Screening Registry 2006

\*\* France: Data from 19 of 23 departments with active programme: average participation rate in 19 depts.: 42%

\*\* Germany: At age 55, FOBT screening interval changes from 1 to 2 years, and 2 screening colonoscopies in 10-year interval are offered as an alternative to FOBT. Persons electing to participate in CS screening are not eligible for FOBT screening.

\*\* Greece: Currently 5-yearly FOBT and/or CS screening covered by public insurance for persons age 50+. Statistics not available at national level in 2007.

Introduction of population-based, FOBT screening for age group 50-74 years foreseen in national cancer plan 2008-2012 which is currently under public consultation

\*\* Ireland: Expert committee has been appointed in 2007 to advise the national authorities on colorectal cancer screening

\*\* Italy: National colorectal cancer screening recommendation indicates 2 acceptable tests (FOBT or FS). Most programmes offer FOBT alone. 4 programmes offer only FS. 3 programmes offer FOBT to persons not accepting FS and in the age range 59-69.

\*\* Latvia: National Cancer Control Programme and Action Plan currently under development (expected adoption: October, 2008). Plan includes actions for transition to annual, population-based screening using FOBT for the age group 50+ years beginning in 2009.

\*\* Malta: colorectal cancer screening is included in draft national cancer control plan currently under consideration in Malta.

\*\* Netherlands: 3 pilot studies dealing with FOBT (Amsterdam and Nijmegen), FOBT and FS (Rotterdam) and CS (Maastricht) involving a total of over 30,000 subjects were running in 2007. Results will provide evidence for policy decision on nationwide implementation of screening.

\*\* Poland: In addition to asymptomatic men and women age 50-65 years, screening colonoscopy is offered to the following groups with elevated risk: persons age 40-65 who have a close family member who has been diagnosed with colorectal cancer, persons aged 25-65 with hereditary nonpolyposis colorectal cancer (HNPCC).

Size of target population entered in table corresponds to 50-65-year age group.

\*\* Portugal: Population-based screening will begin in the central region of Portugal early in 2008

\*\* Slovenia: Population-based screening will begin in Slovenia early in 2008

\*\* Spain: Routine implementation of colorectal cancer screening is not included in national cancer control plan, but loco-regional pilot programmes are running in some regions.

\*\* Sweden: population-based screening will begin in the Stockholm region early in 2008

\*\* UK: three regions (England, Scotland and Wales) serving over 95% of 50-74-year-old population in UK currently aim to implement population-based screening. Final decision pending in Northern Ireland although Dept. of Health plans to begin rollout before the end of 2008. Rollout in England began in 2006 (2-yearly FOBT, age 60-69), in Scotland in 2007 (2-yearly FOBT, age 50-74), will begin in Wales in 2008 (2-yearly FOBT, age 50-74). In England, residents 70+ years may request FOBT screening when programme reaches their region; phasing in of invitation to age 75 will begin in 2010. Due to current rollout phase, available data underestimate the volume of invitations and examinations performed in 2007. Estimates for England based on Dept. of Health Statistics Oct. 2007 for previous 12 months. Data not yet available from Scotland.

Additional footnotes: See Table 5a .

Table 6	Number of Persons attending Breast, Cervical and Colorectal Cancer Screening Programmes in the European Union in 2007 by Target Cancer and Programme Type							
	Persons attending screening programmes for							
	Breast Cancer		Cervical Cancer		Colorectal cancer		Total	
	persons (X 1000)	% of column	persons (X 1000)	% of column	persons (X 1000)	% of column	persons (X 1000)	% of column
1	2	3	4	5	6	7	8	9
<b>Population-based</b>	11,262	97%	7,791	25%	3,519	30%	22,572	41%
<b>Non-population-based</b>	343	3%	23,744	75%	8,120	70%	32,207	59%
<b>Total</b>	11,606	100%	31,535	100%	11,639	100%	54,780	100%

Source: European Commission, 2007 (DG SANCO); IARC, 2007 (ECN and EUNICE projects); other sources see Tables 3 b - 5 b.

\* Estimates of volume of screening in 2007. Volumes in Tables 3 b - 5 b corrected for programmes with missing data and for programmes in rollout phase in 2007.

# **Annexes**





# **ANNEX 1**

## **ECN & EUNICE PARTICIPANTS**



## **Annex 1: ECN and EUNICE participants**

Numerous experts have taken an active voluntary role in the European Cancer Network (ECN) and the European Network for Information on Cancer (EUNICE) by providing data on cancer screening. This data has been used to check the plausibility of, and to supplement the information provided by the EU Member States for the present report. The contributions of the network participants are gratefully acknowledged.

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## **ANNEX 2**

### **COUNCIL RECOMMENDATION OF 2 DECEMBER 2003 ON CANCER SCREENING**



## COUNCIL RECOMMENDATION

of 2 December 2003

on cancer screening

(2003/878/EC)

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty establishing the European Community, and in particular Article 152(4), second subparagraph, thereof,

Having regard to the proposal from the Commission,

Having regard to the opinion of the European Parliament,

Whereas:

- (1) Article 152 of the Treaty provides that Community action is to complement national policies and be directed towards improving public health, preventing human illness and diseases, and obviating sources of danger to human health. Such action shall cover the fight against the major health scourges, by promoting research into their causes, their transmission and their prevention, as well as health information and education. Community action in the field of public health shall fully respect the responsibilities of the Member States for the organisation and delivery of health services and medical care.
- (2) Further development of cancer screening programmes should be implemented in accordance with national law and national and regional responsibilities for the organisation and delivery of health services and medical care.
- (3) Cancer is a major disease and cause of death throughout Europe, including the future Member States. An estimated number of 1 580 096 new cancer cases, excluding non-melanoma skin cancer, occurred in the European Union in 1998. Of these, 1,4 % were cervical cancers, 13 % breast cancers, 14 % colorectal cancers and 9 % prostate cancers. Cervical and breast cancer constituted 3 % and 29 %, respectively, of new cancers in women. Prostate cancer constituted 17 % of new cancers in men.
- (4) Principles for screening as a tool for the prevention of chronic non-communicable diseases were published by the World Health Organisation in 1968 and by the Council of Europe in 1994. These two documents form, together with the current best practice in each of the cancer screening fields, the basis for the present recommendations.
- (5) Additionally, these recommendations are based on the 'Recommendations on cancer screening' of the Advisory Committee on Cancer Prevention together with the experience gathered under the different actions sustained under the Europe against Cancer programme where European collaboration has helped, for example, high quality cancer screening programmes to provide efficient European guidelines of best practice and to protect the population from poor quality screening.
- (6) Important factors which have to be assessed before a population-wide implementation is decided upon include, *inter alia*, the frequency and interval of the application of the screening test as well as other national or regional epidemiological specificities.
- (7) Screening allows detection of cancers at an early stage of invasiveness or possibly even before they become invasive. Some lesions can then be treated more effectively and the patients can expect to be cured. The main indicator for the effectiveness of screening is a decrease in disease-specific mortality. As in the case of cervical cancer, cancer precursors are detected, a reduction in cervical cancer incidence can be considered a very helpful indicator.
- (8) Evidence exists concerning the efficacy of screening for breast cancer and colorectal cancer, derived from randomised trials, and for cervical cancer, derived from observational studies.
- (9) Screening is, however, the testing for diseases of people for which no symptoms have been detected. In addition to its beneficial effect on the disease-specific mortality, screening can also have negative side effects for the screened population. Healthcare providers should be aware of all the potential benefits and risks of screening for a given cancer site before embarking on new population-based cancer screening programmes. Furthermore, for the informed public of today, these benefits and risks need to be presented in a way that allows individual citizens to decide on participation in the screening programmes for themselves.
- (10) Ethical, legal, social, medical, organisational and economic aspects have to be considered before decisions can be made on the implementation of cancer screening programmes.

- (11) Due account should be taken of specific needs of persons who may be at higher cancer risk for particular reasons (e.g. biological, genetic, lifestyle and environmental, including occupational).
- (12) The public health benefits and cost efficiency of a screening programme are achieved if the programme is implemented systematically, covering the whole target population and following best-practice guidelines.
- (13) The cost-effectiveness of cancer screening depends on several factors such as epidemiology, and healthcare organisation and delivery.
- (14) Systematic implementation requires an organisation with a call/recall system and with quality assurance at all levels, and an effective and appropriate diagnostic, treatment and after-care service following evidence-based guidelines.
- (15) Centralised data systems, including a list of all categories of persons to be targeted by the screening programme and data on all screening tests, assessment and final diagnoses, are needed to run organised screening programmes.
- (16) All procedures for collecting, storing, transmitting and analysing data in the medical registers involved must be in full compliance with the level of protection referred to in Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data <sup>(1)</sup>, as well as in full compliance with the relevant provisions of Member States on the management and processing of health data in accordance with Article 8 of the Directive.
- (17) Quality screening includes analysis of the process and outcome of the screening and rapid reporting of these results to the population and screening providers.
- (18) This analysis is facilitated if the screening database can be linked to cancer registries and mortality databases.
- (19) Adequate training of personnel is a prerequisite for high quality screening.
- (20) Specific performance indicators have been established for cancer screening tests. These should be monitored regularly.
- (21) Adequate human and financial resources should be available in order to assure the appropriate organisation and quality control in all the Member States.
- (22) Action should be taken to ensure equal access to screening taking due account of the possible need to target particular socioeconomic groups.
- (23) It is an ethical, legal and social prerequisite that cancer screening should only be offered to fully informed people with no symptoms if the screening is proved to decrease disease-specific mortality, if the benefits and risks are well known, and if the cost-effectiveness of the screening is acceptable.
- (24) The screening methods which presently meet these strict prerequisites are listed in the Annex.
- (25) No screening test other than those listed in the Annex is scientifically justified to be offered to people with no symptoms in an organised population-based programme before it has been shown in randomised controlled trials to decrease disease-specific mortality in particular.
- (26) The screening tests listed in the Annex can only be offered on a population basis in organised screening programmes with quality assurance at all levels, if good information about benefits and risks, adequate resources for screening, follow-up with complementary diagnostic procedures and, if necessary, treatment of those with a positive screening test are available.
- (27) The introduction of the recommended screening tests in the Annex, which have demonstrated their efficacy, should be seriously considered, the decision being based on available professional expertise and priority-setting for healthcare resources in each Member State.
- (28) Once there is evidence that a new screening test is effective, evaluation of modified tests may be possible using other epidemiologically validated surrogate endpoints if the predictive value of these endpoints is established.
- (29) Screening methodologies are subject to ongoing development. The application of recommended screening methodologies should therefore be accompanied by simultaneous assessments of the quality, applicability and cost-effectiveness of new methods if available epidemiological data justify this. In fact, the ongoing work may lead to new methods, which could ultimately replace or complement the tests listed in the Annex or be applicable to other types of cancer.

<sup>(1)</sup> OJ L 281, 23.11.1995, p. 31.

HEREBY RECOMMENDS THAT MEMBER STATES:

#### 1. Implementation of cancer screening programmes

- (a) offer evidence-based cancer screening through a systematic population-based approach with quality assurance at all appropriate levels. The tests which should be considered in this context are listed in the Annex;
- (b) implement screening programmes in accordance with European guidelines on best practice where they exist and facilitate the further development of best practice for high quality cancer screening programmes on a national and, where appropriate, regional level;
- (c) ensure that the people participating in a screening programme are fully informed about the benefits and risks;
- (d) ensure that adequate complementary diagnostic procedures, treatment, psychological support and after-care following evidence-based guidelines of those with a positive screening test are provided for;
- (e) make available human and financial resources in order to assure appropriate organisation and quality control;
- (f) assess and take decisions on the implementation of a cancer screening programme nationally or regionally depending on the disease burden and the healthcare resources available, the side effects and cost effects of cancer screening, and experience from scientific trials and pilot projects;
- (g) set up a systematic call/recall system and quality assurance at all appropriate levels, together with an effective and appropriate diagnostic and treatment and after-care service following evidence-based guidelines;
- (h) ensure that due regard is paid to data protection legislation, particularly as it applies to personal health data, prior to implementing cancer screening programmes.

#### 2. Registration and management of screening data

- (a) make available centralised data systems needed to run organised screening programmes;
- (b) ensure by appropriate means that all persons targeted by the screening programme are invited, by means of a call/recall system, to take part in the programme;
- (c) collect, manage and evaluate data on all screening tests, assessment and final diagnoses;
- (d) collect, manage and evaluate the data in full accordance with relevant legislation on personal data protection.

#### 3. Monitoring

- (a) regularly monitor the process and outcome of organised screening and report these results quickly to the public and the personnel providing the screening;
- (b) adhere to the standards defined by the European Network of Cancer Registries in establishing and maintaining the screening databases in full accordance with relevant legislation on personal data protection;
- (c) monitor the screening programmes at adequate intervals.

#### 4. Training

adequately train personnel at all levels to ensure that they are able to deliver high quality screening.

#### 5. Compliance

- (a) seek a high level of compliance, based on fully informed consent, when organised screening is offered;
- (b) take action to ensure equal access to screening taking due account of the possible need to target particular socioeconomic groups.

#### 6. Introduction of novel screening tests taking into account international research results

- (a) implement new cancer screening tests in routine healthcare only after they have been evaluated in randomised controlled trials;
- (b) run trials, in addition to those on screening-specific parameters and mortality, on subsequent treatment procedures, clinical outcome, side effects, morbidity and quality of life;
- (c) assess level of evidence concerning effects of new methods by pooling of trial results from representative settings;
- (d) consider the introduction into routine healthcare of potentially promising new screening tests, which are currently being evaluated in randomised controlled trials, once the evidence is conclusive and other relevant aspects, such as cost-effectiveness in the different healthcare systems, have been taken into account;
- (e) consider the introduction into routine healthcare of potentially promising new modifications of established screening tests, once the effectiveness of the modification has been successfully evaluated, possibly using other epidemiologically validated surrogate endpoints.

**7. Implementation report and follow-up**

report to the Commission on the implementation of this Recommendation within three years of its adoption and subsequently at the request of the Commission with a view to contributing to the follow-up of this Recommendation at Community level.

HEREBY INVITES THE COMMISSION:

1. To report on the implementation of cancer screening programmes, on the basis of the information provided by Member States, not later than the end of the fourth year after the date of adoption of this Recommendation, to consider the extent to which the proposed measures are working effectively, and to consider the need for further action.

2. To encourage cooperation between Member States in research and exchange of best practices as regards cancer screening with a view to developing and evaluating new screening methods or improving existing ones.
3. To support European research on cancer screening including the development of new guidelines and the updating of existing guidelines for cancer screening.

Done at Brussels, 2 December 2003.

*For the Council*

*The President*

R. MARONI

## ANNEX

## SCREENING TESTS WHICH FULFIL THE REQUIREMENTS OF THE RECOMMENDATION (\*):

- pap smear screening for cervical cancer precursors starting not before the age of 20 and not later than the age of 30;
  - mammography screening for breast cancer in women aged 50 to 69 in accordance with European guidelines on quality assurance in mammography;
  - faecal occult blood screening for colorectal cancer in men and women aged 50 to 74.
- 

(\*) The indicated age ranges are to be understood as maximum ranges; subject to national epidemiological evidence and prioritisation, smaller age ranges may be appropriate.





## **ANNEX 3**

### **QUESTIONNAIRE ON IMPLEMENTATION OF CANCER SCREENING IN THE EU MEMBER STATES**

**SENT IN MAY 2007**

**BY THE**

**EUROPEAN COMMISSION, DIRECTORATE-GENERAL  
FOR HEALTH AND CONSUMERS**

**TO THE**

**EU REPRESENTATIONS OF THE 27 MEMBER STATES**



**I. Role of cancer screening in national cancer control programmes**

**1. Does your country have a national cancer control programme**

- yes
- no
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)

**2. How is breast cancer screening anchored in your country's cancer control programme?**

- not included
- included
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)

**3. How is cervical cancer screening anchored in your country's cancer control programme?**

- not included
- included
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)

4. **How is colorectal cancer screening anchored in your country's cancer control programme?**

- not included
- included
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)

## **II. Questions for quantitative description of cancer screening in the Member States**

For comparability between countries, please report on the screening policy in your country at the end of the first 3-year reporting period, i.e., in 2006. If a relevant change in the situation has occurred in 2007, please comment on that separately, after answering the respective question based on the situation in 2006.

Please provide statistical information based on the 12-month period January to December 2005. If data is only available for an earlier period, please indicated that separately. If statistical data is available for 2006, please also report that data separately.

### **Quantitative description of Target Groups**

In the Annex of Council Recommendation (2003/878/EC) three screening tests are listed to be offered to three different population groups at risk for cervical, breast and colorectal cancer.

#### **5. Target cancers and target populations**

In 2006, did your country offer screening to the following target populations?

Please indicate any differences between the Council recommendation and the age groups targeted for screening in your country.

Please also indicate any differences in the screening test offered and/or in the disease targeted for screening (e.g. prostate or lung cancer screening).

##### **a) cervical cancer screening by offering the Pap test to women aged 20 and older?**

Policy in your country: (add extra text as necessary)

##### **b) breast cancer screening by offering mammography to women aged 50 to 69, in accordance with European guidelines on quality assurance in mammography screening?**

Policy in your country: (add extra text as necessary)

##### **c) colorectal cancer screening by offering the faecal occult blood test to men and women aged 50 to 74?**

Policy in your country: (add extra text as necessary)

- d) screening for any other cancer not covered by 4 a) to 4 c) which your country offers to persons of average risk.  
Please give target population and screening test for each additionally targeted cancer**

Policy in your country: (add extra text as necessary) \_\_\_\_\_

**Quantitative description of organised screening programmes**

- 6. In the year 2005, how many men and women of the respective population groups in your Member State which are targeted for screening (see your answers to question 5 a) to 5 d)) were personally invited to attend the respective screening programmes?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006 please also provide these data.

**Quantitative description of compliance with organised screening programmes**

- 7. In 2005, How many men and women of the respective target population in your Member State to which the screening tests mentioned in 5 a) to 5 d) were offered by personal invitation, complied with and participated in screening programme?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006 please also provide these data.

**Volume of organised screening programmes**

- 8. In 2005, how many of the screening tests mentioned in 5 a) to 5 d) were offered by personal invitation and performed for men and women of the respective population group in your Member State?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006 please also provide these data.

**Public costs of organised screening programmes**

- 9. In 2005, how much has been paid by public authorities and/or health insurances for the screening tests mentioned in 5 a) to 5 d) offered within organised screening programmes?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006 please also provide these data.

**Quantitative description of opportunistic screening**

**10. In 2005, how many men and women of the respective population group in your Member State are offered screening without systematic invitation for the tests mentioned in 5 a) to 5 d)?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006, please also provide these data.

**Volume of opportunistic screening**

**11. In 2005, how many of the screening tests mentioned in 5 a) to 5 d) were provided for men and women of the respective population group in your Member State outside of an organised screening programme?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006, please also provide these data.



**Public costs of opportunistic screening**

**12. In 2005, how much has been paid by public authorities and/or health insurances for the screening tests mentioned in 5 a) to 5 d) outside of an organised screening programme ?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006, please also provide these data.

**Private costs of screening on demand**

**13. In 2005, how much has been paid privately by individuals for the screening tests mentioned in 5 a) to 5 d) outside of an organised screening programme?**

Please provide data separately for a) to d) and broken down by men and women and by five-year age groups

If data are available for 2006, please also provide these data.

**III. Questions regarding details of national implementation of the Council recommendation on cancer screening**

Please tick the appropriate reply and/or give your comment where necessary

Implementation of cancer screening programmes

**14. Is evidence-based cancer screening offered in your country through a systematic population-based approach with quality assurance at all appropriate levels, especially by performing the following tests:**

— pap smear screening for cervical cancer precursors starting not before the age of 20 and not later than the age of 30;

- yes
- no
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)

— mammography screening for breast cancer in women aged 50 to 69 in accordance with European guidelines on quality assurance in mammography;

- yes
- no
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)

— faecal occult blood screening for colorectal cancer in men and women aged 50 to 74.

- yes
- no
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)

**15. Is the breast cancer screening programme implemented in accordance with European guidelines for quality assurance in breast cancer screening and diagnosis – 4<sup>th</sup> edition;**

- yes
- no
- unknown/not applicable

If not, please state the reasons:

If yes, please provide further detail: (brief description of key aspects, information sources, etc.)

.....

**16. Are people participating in a screening programme fully informed about related benefits and risks?**

- yes
- no
- unknown/not applicable

If yes, how do you ensure their being informed?

.....

If not, what are the reasons for this situation?

.....

**17. Are adequate complementary diagnostic procedures, treatment, psychological support and after-care following evidence-based guidelines provided for patients with a positive screening test?**

- yes
- no
- unknown/not applicable

If not, please state the reasons

.....

If yes, please provide further detail: (brief description of key aspects, information sources, etc.)  
.....

**18. Are human and financial resources made available in order to assure appropriate organisation and quality control?**

- yes
- no
- unknown/not applicable

Are these resources satisfactory?

- yes
- no
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)  
.....

**19. Before decisions on the implementation of a cancer screening programme have been taken on the national or regional level have the following factors been assessed?**

disease burden and the healthcare resources available

- yes
- no
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)  
.....

side effects and cost effects of cancer screening

- yes
- no
- unknown/not applicable

Please provide further detail: (brief description of key aspects, information sources, etc.)  
.....

experience from scientific trials and pilot projects

- yes
- no
- unknown/not applicable

If yes, please provide further detail: (brief description of key aspects, information sources, etc.)

.....

If not, please state the reasons

.....

**20. Has a systematic call/recall system and quality assurance been set up at all appropriate levels, together with an effective and appropriate diagnostic and treatment and after-care service following evidence-based guidelines?**

- yes
- no
- unknown/not applicable

If yes, please provide further detail: (brief description of key aspects, information sources, etc.)

.....

If not, describe what were the reasons and what has been achieved

.....

**21. Is due regard paid to European data protection legislation, particularly as it applies to personal health data, prior to implementing cancer screening programmes?**

- yes
- no
- unknown/not applicable

If yes, please provide further detail: (brief description of key aspects, information sources, etc.)

.....

If not, please state the reasons

.....

**Registration and management of screening data**

**22. Are centralised data systems made available to run the organised screening programmes?**

yes

If yes, please give examples of such data systems

.....

no

If not, please state the reasons

.....

unknown/not applicable

**23. Are all persons targeted by the screening programme invited, by means of a call/recall system, to take part in the programme?**

yes

If yes, please give examples of such data systems

.....

no

If not, please state the reasons

.....

by other means (describe how):

.....

unknown/not applicable

**24. Are data on all screening tests, assessment and final diagnoses collected, managed and evaluated?**

yes

If yes, please provide additional information, e.g., key aspects, sources of information, etc.

If only partially, please add additional explanatory comment

.....

no

If not, please state the reasons

.....

unknown/not applicable

**25. Are data collected, managed and evaluated in full accordance with relevant European legislation on personal data protection?**

yes

If yes, please provide additional information, e.g., key aspects, sources of information, etc.

no

If not, please explain what are the obstacles

.....

unknown/not applicable

**Monitoring**

**26. Is the process and outcome of organised screening regularly monitored by an independent peer review?**

- yes
- no
- unknown/not applicable

Please provide additional information, e.g., key aspects, sources of information, etc.

and are these results reported quickly to the public and the personnel providing the screening

- yes

If yes, please provide additional information, e.g., key aspects, sources of information, etc.

- no

If not, please state the reasons

.....  
..

- unknown/not applicable

**27. Does your country adhere to the standards defined by the European Network of Cancer Registries in establishing and maintaining the screening databases in full accordance with relevant European legislation on personal data protection?**

- yes
- no
- unknown/not applicable

Please provide additional information, e.g., key aspects, sources of information, etc.



**28. Are screening programmes monitored by national cancer registries at adequate intervals?**

yes

If yes, please provide additional information, e.g., key aspects, sources of information, etc.

no

If not, please state the reasons and describe what should be the level attained

.....  
..

unknown/not applicable

**Training**

**29. Is personnel adequately trained at all levels to ensure that they are able to deliver high quality screening**

yes

Please describe how this is achieved

.....

no

Please state the reasons

.....

unknown/not applicable

**Compliance**

**30. When organised screening is offered is a high level of compliance treated as a priority, based on fully informed consent**

yes

Please describe how this is achieved

.....

no

If not, please state the reasons

.....

unknown/not applicable

**31. Is any action taken to ensure equal access to screening taking due account of the possible need to target particular socioeconomic groups?**

yes

no

unknown/not applicable

If yes, please give examples of undertaken actions

.....

**Introduction of novel screening tests taking into account international research results**

**32. Are new cancer screening tests in routine healthcare implemented only after having been evaluated in randomised controlled trials?**

- yes
- no
- unknown/not applicable

If not, please describe the measures which are undertaken

.....

**33. Does your country run trials, in addition to those on screening-specific parameters and mortality, on subsequent treatment procedures, clinical outcome, side effects, morbidity and quality of life?**

- yes
- no
- unknown/not applicable

on which of the following:

- subsequent treatment procedures
- clinical outcome
- side effects
- morbidity
- quality of life

**34. Is the level of evidence concerning the effects of new methods assessed by pooling of trial results from representative settings;**

- yes
- no
- unknown/not applicable

If yes, give some examples

.....

**35. Does your country consider to introduce or has it introduced potentially promising new screening tests, which are currently being evaluated in randomised controlled trials into routine healthcare, once the evidence is conclusive and after having taken into account other relevant aspects, such as cost-effectiveness in the different healthcare systems**

yes

If yes, please provide additional details, e.g. key aspects, sources of information, etc.

no

If not, please state the reasons.

.....

unknown/not applicable

**36. Does your country consider to introduce potentially promising new modifications of established screening tests, once the effectiveness of the modification has been successfully evaluated, into routine healthcare, possibly using other epidemiologically validated surrogate endpoints?**

yes

no

unknown/not applicable

If not, please state the reasons.

.....

## **ANNEX 4**

### **NON-EXHAUSTIVE LIST OF RELEVANT ACTIONS TAKEN BY INDIVIDUAL MEMBER STATES SINCE 2003**

**THE YEAR IN WHICH THE  
COUNCIL RECOMMENDATION ON CANCER SCREENING  
WAS ADOPTED**

**Annex 4: Non-exhaustive list of relevant actions taken by individual Member States since 2003, the year in which the Council Recommendation on Cancer Screening was adopted**

No.	Country	Breast cancer screening	Cervical cancer screening	Colorectal cancer screening	Screening in general
1	<b>Austria</b>	Planning and implementation of population-based breast cancer screening programmes based on mammography	Testing of invitation systems for annual PAP smear	Optional screening colonoscopy (10-year interval) added to catalogue of non-population-based screening examinations (in addition to previously offered annual or biennial FOBT)	
2	<b>Belgium</b>		Initiatives are being taken at the regional and loco-regional level to promote implementation of cervical cancer screening according to the European recommendations	Initiatives are being taken at the regional and loco-regional level to promote implementation of colorectal cancer screening according to the European recommendations	
3	<b>Bulgaria</b>	Breast cancer screening programme is being dealt with in 2008 in preparations for National Cancer Control Strategy 2009-2019	Cervical cancer screening programme is being dealt with in 2008 in preparations for National Cancer Control Strategy 2009-2019	Colorectal cancer screening programme is being dealt with in 2008 in preparations for National Cancer Control Strategy 2009-2019	National Cancer Control Strategy 2009-2019 is being developed in 2008
4	<b>Cyprus</b>	Recent initiatives in 2007 to fulfil standards and recommendations of EU guidelines (upgrading computerised documentation and monitoring system, and expert consultations to prepare programme certification).		Population-based colorectal cancer screening programme adopted in 2007. Invitation of 50-yr.-old men and women to FOBT screening, and 55-year-old men and women to colonoscopy screening will begin in 2008	
5		Rollout of population-based breast screening programme completed in Greek-Cypriot part of country.			
6	<b>Czech Republic</b>	Conversion of non-population-based, to population-based breast cancer screening programme started in 2007 (rollout of personal invitation to initial screening and personal re-invitation to subsequent screening)	Testing of invitation systems for cervical cancer screening		

No.	Country	Breast cancer screening	Cervical cancer screening	Colorectal cancer screening	Screening in general
7	<b>Denmark</b>	As of 31 December 2007 a nationwide screening programme based on 2-yearly mammography for women aged 50 to 69 years has been established in all five regions of the country which are responsible for the secondary health sector.	As of 31 December 2007 the upper age limit for the population-based nationwide screening programme has been extended from 59 to 65 years.	An FOBT-based pilot study of colorectal cancer screening was performed 2005-2006.	
8		National guidelines for breast cancer screening are being drafted in 2008.	A national cervical cancer screening registry is being established in 2008	An ongoing HTA was initiated in 2007 to analyze the pilot results and international results and to inform an impending recommendation of the National Board of Health on introduction of a nationwide colorectal cancer screening programme.	
9		National monitoring of the breast cancer screening programme is in preparation in 2008.	National monitoring of the cervical cancer screening programme is in preparation in 2008		
10	<b>Estonia</b>	Rollout of nationwide population-based breast cancer screening completed.	Conversion of non-population-based cervical cancer screening to a population-based programme initiated and completed.		
11	<b>Finland</b>	Start of extension of upper age limit for invitation to population-based breast cancer screening from 59 or 64, to 69 years in all regions of the country. Extension to age 69 will be phased in gradually over the coming years.		Start of nationwide, population-based colorectal cancer screening programme using FOBT and according to a randomised public health intervention design. Rollout is currently ongoing.	
12	<b>France</b>	Revised organisation and procedures and eligible age range (50-74 years) of nationwide, population-based breast cancer screening programme	Population-based pilot programmes of cervical cancer screening established in four regions.	Nationwide population-based programme for colorectal cancer screening based on FOBT initiated. Rollout is currently ongoing.	

No.	Country	Breast cancer screening	Cervical cancer screening	Colorectal cancer screening	Screening in general
13	<b>Germany</b>	Adoption and initiation of rollout of nationwide population-based breast cancer screening programme based on EU guidelines	Pilot projects to improve quality and effectiveness of cervical cancer screening initiated.	Nationwide campaigns to promote non-population-based colonoscopy screening for colorectal cancer	
14	<b>Greece</b>	Introduction of pop.-based cervical cancer screening foreseen in National Cancer Plan 2008-2012 which is under public consultation.	Introduction of pop.-based cervical cancer screening foreseen in National Cancer Plan 2008-2012 which is under public consultation	Introduction of pop.-based cervical cancer screening foreseen in National Cancer Plan 2008-2012 which is under public consultation	National Cancer Plan 2008-2012 has been developed and is under public consultation in 2008. Includes provisions designed to follow Council Recommendation
15	<b>Hungary</b>	Completion of rollout of nationwide population-based mammography screening.		Piloting of population-based colorectal cancer screening using FOBT.	
16	<b>Ireland</b>	Rollout of the population-based breast screening programme to the southern and western regions of the country.	Planning and preparation for 2008 introduction of nationwide population-based cervical screening programme	Appointment of expert committee to advise the national authorities on colorectal cancer screening	
17	<b>Italy</b>	Rollout of population-based breast screening programmes expanded continuously. By 2006, 77% of the target population in Italy resided in areas in which population-based breast screening programmes were active. In 2007 in all Italian regions, at least one pilot population-based breast screening programme was implemented.	Rollout of population-based cervical cancer screening programmes expanded continuously. By 2006 approximately 70% of the Italian target population resided in areas served by active cervical screening programmes.	Rollout of population-based colorectal cancer screening programmes expanded continuously. By 2006 approximately 45% of the Italian target population resided in areas served by active population-based colorectal cancer screening programmes.	In 2004, the National Parliament allocated 52 million € to address the uneven distribution of cancer screening services in Italy
18					Subsequently, the National Prevention Plan 2005-2007 was established and implementation has been coordinated by national authorities promoting monitoring, evaluation and networking between local and regional breast, cervical and colorectal cancer screening programmes.
19					In 2005 the National Centre for Screening Monitoring, linked with the Centre of Disease Control (CCM) of the Ministry of Health was established.



<b>No.</b>	<b>Country</b>	<b>Breast cancer screening</b>	<b>Cervical cancer screening</b>	<b>Colorectal cancer screening</b>	<b>Screening in general</b>
20	<b>Latvia</b>	Nationwide non-population-based breast cancer screening has been established in 2005	Nationwide non-population-based cervical screening has been established in 2005	Nationwide non-population-based colorectal cancer screening has been established in 2005	Cabinet decision in December 2006 to develop a National Cancer Control Programme and Action Plan
21		Actions for transition to population-based breast cancer screening programme with 2-yearly mammography screening for women aged 50-69 have been incorporated into National Cancer Control Programme which is under development in 2008.	Actions for transition to population-based cervix cancer screening programme have been incorporated into National Cancer Control Programme which is under development in 2008.	Actions for transition to population-based colorectal cancer screening programme have been incorporated into National Cancer Control Programme which is under development in 2008.	2008 final preparations for adoption of National Cancer Control Programme and Action Plan (expected date of adoption: Oct. 2008, expected date to take effect: 1 Jan 2009)
22	<b>Lithuania</b>	Nationwide non-population-based breast cancer screening established	Nationwide non-population-based cervical cancer screening established.		
23		Methods developed for population-based monitoring of breast cancer screening.	Methods developed for population-based monitoring of cervical cancer screening.		
24	<b>Malta</b>	In 2007, national authorities decided to begin implementation of a population-based breast screening programme. Three-yearly mammography, age 50-59, extension later to age 69) will be provided in 2008.			
25	<b>The Netherlands</b>	Upper age limit of invitation to population-based breast cancer screening extended from 69 to 75 years	Development of national guidelines for implementation of HPV testing in nationwide population-based cervical cancer screening programme	Pilot studies employing FOBT and flexible sigmoidoscopy as screening tests for colorectal cancer have been conducted. The results and experience will be taken into account in the decision-making process on nationwide programme implementation.	
26		Central coordination of nationwide transition of breast cancer screening programme from conventional to digital mammography			

<b>No.</b>	<b>Country</b>	<b>Breast cancer screening</b>	<b>Cervical cancer screening</b>	<b>Colorectal cancer screening</b>	<b>Screening in general</b>
27	<b>Poland</b>	Nationwide population-based programme for breast cancer screening initiated (rollout currently ongoing).	Nationwide population-based programme for cervical cancer screening initiated (rollout currently ongoing).	Colorectal cancer screening based on colonoscopy piloted.	
28				Nationwide population-based programme for colorectal cancer screening initiated (rollout currently ongoing)..	
29	<b>Portugal</b>	Coverage of nationwide population-based breast cancer screening increased by extending screening to more regions and areas.	Invitation system for population-based cervical cancer screening introduced in the central region of the country. Nationwide rollout to begin in 2008.	Planning and preparation of population-based colorectal cancer screening completed in 2007. Screening will begin in the central region of Portugal in 2008.	
30	<b>Romania</b>	Screening Executive Agency initiated planning in 2007 for nationwide, population-based colorectal cancer screening programme (2-yearly FOBT for men and women age 50-74).	Screening Executive Agency initiated planning in 2007 for nationwide, population-based cervical screening programme (5-yearly cervical cytology for women age 25-64).	Screening Executive Agency initiated planning in 2007 for nationwide, population-based colorectal cancer screening programme (2-yearly FOBT for men and women age 50-74).	Executive Agency for Screening, establishment at Ministry of Health in 2007
31			Completion of a regional pilot of population-based cervical cancer screening		
32	<b>Slovak Republic</b>	National guidelines including quality control of mammography equipment based on the European guidelines have been issued for the nationwide, non-population-based breast cancer screening programme.		A nationwide, non-population-based colorectal cancer screening programme is currently in the planning phase.	
33	<b>Slovenia</b>	Planning and organisational, professional and scientific preparation of nationwide population-based breast cancer screening programme. Rollout beginning in the first half of 2008.		Planning and organisational, professional and scientific preparation of nationwide population-based colorectal cancer screening programme. Rollout beginning in the first half of 2008.	

<b>No.</b>	<b>Country</b>	<b>Breast cancer screening</b>	<b>Cervical cancer screening</b>	<b>Colorectal cancer screening</b>	<b>Screening in general</b>
34	<b>Spain</b>		Population-based cervical cancer screening programmes established in two regions.	Pilot programmes for colorectal cancer screening established in three regions.	Establishment of national breast screening network for exchange of information and experience
35	<b>Sweden</b>	Revised national mammography screening recommendations (full age range 40-74 years now recommended without exception).	Comprehensive auditing of population-based cervical cancer screening services initiated.	Regional population-based colorectal cancer screening programme planned in Stockholm region. Programme start in January 2008.	
36	<b>United Kingdom</b>	Upper age limit of population-based invitation to breast cancer screening extended from 64 to 70 years. Women over 70 years can request invitation.		Conventional cytology replaced by liquid-based cytology in the national cervical cancer screening programme.	Population-based colorectal cancer screening using the FOBT has been piloted and subsequently rolled out in England and Scotland. FOBT screening programme has been adopted in Wales, with final decision in Northern Ireland pending.



## **ANNEX 5**

### **QUALITATIVE FEEDBACK FROM THE MEMBER STATES ON IMPLEMENTATION OF THE COUNCIL RECOMMENDATION**

**Annex 5: Cancer Screening in the European Union - Qualitative Description**

Council Recommendations	1. Implementation of cancer screening programmes - key aspects												2. Screening data registration & management				3. Screening programmes monitoring				
	1a1	1a2	1a3	1b	1c	1d	1e-q1	1e-q2	1f1	1f2	1f3	1g	1h	2a	2b	2c	2d	3a1	3a2	3b	3c
	Population-based screening with QA at all appropriate levels using			EU breast guidelines	Fully informed	Adequate care for	Human & finan. resources for organisation & QC		Implementation decisions based on			Call/ Recall, effective	Data protection	Centralised data systems	Call/ recall system	Collect, manage & evaluate data	Data handling in full accordance	Regular monitoring of process & outcome of organised screening		ENCR screening data base standards & EU laws	National cancer registries monitor programme
EC Questionnaire	14a	14b	14c	15	16	17	18a	18b	19a	19b	19c	20	21	22	23	24	25	26a	26b	27	28
	PAP	Mx	FOBT	Followed		Screen-positives	Provided	Adequate	Disease burden & health resources	Side effects/ cost-effectvtn.	Sci. trials/pilots	Diagn. treatm. After care		For running programmes	To invite all targeted persons	On test, assessment, diagnosis	With data protection legislation	By independent peer review	With quick reports to public and staff	On data protection fully followed	At adequate intervals
Austria	N*	Y#	N#	Y	Y	Y	N	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	N*	N
Belgium	N	Y	N#	Y	Y#	Y#	Y#	Y#	Y#	Y#	Y#	Y#	Y	Y	Y	Y	Y	Y#	Y#	Y#	N
Bulgaria																					
Cyprus	N	Y	N	Y	Y	Y	Y	Y	Y	MV	N	Y	Y	Y#	Y	Y#	Y	N	MV	Y	N
Czech Rep	N	Y	N#	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	MV	Y	Y
Denmark																					
Estonia	Y	Y	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	N*	N
Finland																		Y	Y	Y	N*
France	N#	Y	Y	Y	Y	N*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y				
Germany	N#	Y	N#	Y	Y	Y	Y	Y	Y	Y	Y	Y#	Y	Y	Y#	Y#	Y#	Y#	Y#	Y	Y#
Greece				N#	Y	Y#	Y#	MV	MV	MV	MV	Y#	Y#	Y	Y#	Y#	Y#	Y#	y#	Y#	Y#
Hungary	Y	Y	Y#	Y	Y	Y	MV	MV	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	MV	N
Ireland																					
Italy				Y	Y	Y	Y	MV	N*	N*	N*	Y	Y	Y	Y	Y	Y	N*	MV	N*	Y
Latvia	N#	N#	N#	N	Y	Y	N	N	N	N	N	N	Y	Y#	N*	Y#	MV	MV	MV	N	MV
Lithuania	Y	Y	N*	Y	Y	Y	N	N	Y	N	Y	Y#	Y	Y#	N	Y	Y	Y#	Y	Y#	Y
Luxembourg	N#	Y	N#	Y	Y	Y	Y	N	Y	N	N	Y	Y	N	Y	Y	Y	N	Y	N#	N*
Malta	N#	N#	N#	N	N*	Y	N	Y	N	N*	Y	N	Y	N*	N*	N	N*	N*	N*	N*	N*
Netherlands	Y**	Y**	N	MV	Y	Y	Y	Y	N	N	N	Y	NA	Y	Y	Y	Y	Y	N	MV	N
Poland	Y#	Y#	N#	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y#	Y	Y	Y	Y	Y	Y
Portugal	Y	Y	N#	N	Y	Y	Y	Y#	Y	Y	N*	Y	Y	Y	Y	Y	Y	N	N	Y	N
Romania																					
Slovakia	N#	N#	N#	Y	Y	Y#	Y	N	Y	N	Y	N	Y	N	N	N	Y	N*	MV	Y	Y
Slovenia	Y	N#	N#	N	Y	Y#	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Spain	N	Y**	Y#	Y	Y	Y	N*	N*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N
Sweden	Y	Y	N	Y	MV	Y	Y	Y	Y	N*	Y	Y	Y	Y	Y	Y	Y	N	MV	Y	N
UK	Y	Y#	Y#	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Y (subtot.)	11	17	6	15	20	21	18	9	18	11	15	19	21	18	18	20	20	12	13	14	10
N (subtot.)	9	3	13	6			2	9	2	6	4	3		3	2	2		6	2	2	8
N*	2	1	2		1	1	1	1	1	3	2		1	1	2		1	3	1	4	3
MV (subtot.)		1	1	1	1		1	3	1	2	1						1	1	6	2	1
Total	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22	22

Code: Y (Yes), N (No), N\* (Unknown/ not applicable), MV: Missing Value

\*\*Data from other item in EC questionnaire, or from other source

Source (unless otherwise indicated): Survey DG SANCO 2007

#See footnotes on next to last page of Annex 5.

Annex 5 cont'd: Cancer Screening in the European Union - Qualitative Description													
Council Recommendations	4. Training	5. Compliance		6. Introduction of novel screening tests taking into account international research results.									
	4	5a	5b	6a	6b1	6b2	6b3	6b4	6b5	6b6	6c	6d	6e
EC Questionnaire	29	30	31	32	33	33a	33b	33c	33d	33e	34	35	36
	To ensure delivery of high quality screening	Based on fully informed consent	Accounting for special socio-	After evaluation in RCTs	Any of specified topics	Treatment procedures	Clinical outcomes	Side-effects	Morbidity	Quality of life	Assessed by pooling representative trials	Consider based on RTC, cost-effect., etc.	In routine health care, possibly using valida-
Austria	Y	Y	Y	N	MV	MV	MV	MV	MV	MV	MV	Y	Y
Belgium	Y	Y	Y#	Y/N*	N	N	MV	MV	MV	MV	Y	Y	N
Bulgaria													
Cyprus	Y	Y	Y	N	N	MV	MV	MV	MV	MV	N	N	N
Czech Rep	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	N	Y	Y
Denmark													
Estonia	Y	Y	Y	Y	N*	MV	MV	MV	MV	MV	N*	N*	N*
Finland													
France	Y	Y	Y	Y	Y	Y	Y	Y	Y	MV	N*	Y	N*
Germany	Y	Y	Y	Y	Y#	Y	Y	Y	Y	Y	Y	Y	Y
Greece	Y#	Y#	Y#	Y#	Y	Y	Y	Y	Y	Y	Y	Y#	Y#
Hungary	Y	Y	Y	Y	N	N*	N*	N*	N*	N*	N*	N*	Y
Ireland													
Italy	Y	Y	Y	Y	Y	Y	Y	Y	MV	MV	MV	Y	MV#
Latvia	Y	MV	Y	Y	MV	MV	MV	MV	MV	MV	MV	N	N
Lithuania	Y	Y	N*	N*	N*	MV	MV	MV	MV	MV	N*	MV#	MV#
Luxembourg	Y	Y	Y	Y	N	MV	MV	MV	MV	MV	N	N	N
Malta	N*	N*	N*	N*	Y	Y	Y	Y	Y	Y	N*	N	N#
Netherlands	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Poland	Y	Y	Y	N*	Y	Y	Y	MV	Y	MV	N	N	N
Portugal	N	Y	Y	N*	N*	MV	MV	MV	MV	MV	N*	Y	Y
Romania													
Slovakia	Y	Y	Y	Y	Y	MV	MV	MV	MV	MV	Y	N*	N*
Slovenia	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	Y
Spain	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Sweden	Y	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
UK	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y
Y (subtot.)	20	20	18	17	14	12	11	10	10	9	9	12	12
N (subtot.)	1		2	2	4		1	1	1		4	6	6
N*	1	1	2	3	2	1	1	1	1	1	6	4	3
MV (subtot.)		1			2	9	9	10	10	12	3		1
Total	22	22	22	22	22	22	22	22	22	22	22	22	22

Code: Y (Yes), N (No), N\* (Unknown/ not applicable), MV: Missing Value

Source (unless otherwise indicated): Survey DG SANCO 2007

\*\*Data from other item in EC questionnaire, or from other source

#See footnotes on next to last page of Annex 5.

## Annex 5 cnt'd: Cancer Screening in the European Union - Qualitative Description

Country	Column	# Footnotes by country:
Austria	1a2 1a3 1a3	Changed to yes (plausibility check) due to pilot projects Changed to no (plausibility check) because no invitation data available, invitations planned Non-population-based programme including colonoscopy
Belgium	1a3 1a3 1c-1g 3a1-3b 5b-6a	Changed to no (plausibility check) because no invitation data available Non-population-based programme Only implemented in some regions Only implemented in some regions Only implemented in some regions
Cyprus	2a, 3c	Health monitoring unit of MOH will monitor the programme when the current upgrading of the computerized documentation system is completed. Population registry provides invitation data.
Czech Republic	1a3	Changed to no (plausibility check) non-pop.-based colonoscopy screening, individual data collected since 2006, no men personally invited
France	1a1	Pop.-based programmes only in some regions
Germany	1a1, 1a3  1g, 2b 2c 2d-3a2 3c 3c 6b1	Changed to no .Non-population-based cervical and CRC screening programmes (call and recall only for Mx screening)  Call and recall only for breast cancer screening. For Mx and CRC screening. In 2008 evaluation and feedback for cervical screening will be provided Currently for breast and colorectal cancer, for cervical cancer planned in 2008 Cancer registries participate in regular ongoing evaluation of Mammography screening In individual studies for other screening activities, colonoscopy and skin cancer. Exceptions allowed
Greece	1a1, 1a3 16, 33, 34	Pop.-based pilot programmes were running in 1990s and early in millenium. Current status unknown Only items unequivocally confirmed, all other confirmations refer to expected cancer control programme
Hungary	1a3	Model programme
Ireland	1a1 1a1 1a2	Regional until introduction of national programme in 2008 Non-population-based screening in areas in which pop.-based programme is not yet implemented Not yet implemented nationwide
Latvia	1a1-3 2a,2c 6d 6e	Non-population-based programmes Partly Considering enhancing screening due to limited financial resources Not included (limited financial resources)
Lithuania	1g 2a,3a1,3b	Partly Partly
Luxemburg	1a1, 1a3 1a1, 1a3 1a3 3b	Changed to no (plausibility check) because no personal invitations issued Non-population-based programmes Biennial FOBT offered to patients in individual cancer control programme who refuse colonoscopy Under discussion
Malta	1a1 1a2 1a3 6e	Non-programme Pap screening is free of charge in public sector, self referral or by doctor Pop.-based programme to start 2008. High risk, non-prog., free public screening (HRT, fam. risk) High risk, non-prog. free screening in public sector (FAP, 1st deg. Relative with FAP) Malta is still in proces on gaining further experience on conventional methods
Poland	1a1, 1a2 1a3  2b	First invitations sent 2007 No FOBT screening, but pop.-based colonoscopy screening is provided for average risk population, and non-population-based screening offered to medium and high-risk groups >1/2 of breast and 1/3 of cervical target pop.invited: CRC part of target pop. tested.
Portugal	1a3 1e-q2	Implemenation in phases from 2007-2013 Check if started and if pop.-based Regional resources limited due to regional financing but adequte technical and scientific quality
Slovak Repub	1a1, 1a2, 1a3 1d	Changed to no .Non-pop-based national screening programmes without personal invitation For cervical cancer screening
Slovenia	1a2 1a3	Start of pop.-based national programme in 2008. Start of pop.-based national programme in January 2008.
Spain	1a3	Loco-regional pilot programmes
Slovenia	1a2 1a3	Start of pop.-based national programme in 2008 (ECN). Start of pop.-based national programme 2008 (ECN).
Spain	1a3	Loco-regional pilot programmes
UK	1a2 1a3	Breast cancer screening: Note different age group; 50-70 invited 3 yearly, 70+ on request. Note different age group; roll out for age group 50-69 from 6/2006 to 12/2009 in England



## Annex 5 cont'd: Cancer Screening in the European Union - Qualitative Description

Items in qualitative part of DG SANCO survey questionnaire 2007

14a	PAP: PAP smear begin at 20-30 yrs
14b	Mx: MX 50-69 yrs
14c	FOBT: FOBT 50-74 yrs
15	Followed: Breast screen Pgm: Breast screening programme implemented according to - 4th ed of EU breast guidelines?
16	People fully informed about related benefits and risks?
17	Screen-positives: Adequate complementary procedures, treatment, psychological support and after-care following evidence-based guidelines provided for patients with a positive screening test?
18a	Provided: Are human and financial resources made available in order to assure appropriate organisation and quality control
18b	Adequate: Are these resources satisfactory
19a	Disease burden & health resources: Disease burden and the healthcare resources available
19b	Side effects/ cost- effectiveness: Side effects and cost effects of cancer screening
19c	Scientific trials/ pilots: Experience from scientific trials and pilot projects
20	Diagnosis, treatment. Aftercare: Has a systematic call/recall system and QA been set up at all appropriate levels, together with an effective and appropriate diagnostic and treatment and after-care service following evidence-based guidelines?
	Is due regard paid to European data protection legislation, particularly as it applies to personal health data, prior to implementing cancer screening programmes?
22	For running programmes: Are centralised data systems made available to run the organised screening programmes?
23	To invite all targeted persons: Are all persons targeted by the screening programme invited, by means of a call/recall system, to take part in the programme?
24	On test, assessm, diagn. Are data on all screening tests, assessment and final diagnoses collected, managed and evaluated?
25	With data protection legislation: Are data collected, managed and evaluated in full accordance with relevant European legislation on personal data protection?
26a	By independent peer review: Is the process and outcome of organised screening regularly monitored by an independent peer review?
26b	With quick reports to public and staff: Are these results reported quickly to the public and the personnel providing the screening?
27	On data protection fully followed: Does your country adhere to the standards defined by the European Network of Cancer Registries in establishing and maintaining the screening databases in full accordance with relevant European legislation on personal data protection
28	At adequate intervals: Are screening programmes monitored by national cancer registries at adequate interval?
29	To ensure delivery of high quality screening: Is personnel adequately trained at all levels to ensure that they are able to deliver high quality screening?
30	Based on fully informed consent
	When organised screening is offered is a high level of compliance treated as a priority, based on fully informed consent?
33	Any of specified topics
	Does your country run trials, in addition to those on screening-specific parameters and mortality, on subsequent treatment procedures, clinical outcome, side effects, morbidity and quality of life?
33a	Treatment procedures: Subsequent treatment procedures
33b	Clinical outcomes
33c	Side-effects
33d	Morbidity
33e	Quality of life: Morbidity
34	Assessed by pooling representative trials: Is the level of evidence concerning the effects of new methods assessed by pooling of trial results from representative settings?
35	Consider based on RTC, cost-effect., etc.: Does your country consider to introduce or has it introduced potentially promising new screening tests, which are currently being evaluated in randomised controlled trials into routine healthcare, once the evidence is conclusive and after having taken into account other relevant aspects, such as cost-effectiveness in the different healthcare systems
36	In routine health care, possibly using validated surrogate endpoints: Does your country consider to introduce potentially promising new modifications of established screening tests, once the effectiveness of the modification has been successfully evaluated, into routine healthcare, possibly using other epidemiologically validated surrogate endpoints?



## **ANNEX 6**

### **EXAMPLES OF EFFECTIVE IMPLEMENTATION OF SCREENING PROGRAMMES IN THE EU**

## **Annex 6: Examples of effective implementation of screening programmes in the EU**

There are several examples of effective implementation of population-based cancer screening programmes in the European Union. Due to the available space they cannot all be mentioned here. A number of examples are provided below and in [18]. They include substantial decreases in cervical cancer mortality subsequent to introduction of population-based screening in Finland and the United Kingdom, and less substantial, but pronounced reductions in breast cancer mortality after introduction of population-based screening in Sweden, Denmark, or the Netherlands. Scientific investigation and piloting prior to nationwide rollout can provide information essential to effective programme implementation [32, 41, 44].

### **1 Breast cancer screening**

The IARC and numerous other institutions and organizations have concluded that trials have provided sufficient evidence for the efficacy of mammographic screening of women between 50 and 69 years old. Women who were invited to be screened showed a reduction in breast cancer mortality averaging 25%, with the degree of benefit depending on the particular trial. Since not all women accepted the invitation, the reduction among those who chose to participate in screening programmes is somewhat higher, being estimated, based on the trials, at 35% [19].

#### **1.1 Sweden**

Due to the increasing survival of breast cancer patients, rather long periods of time are required to assess the full impact of service screening programmes for breast cancer. Sweden is particularly suited for evaluation of population-based screening because national recommendations for implementation of breast screening programmes were issued in the mid 1980s and programmes in some regions of the country have been running since that time. Mammography screening is currently recommended for women age 40-74 years.

Recently, population-based mammography screening programmes have been evaluated in Sweden by combining individual breast cancer patient data with screening invitation data to fully document the impact upon the individual woman of actually receiving the screening mammography examination [42]. This effect was not studied by the randomised controlled trials. In a study covering women aged 40-69 in nearly half of the country, it was found that a mortality reduction to the population of 27% (screened and non-screened women combined) corresponded to a mortality reduction of 40-45% in the women actually screened. Overall, fewer than 472 women (95% CI: 418-554) needed to be screened by mammography to save one life from breast cancer. The number needed to screen to save one life ranged from 188 to 862 in the various regions covered by the study. As to be expected, the longer the duration of follow-up, the lower was the number of women who needed to be screened to save one life. The impact of population-based service screening was significant after adjustment for self-selection bias. Furthermore, trends in incidence and mortality suggest that most of the mortality reduction in women attending screening was due to the effect of screening [43]. Given the long follow-up period required to fully assess the impact of service screening for breast cancer, the evidence gathered to date is likely to underestimate the full impact.

#### **1.1 Denmark**

In Denmark, the effect on breast cancer mortality has also been investigated during the first 10 years after introduction of mammography service screening in Copenhagen. Breast cancer mortality in the women invited to screening was reduced significantly by 25%. This corresponded to a mortality reduction of 37% in women actually attending screening [27].

### 1.3 Finland

In a recent study, the effect of service screening has been compared in three cities (Helsinki, Tampere and Turku) which all employed different screening policies. In the city without invitation of eligible women to screening (Helsinki), a small, non-significant increase in breast cancer mortality was observed (11%). In the city in which only part of the eligible women were invited (Tampere) the reduction in breast cancer mortality was non-significant (14%). In the city (Turku) in which all eligible women were invited to screening in the 10-year study period (1987-97) a significant 36% reduction in breast cancer mortality was observed[31].

### 1.4 Italy

The impact of population-based breast cancer screening programmes has also been investigated in Italy. A cohort evaluation of the breast screening programme in Florence showed a 25% reduction in mortality with invitation to screening [28, 29]. Furthermore, earlier detection of breast cancer led to a significant reduction in mastectomies [30, 46]. A large multi-centre case-control study has been performed within the project "Impatto", the results of which are expected in the near future.

### 1.5 The Netherlands

In the Netherlands the impact of breast cancer screening has been evaluated at the national level from the start of the national population-based programme. In 2006, breast cancer mortality in the age group 55-74 years was 26% lower than in 1986-1988 before the start of the national breast screening programme in 1989 [25]. A substantially higher impact in the group of women actually attending screening may also be expected.

## 2 Cervical Cancer Screening

Cytological screening at the population level every three to five years can reduce cervical cancer incidence up to 80% [20]. This decrease results from early detection of cervical cancer precursor lesions, that is, lesions which, if appropriately treated, will not progress to invasive cancer. If implemented effectively, screening can reduce cervical cancer mortality to a similar degree.

### 2.1 Finland

In Finland (population 5 million) organised cervical screening was introduced in the early 1960s; piloting first within the area of three municipalities in 1963 and extending within a few years to most parts of the country. By 1970, the coverage of the population-based programme was already above 80% of women in the target age group. Furthermore, from the early 1970s onwards, the registered coverage has become almost complete in these target age groups. By the early 1990s the age-standardised incidence of cervical cancer had decreased by 70-80%. Subsequently, the reduction in cervical cancer mortality was even more pronounced. Coverage of the target population is approximately 90% and participation is over 70% [2]. These developments have enabled Finland to reach the lowest level of cervical cancer incidence and mortality currently reported in the EU (4.9 cases/100,000 women and 1.6 deaths/100,000 women).<sup>35</sup> Particularly noteworthy is the comparatively low number of screening examinations in a woman's lifetime which is required to achieve such benefits. Due to the five-year screening interval and the 30-60-year age range of the target population, women with normal results are only invited to a total of 7 examinations. Avoiding unnecessary screening examinations improves the balance between harm and benefit of screening and has a substantial impact on cost-effectiveness.

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<sup>35</sup> Incidence and mortality rates are age adjusted (European standard population).

## 2.2 The Netherlands

The Netherlands is another Member State in which rates of cervical cancer have reached very low levels after nationwide implementation of a population-based cervical screening programme. At the same time, unnecessary use of resources for screening has been avoided. This is reflected in the same low minimum number of screening examinations to which women are invited in a lifetime as in Finland (7 invitations to 30-60-year-old women, once every five years). The programme was reorganised in the mid 1990s [36] and cervical cancer rates have in the meantime reached the third lowest level of incidence (8.0 cases/100,000) and the fifth lowest level of mortality (3.0 deaths/100,000) in the EU 27. Currently cervical cancer mortality in the Netherlands is more than five-fold lower than in the Member State with the highest rate (Table 1).

## 2.3 Italy

Before the 1990s most cervical cancer screening in Italy was performed outside of population-based programmes [40]). A population-based programme started in Turin in 1992 in a population in which some spontaneous screening was already present. Between 1992 and 1998, a 20% incidence reduction was observed among invited *vs* uninvited women and a more than 70% reduction of cervical cancer incidence was associated with attendance to the programme [39]).

Nationwide implementation of population-based cervical cancer screening programmes on a regional basis has been recommended in Italy since 1996. Recommendations are largely based on European Guidelines and include personal invitation of women aged 25-64 years to Pap tests every three years, a monitoring system, and quality assurance procedures for each programme phase (for references see: [38]). Within less than ten years, active programmes in Italy had a target population accounting for nearly two-thirds of the nationwide population 25-64 years of age. This process and continuous improvement in effectiveness is expedited by the National Centre for Screening Monitoring, which issues annual reports on programme implementation, activity levels and process indicators, to which all loco-regional programmes contribute. The positive impact of screening is also reflected in the current 7<sup>th</sup> and 2<sup>nd</sup> lowest national rates of cervical cancer incidence (9.5 cases/100,000) and mortality (2.6 deaths/100,000), respectively, compared to other EU Member States (Table 1).

## 2.4 United Kingdom

The introduction of the UK cervical screening programme is another example of the profound effect that a population-based screening programme can have on the burden of the disease in the population. In the two decades prior to introduction of the programme (1967-1987) cervical cancer mortality rose three-fold in England and Wales in women younger than 35 years. By 1988, when the call-recall system was started, incidence in this age-range was among the highest in the world despite substantial opportunistic screening. These dramatic trends were reversed by introduction of the population-based programme. During the decade after the start of the programme, screening coverage in England doubled and invasive cervical cancer mortality rates decreased by approximately 50%. It has been estimated that in the absence of the national population-based programme approximately 5,000 additional deaths per year due to cervical cancer would now be occurring [34].

## 3 Colorectal cancer screening

Population-based colorectal cancer screening is a comparatively new tool of cancer control. Current evidence of the efficacy and effectiveness of screening is based on trials (for references see [35, 18]) because service screening programmes are lacking or are in the early implementation phase. The paucity of experience with effective screening programmes for colorectal cancer underlines the need for conducting pilot programmes and studies prior to rollout across a country or region. In the pilot phase, protocols and procedures can be developed, tested and, if necessary, improved before

widespread implementation. The experience and results of piloting enable responsible authorities to make better informed decisions about programme implementation and planning, and provide data relevant to cost-effectiveness analysis. The lessons learned may also save substantial time and effort in the programme rollout phase by raising the knowledge base in all regions of the country.

### **3.1 Piloting colorectal cancer screening in the United Kingdom**

Beginning in March 2000, nearly half a million residents in two pilot areas in England and three pilot areas in Scotland were invited to take part in a demonstration pilot screening programme to test the feasibility of a national screening programme for colorectal cancer based on the faecal occult blood test (FOBT). The results of the first round of the pilot were published in July 2004. They showed that the short-term outcomes believed necessary to bring about a reduction in mortality from colorectal cancer can be achieved by the UK's NHS outside the context of a randomised trial.

However, the pilot experience and results pointed to a number of aspects which required special consideration in the planning and implementation of the national programme: for example, the higher than expected acceptance of screening by elderly men and women; the sensitivity and specificity of the faecal occult blood test and the distribution of screen-detected lesions under routine screening conditions in the target population; the higher positivity rate of the FOBT and the higher rate of detected cancers in Scotland than in England; and the need for accelerated training programmes in colonoscopy for assessment of screen positives. Knowing these issues in advance facilitated the planning and implementation of the national programme and also underlined that introduction of screening must go hand-in-hand with improvements in provision of services [44].

Rollout of colorectal cancer screening began in England in 2006 (2-yearly FOBT, age 60-69) and in Scotland in 2007 (2-yearly FOBT, age 50-74). Rollout will begin in Wales in 2008 (2-yearly FOBT, age 50-74) and, pending a final decision by the responsible authorities, will also begin in 2008 in Northern Ireland. In England, residents 70+ years may request FOBT screening when the programme reaches their region; phasing in of invitation to age 75 will begin in 2010.

### **3.2 Rollout of population-based colorectal cancer screening in Finland**

Rollout of the national colorectal cancer screening programme in Finland began in 2004. The programme is expanding gradually and by randomization. It is too early to measure the effect of screening in the target population, but the programme design permits evaluation. In 2007 about one-third of the Finnish population was covered. During 2004-2006, nearly 71% of persons invited to attend screening complied. Overall, women took part more readily than men, with the best participation rate, of 78%, among women, while that of men was 63%. Among the screened, 2.1% were found with blood in stools, 3% of men and 1.5% of women. Cancers and adenomas were detected according to expectations, in 8.6% and 43.2%, respectively, among those who underwent colonoscopy [24].





## **ANNEX 7**

### **WEBSITES OF SCREENING PROGRAMMES IN EUROPE COLLECTED IN THE EUNICE PROJECT**



**Annex 7: Websites of Screening Programmes in Europe collected in the EUNICE projec**

<b>COUNTRY</b>	<b>WEB SITES</b>
<b>BELGIUM</b>	<a href="http://www.nic-ima.be/nl/projects/mammo/context_goal/">www.nic-ima.be/nl/projects/mammo/context_goal/</a>
<b>CZECH REPUBLIC</b>	<a href="http://www.mamo.cz">www.mamo.cz</a>
<b>FRANCE</b> Ademas Isere France general	<a href="http://www.ademas-alsace.com">www.ademas-alsace.com</a> <a href="http://www.odlc.org/">www.odlc.org/</a> <a href="http://www.rendezvoussantepius.net/">www.rendezvoussantepius.net/</a>
<b>GERMANY</b>	<a href="http://www.kooperationsgemeinschaft-mammographie.de/home/home.php">www.kooperationsgemeinschaft-mammographie.de/home/home.php</a>
<b>ICELAND</b>	<a href="http://www.krabb.is">www.krabb.is</a>
<b>IRELAND</b>	<a href="http://www.nbsp.ie">www.nbsp.ie</a>
<b>ITALY</b>	<a href="http://www.gisma.it">www.gisma.it</a> <a href="http://www.osservatorionazionalecreening.it">www.osservatorionazionalecreening.it</a>
<b>LUXEMBOURG</b>	<a href="http://www.mammographie.public.lu/">www.mammographie.public.lu/</a>
<b>NORWAY</b>	<a href="http://www.kreftregisteret.no">www.kreftregisteret.no</a>
<b>PORTUGAL</b>	<a href="http://www.ligacontracancro.pt/">www.ligacontracancro.pt/</a>
<b>SPAIN</b>	<a href="http://www.programascancerdemama.org/">www.programascancerdemama.org/</a> <a href="http://www.sp.san.gva.es/DgspWeb/ppcm/">www.sp.san.gva.es/DgspWeb/ppcm/</a>
<b>THE NETHERLANDS</b>	<a href="http://www.bevolkingsonderzoekborstkanker.nl/">www.bevolkingsonderzoekborstkanker.nl/</a>
<b>UNITED KINGDOM</b>	<a href="http://www.cancerscreening.nhs.uk">www.cancerscreening.nhs.uk</a>
<b>SWITZERLAND</b> Fribourg CH Genève CH	<a href="http://www.liguecancer-fr.ch/fr/">www.liguecancer-fr.ch/fr/</a> <a href="http://www.fgdcs.ch/accueil/index.php">www.fgdcs.ch/accueil/index.php</a>



# **ANNEX 8**

## **LIST OF ABBREVIATIONS**

## **Annex 8: List of Abbreviations**

<b>CRC Cancer</b>	Colorectal Cancer
<b>CS</b>	Colonoscopy
<b>DG SANCO</b>	Directorate-General for Health and Consumers of the European Commission
<b>E-ASR</b>	European age-standardized rates
<b>ECN</b>	European Cancer Network
<b>ENCR</b>	European Network of Cancer Registries
<b>EU</b>	European Union
<b>EUNICE</b>	European Network for Information on Cancer
<b>EUROSTAT</b>	Statistical office of the European Communities
<b>FOBT</b>	Faecal Occult Blood Test
<b>FS</b>	Flexible Sigmoidoscopy
<b>IARC</b>	International Agency for Research on Cancer
<b>IBSN</b>	International Breast Screening Network
<b>LT</b>	Lifetime
<b>natw</b>	Nationwide
<b>non-pop-b</b>	Non-population-based
<b>no prog</b>	No programme
<b>pilot</b>	Piloting
<b>plan</b>	Planning
<b>pop-b</b>	Population-based
<b>QT</b>	Audit system on Quality of breast cancer diagnosis and Treatment
<b>reg</b>	Regional
<b>RCT</b>	Randomized Controlled Trial
<b>rollout cmp</b>	Rollout complete
<b>rollout ong</b>	Rollout ongoing
<b>SEED</b>	European Screening Evaluation Database
<b>yr</b>	Year

European Commission

**Cancer screening in the European Union. Report on the Implementation of the Council Recommendation on cancer screening – First Report**

von Karsa L, Anttila A, Ronco G, Ponti A, Malila N, Arbyn M, Segnan N, Castillo-Beltran M, Boniol M, Ferlay J, Hery C, Sauvaget C, Voti L, Autier P (authors)

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