Better management of the system is essential

An effectively managed programme of cytological screening for preinvasive neoplasia of the uterine cervix may reduce substantially the incidence of cervical cancer and its associated mortality. Computer modelling studies of the neoplastic sequence suggest that reliable screening at five year intervals might reduce the incidence of invasive disease among screened women by 85%; three yearly screening might reduce it by over 90%.

Simulation studies suggest that the greatest reductions will be achieved by the most complete coverage of the population—even if this is at the expense of a reduced number of screenings for each woman (D May, PhD Thesis, University of Manchester, 1979). In short, more is achieved by screening every woman five times than by screening half the population 10 times.

Although none of these calculations has been confirmed by population trials, mortality from cervical cancer in countries with screening programmes based on these principles has decreased more than that in similar countries without such programmes. But in countries with well managed programmes there has usually been opportunistic screening over and above that prescribed by the national programmes. Furthermore, countries that are assiduous in screening much of the population may perform better in other parts of the programme—for example, in detecting cytological abnormality accurately and in investigating and treating any abnormality efficiently.

More people seem to be screened if the initiative required for securing attendance is transferred from the target population to the providing service. The use of computer based management to achieve good population coverage has a long history, beginning with the developments in West Sussex for managing immunisation of children. The same system was extended to cervical screening, and Scandinavian countries have used computers for other screening procedures. In Britain the national commitment to computer managed cervical screening dates from 1985, when the Department of Health and Social Security recommended that health authorities establish call and recall schemes in conjunction with family practitioner committees. The principal characteristics of successful programmes are that they are consumer oriented but service initiated. In Manchester we have used the acronym COSI to describe such management systems.

Principles of a screening system

The principles of a good management system for cervical screening are understood.

- It should aim at complete coverage of the target population
- It should ensure that women are recalled for repeat tests at suitable intervals
- The invitation to attend should incorporate health education that takes account of the efficacy, function, relevance, and acceptability of the test
- The provider of the service should seek to deal in advance with women’s fears and anxieties
- Women should be offered some choice of both appointment and venue for the smear test.

The requirements for effective implementation are also well established.

- There must be an accurate listing of the target population that contains up to date addresses and screening history; ideally, it should be a computer database
- Procedures must exist for making and changing appointments for women to attend a venue of their choice. The invitations should emanate ostensibly either from the woman’s own general practitioner or from some identified legitimate source. Much of this can be achieved by computer software
- Smears must be promptly examined and the results reported to the women, their general practitioners, and the management system. Ideally the reports should follow an agreed (preferably national) format
- Management procedures must be available to advise on the best course of action in the case of a positive result and for monitoring prompt execution of this course of action
- The system must be able to implement repetition of these procedures regardless of changes of address or responsibilities of any of the parties to the system.

Experience of the system

In practice none of these requirements seems to be easy to realise.

Regular Review

Making cervical screening work
THE DATABASE

No suitable computerised database for cervical screening exists in Britain. Early experiments in West Sussex, replicated later in Cheshire, 4,1 made use of electoral registers, but these do not record gender and are variably complete. Almost the only usable listings of the population are the lists kept by the family practitioner committees to pay general practitioners' capitation fees. Unfortunately, the addresses they contain are not up to date; no routine mechanism exists for updating them if women move without changing their general practitioner. The result is that in urban areas such as Manchester and Salford up to a quarter of the addresses on the register are incorrect 7-12 and many invitations do not reach their intended recipients. Another serious problem with this database is that it cannot easily be updated with information on a woman's screening history. The absence of software to expedite information exchange among screening laboratories and family practitioner committee registers results in a heavy workload for already hard pressed staff and substantial delay in updating; consequently many women receive invitations when they may be ineligible because of a recent test.

The whole system depends on two operations: firstly, the laboratory must send the results of the test to the family practitioner committee; and, secondly, the staff of the family practitioner committee must input them into their computer in a way that allows them to be communicated promptly to the women and the tabulated results to be supplied periodically to the district health authority, which has a responsibility to compile statistics. The postcode of the address identifies both the family practitioner committee and the district health authority to which the woman belongs. Inadequate provision has been made for recording this code on the family practitioner committee's dataset.

Prompt examination of smears demands considerable resources; in a district of average size there are about 20,000 smears a year to be examined, a substantial workload. Yet for a cervical screening service to operate successfully smears should be examined promptly and the results reported, ideally, within one week and certainly within one month afterwards.

FREQUENCY OF SCREENING

Regular rescreening provides some safeguard against missed positive results, but the frequency of screening is a main determinant of costs. A related issue is whether to discourage more frequent screening than is envisaged by the programme's policy—and if so, how. At present in Britain screening resources sufficient for regular coverage of the entire population are being concentrated on more frequent screening of younger women—commonly those at less than average risk. This may well be a major reason for Britain's lack of success in reducing the incidence of cancer.

SERVICE PROVISION

Women may fail to attend for smear tests because of inconvenient appointment times or venues and lack of suitable arrangements for their alteration, absence of women staff to take the tests, and problems of communication in women who cannot read or who do not speak English. 10,14 All these practical difficulties take place in the context of fragmentation of responsibility for screening, which permits unintended modifications to the system and gives rise to problems of effective liaison among the different elements. 14

ATTITUDES

The "hard core" of intractable resistance to cervical screening is probably much smaller than has been assumed, although much more effort will be required to estimate it correctly. Refusal in some women stems from misconceptions about the function of the test and about the circumstances in which it is appropriate to undergo it—misconceptions that are common in both popular and medical media; even those who attend may be embarrassed about testing, and fear of cervical cancer and pessimism are still found in some women. 10-12

IDENTIFICATION OF IMPORTANT CYTOLOGICAL ABNORMITY

Truly important cytological abnormality denotes neoplastic change destined to proceed to invasion in the absence of intervention. Its prevalence may be estimated in principle from the incidence of cancer and the duration of the detectable preinvasive state. The incidence of invasive cancer has not varied beyond 20 to 30 per 100,000 women each year (0-02-0-03%), and the preinvasive state probably lasts for between one and 10 years. Therefore, the prevalence of truly important cytological abnormality is probably between 0-02% and 0-3%—certainly well below 1%.

The prevalence of reported abnormality in most screening laboratories is higher than this. Many innocent abnormalities are thus being detected, and we do not seem to be able to distinguish them from those that are important. Unfortunately, detecting a cytological abnormality is worrying for the women concerned and expensive. If the roughly 20 million women in Britain were screened every five years and only 1% were referred for colposcopy 40,000 colposcopies would be performed a year. But if the higher detection rates currently being advocated 13 were general this figure might be 200,000. At about five colposcopies for every gynaecological session this is the whole time equivalent of about 100 gynaecologists. There are at present about 700 gynaecologists in Britain for all gynaecological and obstetric work. Clearly the discriminatory power of the cytological procedures requires urgent attention, and the general provision of cytological screening has important implications for gynaecological staffing.

Courses of action

THE DATABASE

Updating family practitioner committee files from other listings, such as the electoral register, is not easy—partly because of their incompleteness but mainly because they are kept in a different sequence. If both electoral registers and family practitioner committee files recorded postcodes and this could be ordered by postcode their cross comparison would be easier, but postcodes are still not recorded routinely in either register. Alternatively the procedures for maintaining family practitioner committee files might be revised. For example, it would be useful to develop procedures for updating the addresses in the files, although the problem of patients who had not informed their general practitioners of a change of address would still remain. The problem of updating family practitioner committee files on the outcome of screening examinations is intractable without software for entering data other than by key punching and without a simple means for identifying the family practitioner committee from information available to the laboratory. Collecting postcodes on examination request forms would be an important advance.

More automated reporting procedures are difficult to introduce without a convenient code for identifying the family practitioner committee to which the report must be made. The current database specification for family practitioner committees does not permit recording the postcode as a separate field. This omission also hampers the preparation of district statistics when either laboratories or family practitioner committees serve a different catchment population from that of the district.
FREQUENCY OF SCREENING

Whether more frequent screening might reduce the proportion of women referred for further investigation and what the resultant cost might be are not known. What is clear is that until all women at risk are screened, any resources devoted to increasing the frequency of screening would be misapplied. In Britain between a third and a half of all the women at risk of developing cervical cancer have never been screened[16][17]; these women must be the priority target.

There are three courses of action to deal with unnecessarily frequent screening. The simplest course would aim at covering all women at least at five yearly intervals and accept that additional opportunistic screening would do little harm and possibly some good. Another course would be to adopt the same policy in the hope that it would eventually become normal to be screened only at invited appointments. An alternative course might be to discourage smears except at invited appointments, which would probably be difficult to achieve and unpopular, and, although it would permit a more rational use of resources, it might fail to reduce adequately the incidence of cervical cancer. Opportunistic screening does allow women to be screened even if their correct addresses are not recorded on family practitioner committee files.

SERVICE PROVISION AND ORGANISATION

Another issue to be resolved is whether the invitation for screening should be sent out directly from the family practitioner committee or through the general practitioner. The advantages of the letter coming directly from the family practitioner committee are that a standard procedure is followed across the district and that undelivered letters are returned directly to the database. The advantage of sending the letter through the general practitioner is that a specific time and date of appointment may be offered, which are more likely to produce a better response from older women than an open invitation to arrange a test. In addition, it provides the opportunity to include information from the practice—for example, about the availability of women staff to take the test.

ATTITUDES

A programme of public and professional education is needed about the goals and procedures of cervical screening, which must be made more explicit. Cervical screening does not and cannot aim at diagnosing all cases of early cervical cancer; it aims at reducing the incidence of the condition in the population by detecting and treating much of the neoplasia that precedes it.

DETECTION OF ABNORMALITIES

The purpose of cervical cytological screening is to identify women who should benefit from further investigation and possible treatment. The ideal would be to treat all women with preinvasive neoplasia destined to proceed to invasion—and only those women. In practice the aim is to ensure that as few women as possible proceed to invasive disease while subjecting as few as possible to medical intervention. The balance is difficult; at present the screening system fails to detect all but a few potentially invasive lesions and subjects many women to unnecessary investigation and treatment.

It is important to try to ensure that a major cytological abnormality is usually detected and that women in whom it is detected are referred for further investigation. The first step is to ensure quality control in cytological laboratories. Examining screening smears when well over 90% are expected to be normal is different from examining specimens from people with important symptoms and a consequent expectation that many will be abnormal. In almost all simple screening procedures there is a high proportion of missed positives (false negatives) unless independent rescreening is an integral part of the procedure.

Few laboratories seem to have satisfactory internal assessment of quality, and almost none have external assessment, although schemes for periodically assessing the competence of individual screeners are being introduced. A serious difficulty is that agreement among competent observers is not good—especially if degrees of cytological abnormality are to be distinguished. There have been few serious attempts to assess consistency of judgment on a large scale.

Computer-managed cervical screening represents an opportunity to prevent serious disease. We have identified many of the barriers to its effective implementation in Britain from published reports, research by ourselves and others, and our commitment to developing a cervical screening service over more than two decades.19

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