

Detecting cervical cancer: the European experience

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An effective cervical smear test does not equate to an effective screening programme. A major challenge in Europe has been to formulate efficient, cost-effective, and balanced programmes, and to implement them. Improving participation and follow-up, and reducing the false-positive and false-negative rates are also important factors. This article discusses the process of implementing and maintaining effective screening programmes in European health care systems, comments on common pitfalls of such programmes, and suggests future directions.

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The questions at issue

Between 1980 and 1995, research findings established the value of Papanicolaou (Pap) screening in reducing the risk of invasive cancer and mortality rate of cervical cancer. We now know that regular testing reduces the risk of cancer by 80% to 98%.^{1,2} Part of the lesson that can be learned from the European experience is to recognise that if a society wants to use Pap testing, it should focus as much on creating a good test programme as on improving the test procedure.

Balancing the benefits, costs, and side effects of screening programmes requires that the following questions be answered^{3,4}:

- (1) Is testing cost-effective compared with other preventive activities?
- (2) How should we plan a screening programme to ensure efficiency, cost-effectiveness, and equity?
- (3) Should the test also be used for case-finding, or only for screening?
- (4) How can side effects such as false positive and false negative results be reduced?
- (5) Is public education good enough, so that the patient knows about the test, its advantages, and its disadvantages; the risk of cancer developing; the risk of receiving a false negative or a false positive result; or the psychological side effects associated with screening?

Health care planning

Although most European countries have only recently decided whether or not to implement screening programmes, the debate has been run by doctors and has been restricted to medical issues. Political and administrative bodies, however, are now cooperating with the medical profession—namely, to recommend testing, formulate specific guidelines, balance cost-effectiveness, and prioritise the competing preventive medicine programmes. The cooperation between clinicians and health care planners is also improving. Unfortunately, doctors in many countries are not concerned with health care planning and the organisation of a good cervical smear programme. Consequently, some programmes have high costs per detected case of cervical cancer and use health care resources poorly.^{5,6}

Improving cost-effectiveness

The most cost-effective way of raising the impact of cervical screening is to raise the participation rate.^{1,2,5-8} This requires public information; efforts to motivate individuals to participate; and computer systems to register, run, and supervise all elements of the programme, including calls, reminders, and test results. In addition, the programme should be supervised by a steering committee that is composed of general practitioners, gynaecologists, pathologists, and administrative staff who have computer skills.^{9,10}

A society gets most benefit in terms of an 'investment' if the participation rate is high. On the other hand, that society must accept an individual's right to decline a preventive offer, provided that sufficient information is given about the test and its

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advantages and disadvantages, so that individuals can make a personal choice. Clinical observations from the 1990s—especially from the United Kingdom—have shown that raising the participation rate of a screening programme reduces the incidence of cervical cancer.¹¹ Unfortunately, the age-group from 35 years to the current cessation age of 60 to 70 years has low test participation rates, even though this age-group has the highest risk for the development of cervical cancer.¹

Most European countries recommend starting systematic cervical screening from the age of 21 to 25 years and continuing until the age of 60 to 70 years at 3-year intervals. The Netherlands is considering increasing the recommended test interval from 3 to 5 years and to postpone the first test until a woman is 25 years, as an attempt to achieve better cost-effectiveness.⁵ Denmark recommends screening women aged 23 to 60 years at 3-year intervals, but the Danish Commission is currently considering making adjustments in the same direction as those of the Netherlands (Danish National Board of Health, written communication, 1999).

Besides being used to screen healthy women, cervical smear testing could be used as a case-finding method if patients present with symptoms such as spotting or abnormal vaginal discharge. Some guidelines have recommended that patients with such gynaecological complaints should instead receive a colposcopic examination.¹⁰ Other guidelines (eg in Denmark) suggest that it is acceptable to use the smear test, as long as the clinician bears in mind that false negative results may arise due to severe inflammation or bleeding, for example.

An important aspect of a good screening programme is ensuring good follow-up in cases where it is needed and recommended. All tests should ideally be registered in one database, which would ensure that regular call notices and reminders are issued, and that adequate follow-up visits are arranged. For example, if a woman for some reason is tested before the end of a 3-year interval and the smear shows normal cells, the computer would automatically postpone the next test reminder date for another 3 years. This computer supervision is now used in many European countries.^{1,9,10}

A common and inappropriate approach towards screening has been to focus on performing good tests for women who attend a doctor's clinic. This approach is inefficient and inequitable, not only in terms of

preventing cervical cancer in a whole population, but also in terms of gaining societal benefit. Implementing an efficient screening programme thus requires balancing the coverage of the population with detecting cervical cancer in individual women. Some cancers will inevitably occur, even if all women are tested.^{1,5-7,12,13}

False negative and false positive results

Because pre-stages of cancer usually arise more than 10 years before the onset of invasive disease, testing a woman three times at 3-year intervals will have a much lower cumulative risk of a false negative result occurring than a single test will have. In contrast, the risk of obtaining a false positive result accumulates over an individual's lifetime. Unfortunately, many young women are tested too frequently, thus increasing the risk of obtaining false positive results and increasing the frequency of subsequent follow-up. Testing more frequently than every 3 to 5 years is not only costly, but also results in only marginal additional protection.^{1,5,6}

False negative results can occur because some tumours do not exfoliate cells (real false-negatives), because the test-taker has taken a poor sample, or because the laboratory cytologist has made a wrong diagnosis. Invasive cancer may also occur despite screening because the patient or the doctor did not properly follow up an abnormal test result. Studies from Europe suggest that poor follow-up is a serious and common reason for the development of cervical cancer among previously tested women.¹² Hence, we must improve not only test-taking procedures, but also the follow-up rate of patients with suspected cases of cancer, and laboratory quality control.

A well-planned screening programme must actively reduce the false-positive as well as false-negative rates in a cost-efficient way. If 2% to 4% of women are given a test report that recommends follow-up or a repeat screening; the consequence is a total lifetime risk of more than 50% of having at least one positive test result during 12 to 15 screenings between the ages of 20 and 70 years. Some laboratories have recommended the follow-up of 8% of all women; this proposal is a sign of an excessively active approach that will yield a high false-positive rate.

Conclusion

Many lessons can be learned from studying the way in which European countries have handled the planning

of cervical cancer screening over the past 25 years. Firstly, a prevention strategy must be used to find a balance between primary prevention and the early detection of cervical cancer. Secondly, governments must actively plan and make explicit decisions regarding the allocation of resources. Thirdly, health care planners and clinicians must cooperate to create effective and feasible procedures. Finally, the medical profession must formulate appropriate and cost-effective quality assurance procedures to monitor their activities, and must be responsible participants in health care programmes.

Most countries in Europe now run good programmes. The evidence for this fact is that fewer women are dying from cervical cancer.^{5,8} Nevertheless, not all clinicians understand the complexities of formulating and implementing a screening programme and not all health care planners have a structured approach to decision making. Teaching medical decision making and how to create a good health care system must continue.

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