

Screening and health promotion

Michael P Kelly

Abstract

There are disadvantages and benefits of population screening programmes. Although there is widespread public and political support for screening programmes of all kinds, important criteria must be applied before screening is introduced. The difference between population screening and opportunistic case-finding is identified here, and the costs, as well as the benefits, associated with screening are outlined. The importance of the difference between the sensitivity and the specificity of a test used in screening is explained. The economics of screening is considered, along with ethics and the importance of properly managing and evaluating screening systems. The current situation in the UK is described.

Keywords Costs and benefits; ethics; evaluation; population screening; screening criteria; test sensitivity; test specificity

Introduction

Many members of the public, politicians and even some clinicians think that screening for undiagnosed disease is unequivocally good, sometimes likened to an MOT test on a car.¹ For-profit health organizations and certain disease-specific charities also recommend screening as something that will promote good health. In this paper, the disadvantages and costs of screening, along with its advantages and benefits, are outlined.

Definition

There are several definitions of screening:

- The UK National Screening Committee defines screening as ‘a public health service in which members of a defined population, who do not necessarily perceive that they are at risk of, or are already affected by, a disease or its complications are asked a question or offered a test to identify those individuals who are more likely to be helped than harmed by further tests or treatment to reduce the risk of disease or its complications’.²
- Raffle and Gray define screening as ‘Testing of people who either do not have or have not recognized the signs or symptoms or the condition being tested for ... they believe themselves to be well in relation to the disease the

Michael P Kelly BA Hons M Phil PhD FRCP Hon FRCP Edin FFPH is Senior Visiting Fellow in the Institute of Public Health, University of Cambridge, UK. He was Director of the Centre for Public Health at NICE from 2005 until his retirement in 2014. His research in Cambridge includes health inequalities, evidence-based medicine, end-of-life care and health-related behaviour change. Competing interests: none declared.

Key points

- There is widespread support for screening but it is not the panacea for promoting good health that many suppose
- Population screening is not the same as opportunistic case finding
- There are key criteria that must be applied before a programme of population screening is introduced
- There are costs (medical, social, psychological and economic) of screening, as well as benefits
- There are always false-positive and false-negative results in any screening test
- Population screening should only be implemented through nationally conducted, quality-assured and managed programmes
- The current arrangements for population screening in the UK are overseen by the National Screening Committee

screening relates to ... the stated or implied purpose is to reduce risk for that individual ... in relation to the condition being tested for, or to give information about risk that is deemed valuable for that individual even although risk cannot be altered. It encompasses the whole system or programme of events necessary to achieve risk reduction. Screening is a programme not a test.¹

- Holland and Stewart define screening as ‘actively seeking to identify a disease or pre-disease condition in people who are presumed and presume themselves to be healthy’.³

These definitions refer to population screening, which is not the same as opportunistic screening for prevention or case-finding. The latter occurs where individuals have medical contact for some reason and the opportunity is taken to do other tests such as measuring blood pressure or cholesterol concentration. This paper is concerned with population screening.

Criteria for screening

Raffle and Gray put it bluntly: ‘All screening programmes do harm. Some do good as well and, of these, some do more good than harm at reasonable cost.’ They argue that ‘evidence of more good than harm at affordable cost must precede widespread introduction.’¹

As a consequence, there are a number of criteria, first outlined by Wilson and Jungner in 1968,⁴ that should be met before any kind of screening is contemplated.

- 1) The condition sought should be an important health problem.
- 2) There should be an accepted treatment for patients with recognized disease.
- 3) Facilities for diagnosis and treatment should be available.

- 4) There should be a recognizable latent or early symptomatic stage.
- 5) There should be a suitable test or examination.
- 6) The test should be acceptable to the population.
- 7) The natural history of the condition, including development from latent to declared disease, should be adequately understood.
- 8) There should be an agreed policy on whom to treat as patients.
- 9) The cost of case-finding (including diagnosis and treatment of patients diagnosed) should be economically balanced in relation to possible expenditure on medical care as a whole.
- 10) Case-finding should be a continuing process and not a 'once and for all' project.⁴

These principles, broadly speaking, remain the cornerstones of screening practice in the UK.^{2,3} The criteria have evolved and been refined. Current practice in the UK is governed by the UK National Screening Committee, which comes under the auspices of Public Health England (see Further reading).

Costs and benefits of screening

The reason that these criteria have to be applied is that there are costs and risks attached to screening.

- **First**, if the condition cannot be changed by diagnosing it, there will simply be a period of associated anxiety if it is diagnosed early.
- **Second**, there is the possibility of overtreatment: individuals who have been diagnosed will be treated, but the benefits of treatment may be equivocal or harmful. The assumption that early diagnosis in a pre-symptomatic person will necessarily lead to a cure is misguided. Rather, it is the nature of the disease itself, and its natural history, that is important.
- **Third**, actively going out and finding cases through screening, rather than patients themselves approaching services for help, adds to healthcare costs and uses up clinicians' time. All positive tests have to be followed up, and a diagnosis confirmed.
- **Fourth**, a negative test result may give people false reassurance, so they might continue to behave in ways that put their health at risk; alternatively, the screening process may lead to unnecessary anxiety and worry in an otherwise healthy person.
- **Finally**, there may be hazards associated with the test itself, such as from radiation or some other invasive procedure.⁵

Tests are never 100% accurate. The sensitivity and the specificity of tests have to be considered here:

- The *sensitivity* is the proportion of people who have the condition and have a positive result from a test.
- The *specificity* is the proportion of people who are actually disease-free and are classified as having a negative result.

Because tests are never completely accurate, there will be a proportion of people who actually have the condition but who come up as negative on testing (*false-negatives*); there will also be a proportion of people who do not have the condition but who come up with a positive result (*false-positives*). Positive and negative values are influenced by the prevalence of the condition

in the group being tested. The same test will produce higher predictive values when applied in a high-prevalence group than in a low-prevalence group. It is important to note in this context that a screening test is not a diagnostic test – further investigations would follow a positive result in order to confirm the diagnosis. All this adds to the service's workload.

There are of course benefits from properly conducted screening programmes. There will be an improved prognosis for some of the cases detected. There may also be less need for radical treatments where the disease is found early; this can lead to resource-saving, and people with a negative result will be reassured.⁵

The economics of screening

Aside from the cost and time of treatments, and the anxiety of people being screened, two other important economic considerations come into play. First, spending resources on screening means that budgets cannot then be spent on something else. Enthusiasts of screening seldom consider this economic reality.

Second, it needs to be determined whether the expenditure is good value for money (in other words, is it cost-effective)? The economics involved are complex and depend on the:

- number of cases found
- amount of morbidity that is really averted (which is not the same thing as the number of cases found because a proportion of these will involve disease that would never have progressed to be symptomatic)
- number of cases found and treated compared with the total of number of people who have to be screened.

This in turn will be influenced by the degree to which the screening system is effective and efficient, in other words the way it is implemented, managed and quality-assured.¹ It therefore cannot be assumed that prevention through screening is necessarily cheaper or better value for money than cure.

Screening systems

Quality assurance is important. If screening is worth doing, it is only worth doing if it is done well.¹ It is vital that any screening programme is very carefully managed, implemented, monitored and evaluated. If the nuts and bolts of the process (the record-keeping, the coverage of the population that should be screened), if there are variations in the way that different centres conduct the screening, and if the tests are prone to human error, all these mean that the scope for mistakes is ubiquitous. It also means that population screening should be conducted by national programmes. The screening must be done using universal methods, techniques, tests and procedures, and with specialized staff trained to the same standard. The process should not be devolved to independent teams implementing the programme according to local and idiosyncratic processes. This only leads to error and brings systems into disrepute.

Ethics

Important ethical issues are also raised by screening. A basic ethical principle is to 'do no harm'. But in respect of screening, how certain are we that the anxieties produced, the treatments instigated, the resources not spent on other things, are not

Download English Version:

<https://daneshyari.com/en/article/8763987>

Download Persian Version:

<https://daneshyari.com/article/8763987>

[Daneshyari.com](https://daneshyari.com)