43 Screening and health checks for NCD prevention and control

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The purpose of screening is to identify people in an apparently healthy population who are at higher risk of a health problem or related condition so that an early treatment or intervention can be offered, in order to lead to better health outcomes in those screened.[1] Criteria for identifying a disease suitable for screening have been in existence for over 50 years (Box 43.1).[2]

BOX 43.1 CRITERIA FOR IDENTIFYING A DISEASE SUITABLE FOR SCREENING

- The condition sought is an important health problem.
- The natural history of the condition, including development from latent to declared disease and sequels is well understood.
- There is a recognizable latent/early symptomatic stage.
- There is a suitable and acceptable test or examination.
- There is an accepted, cost-effective and affordable treatment.
- Facilities and resources for diagnosis and treatment are available.
- There should be an agreed policy on whom to treat as patients (protocols for diagnosis and treatment).
- The cost of case-finding (including diagnosis and treatment) is economically balanced in relation to expenditure on medical care as a whole.
- Case-finding is a continuing process and not a 'once and for all' project.

More recently, policy-orientated criteria have been proposed (Box 43.2).[3]

BOX 43.2 POLICY CRITERIA FOR SCREENING

- The screening programme should respond to a recognized need.
- The objectives of screening are defined at the outset.
- There is a clearly defined target population.

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- There is scientific evidence of screening programme effectiveness (the benefits of the screening programme should outweigh the harm).
- There are mechanisms to maximize quality assurance and minimize potential risks of screening.
- The programme ensures informed choice, confidentiality and respect for autonomy.
- The programme promotes equity and access to screening for the entire target population.
- Programme evaluation is planned from the outset.
- The overall benefits of screening should outweigh the harm.

Population-level screening programmes

Mass screening is particularly important for NCDs as many cancers and other NCDs fulfil the criteria set out above, particularly high frequency in the population, a long symptomless period before clinical events develop and effective treatments. The impact of screening is best assessed on the number of deaths avoided or years of life gained per 1000 individuals screened compared with these outcomes in the same population if was not being screened – and the evidence for screening programmes for a number of NCDs has grown substantially over the years.

In addition to the outcomes described above, it is important to take into account the cost-effectiveness of screening programmes. Costs need to include the financial, human, technical and other resources (including for quality assurance and accountability) that are required to establish and maintain a programme – which is usually very significant. But in addition, there are costs to individuals and the health system and wider society for those that fall into false-positive and false-negative categories (e.g. the former requiring unnecessary further investigation and possibly unnecessary treatment, and the latter being falsely reassured) (Figure 43.1). For example, in the United Kingdom, for every 1000 women 50–70 years old invited to screening for breast cancer every three years, it is estimated that four women will have their life saved from breast cancer but 13 women will be incorrectly diagnosed, and possibly treated, for cancer that would not have harmed them.[4] In Belgium, a similar approach estimates that for every 1000 women 50–59 years screened every two years, three women will have their life saved from breast cancer and three women will be overdiagnosed and possibly harmed by unnecessary treatment.[5]

It is also important to appreciate that screening programmes can sometimes be established because of pressure from lobby groups. Overall, these groups as well as the public tend to overestimate the benefits and underestimate the harm that comes from screening. Importantly, once established, screening

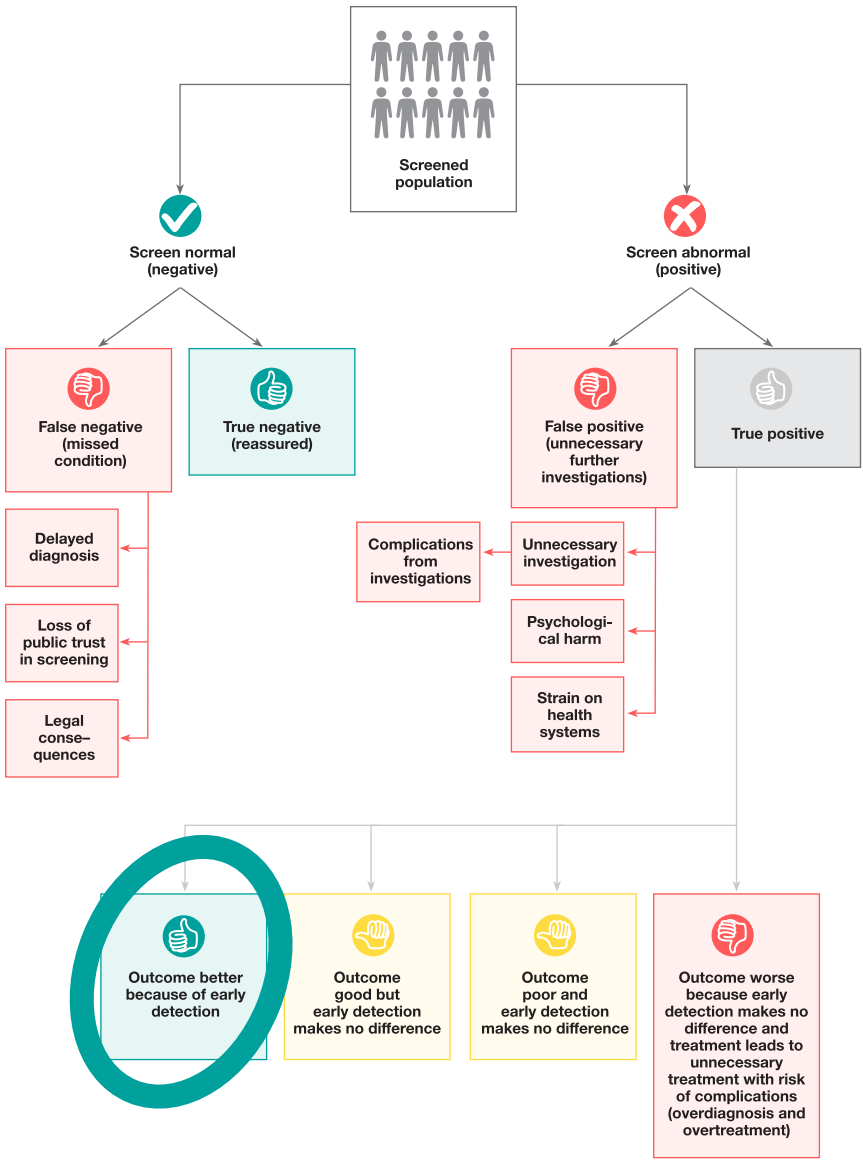

Figure 43.1 The benefits and harms associated with a screening programme. (Screening programmes: a short guide. Increase effectiveness, maximize benefits and minimize harm. WHO Regional Office for Europe; Copenhagen, 2020).

programmes can be very difficult to disband. Piloting a screening programme in a small area before scaling it up to the regional or national level is therefore a prudent approach. It goes without saying that a screening programme should be established only if there is access for all those screened as positive to the necessary diagnostic tests, treatment and follow-up required – and this needs to be factored into the decision (including budget) on setting up a screening programme.

In addition, care needs to be taken when extrapolating the results of an evaluation of a screening programme for the same condition from one country to another. Differences in disease burden, population structure and health systems mean that conclusions in one country may not apply to another country. Again, this highlights the importance of undertaking pilots. Nevertheless, national and international guidance (for example from WHO, the International Agency for Research on Cancer (IARC), the UK's National Institute for Health and Care Excellence (NICE), the United States Preventive Services Task Force (USPSTF), and the European Commission) is available (including information on how and when to establish, and how to evaluate screening programmes).

Traditionally, the evaluation of screening programmes has focused more on the risks and benefits for individuals than on the overall cost-effectiveness (e.g. $ per DALY averted) and long-term affordability of the programme. More recently, greater emphasis is being placed on the economics of screening programmes. Economic arguments need to take into account that even programmes that may require an expensive screening tool and/or treatment can be cost-effective if they reduce mortality and future need for expensive treatment and follow-up that would arise from treatment at later stages of the diseases (e.g. colonoscopy for colorectal cancer screening).

Organized systematic screening programmes for NCDs targeting the entire population

These are designed and managed by national or regional health services and target the whole population (or groups of them) to ensure that everyone has an equal opportunity to participate and benefit. Everyone who takes part is therefore offered the same services, information and support. High levels of quality control, external monitoring and evaluation and accountability are in place.

They usually involve a large engagement of primary health care but also require strong support from secondary levels (e.g. colonoscopy for colon cancer, complex imagery or biological techniques for breast cancer, complex and/or long-term treatment and/or surgery). These programmes must be carefully considered because of the large resources involved and the difficulty to stop them once started. Decisions will depend on resources in a country. As in Figure 43.1, the benefits and harm need to be weighed up carefully.

Screening programmes for cervical, colon, prostate and breast cancers are described in chapters on these diseases. Those for other NCD conditions such as aortic artery aneurysm are not covered in this compendium.

Opportunistic screening for NCDs

Opportunistic screening is when individuals are screened outside an organized programme. Although this is not screening in the formal sense, such activities are often referred to as 'screening' in popular parlance. Opportunistic screening may not be subject to the same checks, balances and quality control as for an organized screening programme. Opportunistic screening may be used when organized screening is not available, for example for lack of resources (e.g. in countries where cervical cancer programmes have yet to be established) or for an individual who does not meet the criteria for participating in an organized screening programme (e.g. screening for breast cancer in a young woman where there is a strong family history). The benefits, risks and harms of opportunistic screening (for example PSA testing for prostate cancer) need to be discussed with the individual before a shared decision is made on whether to undergo screening.

Opportunities should be taken by health professionals to use consultations to 'screen' for NCD risk factors (e.g. tobacco use, harmful use of alcohol, unhealthy diet and sedentary habits) in order to provide appropriate counselling. It is devoid of harmful effects and can be cost-effective, e.g. simple advice to smokers to quit.[6] Such 'screening' is perhaps better considered as a routine component of quality whole-person care.

Health checks for NCDs

Periodic health examinations, commonly called 'check-ups' can take place along organized or opportunistic circumstances, and are undertaken in the community, for example in primary care, the workplace or schools. The main aim of check-ups (in relation to NCDs) is to identify behavioural, physical and metabolic risk factors (e.g. smoking, high blood pressure, elevated blood lipid or sugar levels) among apparently healthy persons.

As NCDs increase with age, the usefulness of check-ups also increases with age, particularly after age 40–50 years. Check-ups may also be extended to those with a strong familial history of a particular condition or those with potential comorbidities (e.g. screening for hypertension among the obese or those with diabetes of any age), although this latter example may be better considered the provision of ongoing health care for unhealthy persons. Importantly, health checks also allow for a discussion around ways to reduce exposure to risk factors (and where required, the need for medications). Health checks are likely to be more effective when they are done with a health worker who knows the individual well and a trusted relationship is more likely to result in more personalized counselling.[7]

While there appears to be a growing trend towards more health checks of NCDs and risk factors, fuelled by the growing availability of tests for many conditions including point-of-care ones and demand from patients, clear evidence of their effectiveness is often lacking. For example, general health

checks provided in primary care in Denmark did not result in improved mortality,[8,9] perhaps in part because routine health care is already of high quality. A number of issues that pertain to screening apply equally to health checks, e.g. selecting the most appropriate age group, ensuring that those with the greatest need attend (rather than just the 'worried well' or those who can easily access or afford health care), maximizing efficiency by dealing with multiple issues at one time, and establishing the right intervals between repeat health checks.

Decisions on what is made available to a particular population through organized screening, opportunistic screening, or well-health checks depend on a number of factors, including resources, access, availability and affordability of health care.

A framework for the prevention of NCDs at the primary care level

Primary care needs to ensure that screening (both organized and where appropriate opportunistic), counselling and other preventive interventions, such as vaccination, are available for their population. Figure 43.2 is adapted from a more comprehensive illustrative framework recommended for those managing and delivering primary care in Switzerland. The schedule was developed using GRADE (Grading of Recommendations Assessment, Development and Evaluation), which is a systematic approach based on available evidence for making recommendations for clinical practice.[10] Those developing frameworks in a particular country will need to take into account a number of factors, including the available resources, the strength of the evidence base and related recommendations (e.g. what to do when evidence is weak, such as screening for lung cancer with low dose CT among smokers[11] or for prostate cancer using PSA in some individuals[12]), the way health care is organized (e.g. where and how screening and check-ups are provided and financed), and the expectations of the public and the response of primary care to that demand.

Health checks to 'screen' for NCDs at the workplace

Health checks ('screening') may also be offered as part of services granted to employees (similar to subsidized and/or healthy meals or provision of facilities to practice physical activity at a work), and can promote the health and work productivity of the employees. However, this may raise ethical concerns about people's autonomy when people are under pressure to undergo screening either to obtain or retain a certain job.

Health checks to 'screen' for NCDs in schools

Screening at school for some NCD conditions (e.g. body weight) is common in some countries. This can provide good opportunities to assess and address

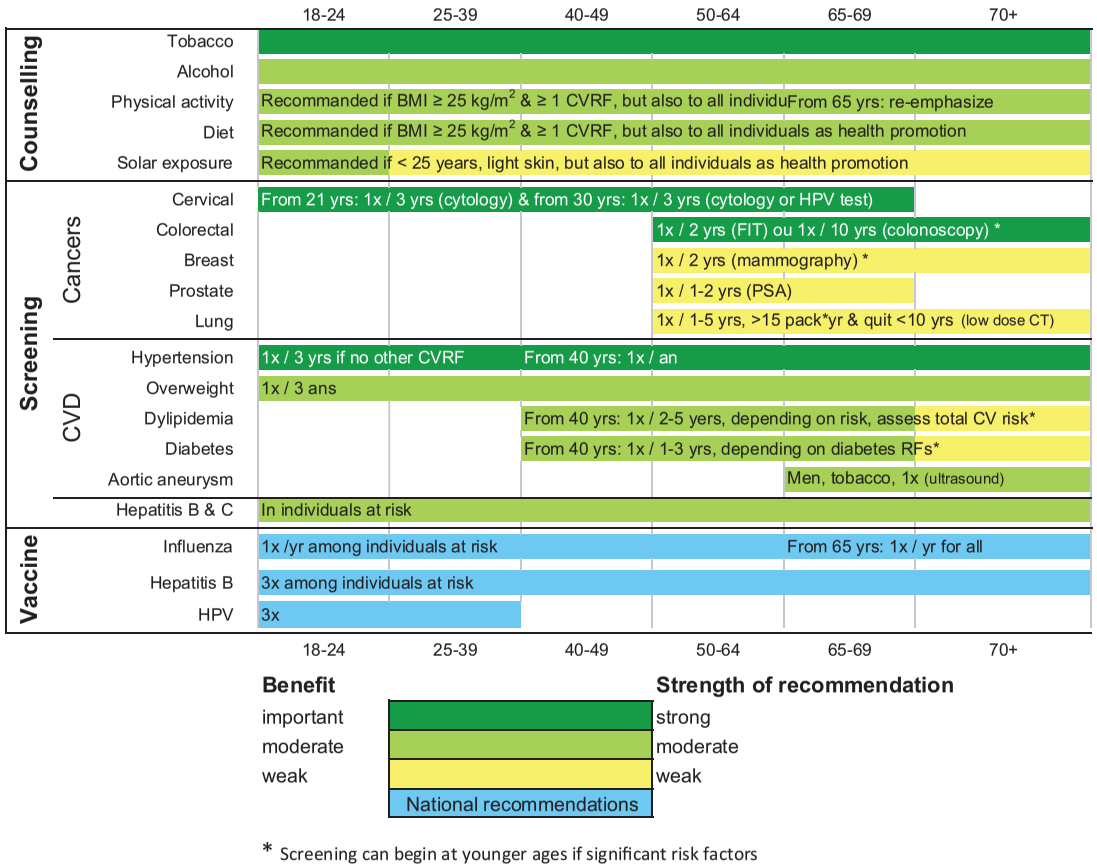

Figure 43.2 Example of a framework for screening, counselling and vaccination for the prevention of NCDs and their risk factors at the primary care level in Switzerland. (adapted from Jacot Sadowski I et al. Recommandations suisses pour le bilan de santé au cabinet médical. *Forum Médical Suisse* 2021;21:888–94).

unhealthy behaviours if relevant services are available to provide quality support (e.g. tobacco use, healthy diet, etc.) on site (e.g. by school nurses) and/or through referral to health services. Respect for dignity and autonomy should be a priority and include, as often as possible, informed consent by schoolchildren.

WHO best buys and other interventions for NCDs that can benefit from screening

The WHO best buys and other recommended interventions include several NCD conditions that can benefit from early detection and treatment (Table 43.1). While some are clearly best undertaken through organized systematic screening, others may be delivered through opportunistic screening programmes or health checks, including when organized screening programmes are not available. It is important to re-emphasize that for any condition screened, treatment must be available and delivered affordably. The interventions in Table 43.1 are described in more detail in other chapters.

Table 43.1 Screening and health checks consistent with the WHO best buys and other interventions for NCD conditions

Screening approach	*WHO recommended interventions*
Organized screening, opportunistic in some settings.	• Cervical cancer for women aged 30–49 years. • Breast cancer for women aged 50–69 years. • Colorectal cancer at age >50 years. • Oral cancer screening in high-risk groups (e.g. tobacco users, betel-nut chewers). • Assessment of cardiovascular disease (CVD) risk to enable drug therapy and counselling to be provided to those at high risk of a CVD event.
Health checks, including 'screening' questions on healthy behaviours in order to advise about…	• Advise smokers to quit and seek support from tobacco cessation services (including telephone based). • Provide brief psychosocial intervention for persons with hazardous and harmful alcohol use. • Provide counselling on healthy lifestyles (including physical activity and diet) as part of routine patient-centred primary health care services, particularly to those at increased CVD risk (e.g. persons with overweight, diabetes and hypertension).
Ongoing care, but referred to as screening in WHO's recommended interventions.	• Screening of people with diabetes for proteinuria and treatment with angiotensin-converting enzyme inhibitor for the prevention and delay of renal disease. • Drug therapy (including antiplatelet therapy) and counselling for individuals who have had a heart attack or stroke.

Notes

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