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Editorials

Screening for colorectal cancer

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Should be tailored to available resources, local experience, and population characteristics

Colorectal cancer is the second most common cause of death from cancer in Europe and the United States.**1 2** Population screening trials using the guaiac faecal occult blood test have reduced mortality by around 16%.**3** National or regional colorectal cancer screening programmes and pilot studies for the general population have recently been introduced in more than 50 countries.**4** Such organised screening programmes are the best way to reduce the incidence of colorectal cancer.

In the linked study (doi:10.1136/bmj.a2261), Malila and colleagues report the test, episode, and programme sensitivities for a new randomised method of introducing population screening for colorectal cancer in 2004 in Finland.**5** Test sensitivity refers to the proportion of colorectal cancer cases detected by the test in the preclinical phase of the disease. Episode sensitivity is a function of test sensitivity (confirmed by diagnostic testing) that incorporates interval cancers not detected during the time between screening tests. Programme sensitivity is a much broader concept and is based on the proportion of total cancers detected for all people invited to participate in screening (that is, those who do and do not return the test kits).

The participation rate of 71% will be viewed with envy by many other programmes. The higher participation rate in women than in men confirms the findings of other studies of population screening using the faecal blood test. In contrast, uptake for endoscopic screening is widely reported as being higher in men than in women.**6**

Screening aims to diagnose disease while it is curable and so prevent future deaths. It is important therefore to minimise the proportion of interval cancers (those that occur in the time between screening rounds) and maximise the proportion of cancers identified by screening. Sensitivity is defined as the ability of a test to identify a disease. The test sensitivity of 55% for the guaiac faecal blood test reported by Malila and colleagues is similar to that seen in previous European randomised controlled trials.**7 8**

The authors hold that the reported test, episode, and programme sensitivities are important measures for evaluating the effectiveness of a screening programme. However, the use of programme sensitivity as an

outcome measure for a cancer screening programme should be treated with caution. Programme sensitivity is a direct function of the participation rate, so population uptake (for the faecal blood test and colonoscopy) must be high for programme sensitivity to be similar to episode sensitivity.

A major weakness of faecal blood test screening is its low sensitivity. But other aspects of a programme must also be taken into account to determine its effectiveness. Firstly, specificity—the relatively low programme sensitivity of 37.5% reported by Malila and colleagues might be compensated for by an acceptable specificity, which would reduce the number of false positives that cause unnecessary anxiety and require invasive diagnostic procedures to be carried out. Secondly, attendance at colonoscopy—was the episode sensitivity of 51% a function of accessibility to colonoscopy or did it represent other factors (such as inadequate bowel preparation, particular subgroups being reluctant to undergo the procedure)? Attendance at colonoscopy is fundamental to reducing the incidence of and mortality from colorectal cancer. Thirdly, informed decision making by participants—were participants satisfied that they had been given pertinent information about the benefits and risks of screening (such as the ability of screening to detect colorectal cancer and potential complications associated with colonoscopy)?

The authors report that test and episode sensitivity were considerably higher in men than in women (14% higher for test sensitivity and 11% for episode sensitivity). In contrast, the incidence of interval cancers was higher in women than in men (49 *v* 42 per 100 000 person years). Do these differences mean that screening for colorectal cancer is more effective in men than in women, or should other factors be considered?

As anticipated on the basis of the epidemiology of colorectal cancer,**9** evidence shows that the benefits of screening are seen some years later in women than in men. A study in Poland and screening programmes in Italy found that men reach a given prevalence of colorectal cancer and level of detection of advanced adenomas some five to 15 years in advance of women.**10** **11** This has prompted the suggestion that sex specific screening for colorectal cancer may be warranted,**12** although this may be difficult to achieve in practice.

The difference in the location of colorectal cancer in men and women is also important—cancer in the distal colon and rectum is less common in women than in men. Consequently, the sex difference in the occurrence of distal colon cancer is even more pronounced than that of the overall occurrence of colorectal cancer. Mean sojourn time—the time before clinical symptoms become apparent but during which the disease is detectable—differs greatly by subsite. The tumour growth rate is considerably slower for distal colon cancer than for proximal or rectal cancers.**13** It could be unreliable and misleading to consider the sensitivity of the faecal occult blood test without taking into account mean sojourn time, tumour subsite, the screening interval, and sex differences.

The new design for implementing the Finnish colorectal cancer screening programme allows for the screening interval, screening modality (for example, the introduction of an immunochemical faecal occult blood test), and age at beginning of screening to be monitored and modified if necessary. However, many programmes will have to be phased in on the basis of the availability of facilities, the experience of health professionals, and the capacity of the service provider. Also, achieving informed consent from the entire target population for participating in this type of programme implementation may be a problem for many countries. Therefore, logistically, randomisation may not be possible in many situations, and implementation will depend on local circumstances.

Notes

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Footnotes

- Research, doi:10.1136/bmj.a2261

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