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Comparisons of cervical cancer screening programmes in the European Union

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Abstract

This paper summarises the similarities and differences between the cervical cancer screening programmes operating in the 15 Member States of the European Union as presented in the separate papers prepared by each country. The screening programmes are compared in terms of their duration of operation, type and sources of funding, invitation methodology, target population, organisation and quality assurance methodology with the aim of shedding some light upon the current situation of cervical cancer screening within the European Union. © 2000 Elsevier Science Ltd. All rights reserved.

Keywords: Cervical cancer; Screening methodology; Organised programmes; European Union

Following the separate presentations of the cervical cancer screening programmes operating in the 15 countries of the European Union (EU), the similarities and differences between these programmes in terms of duration, type of funding, population targeted, organisation and quality assurance are presented.

The Papanicolaou (Pap) smear test is used by all the programmes as the screening method of choice which in most cases is combined with gynaecological examination. In Italy, the screening test is combined with colposcopy.

Despite all the discrepancies in the various aspects of the European cervical cancer screening programmes, it is more than obvious that all Member States have undertaken a substantial degree of activity towards the early detection of cervical cancer. Table 1 summarises the type and duration of the screening programmes within the EU. Great variability is evident in relation to the type of the screening programme (regional/national) and its duration. National cervical cancer screening programmes are currently operating in six European Member States: Finland, England, Germany, Luxembourg, The Netherlands and Sweden. National programmes were first set up in the 1960s in Finland, Luxembourg and Sweden and the most recent one is currently under way in Ireland. In Austria, Belgium, France, Greece, Italy, Portugal and Spain cervical cancer screening is performed via regionally organised programmes, that for some Member States cover only parts of the national population. In Denmark, cervical cancer screening is organised at the level of local authorities in the whole country (15 counties).

Most programmes receive at least partial governmental financial support (National Health System, National Health Insurance), whereas the contribution of the European Commission (received by most — but not all — programmes) is directed towards quality assurance. In England, an incremental paying system is in force, where the general practitioners (GPs) are paid by the National Health System on the basis of the participation rate.

In most countries, opportunistic cervical cancer screening existed before the initiation of organised screening activities. Opportunistic screening runs alongside the organised activities in all Member States of the EU and in most cases the proportion of opportunistic cervical cancer screening is not known. There is great diversity in the sources from which the target population for the screening programme is identified and in the level of their accuracy. In some countries population registries are used (Belgium, Denmark, Finland, The Netherlands, Sweden), in others health insurance or National Health System lists (England, France,

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Table 1
Duration and type of funding of cervical cancer screening programmes in the European Union (EU)

Country[a] (screening programme)	Type of screening programme (national/regional)	Year of initiation	Source of funding (EU, government, private, other)
Austria	Regional	1970	National Health Insurance
Belgium	Regional (Flemish region)	1994	1. Flemish community, EU (organisation of the screening) 2. National Health Insurance Institute (all medical activities)
Denmark	Regionally organised in each of the 15 counties	3 counties 1967–1968 7 counties in the last 10 years	National Health Insurance Scheme
England	Nationally organised, locally co-ordinated (8 health regions)	1988	National Health Service (central government)
Finland	National	Pilot 1963 gradually covering most of the country	Municipalities, Finnish Cancer Organisation
France	4 permanent organised programmes in 4 different areas (départements)	1990	National Health Insurance Systems (no specific budget for screening)
Germany	National	1971 (West, extended to the East in 1991)	Statutory Health Insurance
Greece	2 regional programmes (one in Ormylia Halkidiki and another in Messinia and Ilia)	1991 (both programmes)	EU, Secreteriat of Youth, local initiatives (Ormylia) EU, Anticancer fund raise (Ministry of Health), Hellenic Anticancer Institute, other private sponsors (Messinia and Ilia)
Ireland	Pilot (before expanding to national)	Scheduled for the year 2000	Government (Department of Health)
Italy	National, regional organisation, local management 73 local programmes active	1980 (Florence) 1992 (Turin) Most others from 1995	National Health Service, EU
Luxembourg	National	1962	National Health Fund
The Netherlands	National	1996	Dutch Health Insurance Council
Portugal	Regional (86 counties of the Central region)	1990	National Oncological Plan (National Health System)
Spain	Regional (Castilla y León)	1986	Central Budget of Castilla y León, EU
Sweden	National (regionally organised)	Mid-1960s	Swedish National Board of Health and Welfare (in 5/26 counties) or €5.95 to €14.88 payable by the woman

[a] By alphabetical order.

Germany), population registries or local health administrations (Italy), census data (Greece, Spain) or combinations of more than one source.

The majority of countries invite women to the screening programme sending a personal invitation (in some cases also stating the place and the time of the examination), some others leave the invitation responsibility to the GPs or gynaecologists (Luxembourg, Portugal), or personally invite the women to make an appointment with their GP (Denmark, The Netherlands), or leave the women themselves free choice when to arrange an examination (Germany). In The Netherlands, each of the regional screening organisations organise their own invitation system, as long as it is certain that women in the target group (as defined by population registry) receive an invitation. This system results in variability within the country, in that some regional organisations may involve GPs in the invitation system and others do not.

The age group targeted ranges from 20 to 25 years up to 59 to 64 years in most countries (Table 2). The European Guidelines suggest that cervical cancer screening should target women aged 25–64 years of age, but in some instances minor deviations from this guideline are accepted because of the presence of certain risk factors (e.g. social, cultural). However, the cost-effectiveness of these deviations has generally not been proven. Finland and The Netherlands address a smaller target age group for organised cervical cancer screening (30–60 years) compared with the others. In Austria, women aged 20 years

Table 2
Invitation to cervical cancer screening and population covered within the European Union (EU)

Country[a] (screening programme)	Mode of invitation	Target population	Age group (years)	Proportion covered by (type of screening)	
				Organised	Opportunistic
Austria	Personal invitation	120 000	⩾20	85%	60%
Belgium	Personal invitation	Almost 1.6 million (Flemish region)	25–64	82.3% both organised and opportunistic	Not known
Denmark	Personal invitation	1.3 million	23–59	90%	Not known
England	Personal invitation	Almost 14 million	20–64	84%	4%
Finland	Personal invitation	256 616	30–60	89.5%	Not known (93% for all smears)
France	Personal invitation	477 301 (17 million nationally)	25–65 (not in all projects)	22–69%	Not known
Germany	Up to the woman and reminders by office staff or physicians during routine medical visits	25 million (West) 5.5 million (East)	⩾20	46–50%	Not known
Greece	Personal invitation (both programmes)	Just under 17 000 (Ormylia)	25–64 (both programmes)	87.8% (Ormylia)	Not known
Ireland	Invitation and self-registration	67 000 (pilot) 1 million (eligible nationally)	25–60	Not available	Not known
Italy	Personal invitation	230 000 (Florence) 280 000 (Turin) 5.3 million (active organised programmes)	25–64	74% (Turin including opportunistic) approximately 70% most active programmes (including opportunistic)	
Luxembourg	Via GPs or gynaecologists	180 982	>15	38.92%	
The Netherlands	Personal invitation to contact GP	3.6 million	30–60	80% (including opportunistic)	
Portugal	Invitation via GPs	292 000	20–64	51%	Not available
Spain	Personal invitation	627 788	25–65	41.47%	Not known
Sweden	Personal invitation		20–59	50–70% (most counties)	

GP, general practitioners.
[a] By alphabetical order.

and above are invited to the screening programme and in Luxembourg a much younger lower age limit applies (>15 years). None of these two countries specify an upper age limit for participation in the screening programme.

The size of the target population for organised cervical cancer screening in each country varies, so does the proportion covered by the organised activities. In Table 2 the proportion covered by organised cervical cancer screening activities (as reported by each country) is presented. In The Netherlands, this proportion refers to both organised and opportunistic screening. With the exception of England (where the estimate of opportunistic screening was 4%) none of the other Member States give information on the levels of opportunistic screening. These parameters are largely dependent on the type (national/regional) and on the organisational aspects of each screening programme.

There is great variability between the Member States regarding the professional background of the smear taker (Table 3). Smears are taken only by general practitioners in Denmark and Portugal. General practitioners and/or other physicians (including gynaecologists) are responsible for smear taking in Belgium, France, Germany, Luxembourg and Spain. In some instances other health specialists such as midwives or trained nurses are used (Finland, Sweden). In England, Greece, Ireland, Italy and The Netherlands a combination of physicians and other health specialists are the professionals who perform the Pap test. In Austria, the smear taker is a gynaecologist or at least a fellow in gynaecology.

The recommended screening interval following a negative result is 3 years in most countries: Belgium, Denmark, France, Italy, Spain and Sweden (Table 3). Other countries perform a Pap test at longer time intervals (3–5 years): England, Finland, Ireland, The Netherlands. In Austria, Germany and Luxembourg a much shorter interval applies (1 year). Greece and Portugal apply a special rule in the screening interval: the first

Table 3
Organisation of cervical cancer screening within the European Union (EU)

Country[a] (screening programme)	Smear taker (who?)	Screening interval following negative result	Communication of results	
			Normal	Suspicious
Austria	Gynaecologists	1 year	Mail or phone to the smear taker	Mail or phone to the smear taker
Belgium	Gynaecologists/GPs	3 years	Report to the smear taker	Report to the smear taker
Denmark	GPs	3 years	Directly to the woman to contact GP	Report to GP
England	GPs or general practice nurses	3–5 years	Report to the smear taker	Report to the smear taker
Finland	Trained nurses (midwives)	5 years	Letter directly to the woman	By phone if possible, always by mail
France	Gynaecologists/GPs	3 years (following 2 negative smears)	Not specified	Not specified
Germany	Office-based gynaecologists and GPs	1 year	By the smear taker	Mail or phone by the smear taker
Greece	Gynaecologists (Ormylia) Gynaecologists, trained rural doctors and midwives (Messinia and Ilia)	1 year following the first smear, then every 3 years (Ormylia) 2 years (Messinia and Ilia)	Letter directly to the woman (both programmes)	Phone and personal meeting with screening physician (Ormylia) Phone or house call (Messinia and Ilia)
Ireland	GPs, family planning and community clinics, hospitals	5 years (pilot)	Letter directly to the woman	Advised to contact smear taker
Italy	Midwives (mainly) and gynaecologists	3 years	Varies. Most frequently letter directly to the woman	Varies
Luxembourg	GPs and/or gynaecologists	1 year	Not specified	Not specified
The Netherlands	GPs and their practice assistants	5 years	Via the GP	Via the GP
Portugal	GPs	1 year following the first normal smear, then every 3 years	Letter via the GP	Letter via the GP
Spain	Family doctors	3 years	Letter via the primary care physician	By the primary care physician
Sweden	Trained midwives	3 years	Letter directly to the woman (6 counties do not inform women in cases where results are negative)	Via the local gynaecology clinic

GP, General practitioner.
[a] By alphabetical order.

repeat smear test is scheduled in 12 months and then following a negative result the screening interval is 2 or 3 years. Negative smear test results are communicated via personal letter to the woman or notification via the GP or gynaecologist, whereas suspicious results are more commonly communicated to the smear taker who has the responsibility of informing the woman and of ensuring follow-up.

In relation to quality assurance in cervical cancer screening, all screening programmes adhere to specific guidelines originating from various sources. Countries where national screening programmes operate follow national quality assurance guidelines: Denmark, England, Finland, France, Germany, Ireland, Italy, The Netherlands, Portugal, and Sweden. In Austria, national guidelines issued by the Austrian Society of Pathology, the Austrian Society of Cytology and the national health insurance are in force. In some cases, national guidelines are complemented by regional guidelines. In Luxembourg, special criteria set up in 1990 in anticipation of the National Health Fund regulate the operation of the cervical cancer screening programme. The issues presented in the European Guidelines for Quality Assurance in Cervical Cancer Screening are general in nature and do not cover special issues and/or conditions present in each Member State. Therefore, the European Guidelines are taken into account by most countries, but they are implemented in

parallel with the existing national/regional guidelines for, e.g. Belgium. In Greece, as neither national nor regional guidelines exist, the organised screening programmes of the country adhere to the European Guidelines only.

Conclusions

Overall, this publication has helped bring to the light the current situation of cervical cancer screening in the Member States of the European Union. A substantial amount of screening activity is present is all countries, but there is great variability in the organisation of cervical cancer screening and on the proportions of population covered by each of these screening programmes. Few screening programmes were designed to collect data for statistical purposes and the type of data collected per screening programme has not been homogeneous. As a result of this non-systematic data collection, it is difficult to evaluate cervical cancer screening programmes at a central level. In terms of quality assurance, since the publication of the European Guidelines in 1993, all Member States are implementing protocols for quality assurance in cervical cancer screening. Currently, most programmes put serious effort into further improvement of all aspects of quality assurance and into the search for new methodologies, such as the clinical trials on the effectiveness of human papilloma virus (HPV) testing in Sweden.

In our view, further efforts are needed in order to expand all regional programmes into national ones in all Member States. The guidelines for implementing cervical cancer screening programmes should be harmonised in all countries, as well as the data collection and coding systems. Continuous training should also be given priority in each screening programme, which may also be complemented by a series of short courses/seminars where professionals from all European screening programmes will participate. These activities will largely facilitate the comparability of screening activities across countries and will help the assessment of cervical cancer screening effectiveness and cost-effectiveness of resource allocation at the European level.

Appendix 1. European guidelines for quality assurance in cervical cancer screening (short summary)

In 1993, a committee of cancer experts compiled a set of guidelines on the quality assurance in cervical cancer screening on behalf of the European Union (CECDG V E.1. 'Europe Against Cancer' programme). This committee consisted of the following experts: D. Coleman, N. Day, G. Douglas, E. Farmery, E. Lynge, J. Philip and N. Segnan. The full document was published in Ref. [1].

These guidelines are presented in 8 sections:

1. Introduction
2. Organisation of the screening programme
3. Screening methodologies
4. Management of the patient with an abnormal cervical smear
5. Monitoring the programme and use of resources
6. Training of participating personnel
7. Quality assurance in the cytology laboratory
8. Appendix A: Monitoring the programme, tabulation of parameters
   Appendix B: Terminology used for the cervical cytology reporting in the EU

The aim of this document was to improve the quality of cervical screening, to increase coverage, to optimise the use of resources and thereby to contribute to a reduction of cervical cancer incidence and mortality in the EU countries.

Section 1 gives brief background information about cervical cancer, presents examples on the effectiveness of organised screening programmes (from the Nordic countries where such programmes were first introduced), gives some data on cervical cancer incidence and mortality in the EU countries (using the most recent data available at the time the document was compiled) and describes the screening activities in the EU countries.

Section 2 describes the infrastructure of a successful cervical cancer screening programme. It gives a definition of the catchment area, of the target population, it specifies the screening interval and it proposes tools to reach the target population and to increase compliance.

Section 3 describes the methodology of cervical cancer screening, that is the equipment and the procedure required for taking a cervical smear. It also describes the smear sampling and fixing methodology, it defines the satisfactory smear and makes reference to the reporting and processing of cervical smears.

Section 4 refers to the management of women with an abnormal smear, although there is great variation in the approach to the treatment of these women within the EU and points out areas where future collaborative research is required.

Section 5 deals with the monitoring of the screening programme and the use of resources, giving the parameters required for monitoring the effectiveness of the screening programme and the use of resources in the short and long terms. It also describes the amount and type of data that need to be collected, including advice and a layout for tabulation of the data in the form of an Appendix.

Section 6 is dedicated to the training of the personnel of the screening programme and in particular the smear

takers, the clerical and secretarial staff, the cytotechnologists and the anatomopathologists.

The final section (Section 7) refers to the quality procedures for internal (e.g. specimen collection, preparation and staining, primary screening, selected rescreening, double screening, review of previous cytology) and external (e.g. slide exchange schemes, proficiency testing) quality assurance in the cytology laboratory, as well as to laboratory accreditation.

Owing to the diversity of healthcare systems across countries, it is extremely difficult to indicate a single approach as to how quality assurance should be organised at the national level. For this reason, this set of guidelines was kept as simple as possible in order to facilitate application by all Member States without affecting the special features of the screening programmes operating in each country, but also to facilitate monitoring and comparison of screening outcome between countries.

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References

1. Coleman D, Day N, Douglas G, *et al*. Guidelines for quality assurance in cervical cancer screening. *Eur J Cancer* 1993, **29A**(Suppl. 4), S1–S38.