

WHO European Technical Consultation on Screening

Copenhagen, Denmark
26–27 February 2019

ABSTRACT

The WHO Regional Office for Europe held a Technical Consultation in Copenhagen on 26–27 February 2019 aimed at clarifying the harms and benefits of screening in the light of recent scientific evidence and countries' experience. This Consultation constituted the first step in an initiative by the Regional Office to improve policy decision-making for screening. It was attended by 55 experts from 16 countries, including academics and observers from nongovernmental organizations. Thirteen cross-cutting issues emerged during the meeting, with associated challenges and areas for development or further support from WHO.

Keywords

NEOPLASMS – PREVENTION AND CONTROL
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Abbreviations

AAA	abdominal aortic aneurysm
AF	atrial fibrillation
ANC	antenatal care
CF	cystic fibrosis
CT	computed tomography
CVD	cardiovascular diseases
EU	European Union
HPV	human papilloma virus
IHA	individual health assessment
NCD	noncommunicable disease
NICE	National Institute for Health and Care Excellence
PHC	primary health care
PKU	phenylketonuria
PPV	positive predictive value
QA	quality assurance

Introduction

In recent years, countries in the WHO European Region have been introducing new screening programmes for conditions and health checks along the life-course. However, policy-makers, health professionals and the public are not adequately aware of the potential harms of screening as well as the costs and requirements of implementing an effective screening programme.

With this in mind, the WHO Regional Office for Europe held a Technical Consultation in Copenhagen on 26–27 February 2019 aimed at clarifying the harms and benefits of screening in the light of recent scientific evidence and countries' experience. This Consultation constituted the first step in an initiative by the Regional Office to improve policy decision-making for screening. It was attended by 55 experts from 16 countries, including academics and observers from nongovernmental organizations. The sessions were chaired by the programme managers in the Regional Office's Division of Noncommunicable Diseases and Promoting Health through the Life-Course, all of whom had been involved in the preparations for the Consultation. The rapporteur was Sue Cohen, a WHO consultant. A list of background papers is at Annex 1, the programme is in Annex 2 and the list of participants is in Annex 3.

Opening, concepts and principles of screening and horizon scanning

The Consultation was opened by Bente Mikkelsen on behalf of the Regional Office, who welcomed participants to Copenhagen and thanked colleagues for arranging the Consultation on this important topic. She asked participants to share their experiences and identify the gaps in knowledge and understanding so that these could be addressed in a future work programme.

There were important challenges that this topic area posed for all Member States. The positive response that screening often engenders from the public and governments was contrasted with the reality that screening has harms and can frequently create capacity issues for diagnostic and treatment services. The aim of the Technical Consultation was to take a multisectoral approach to cover the whole life-course.

Lastly, Ms Mikkelsen thanked the German Federal Ministry of Health, who were sponsoring the Consultation.

Provisional agenda and expected outcomes

Jill Farrington from the Division of Noncommunicable Diseases and Promoting Health through the life-course added her welcome to participants and thanked colleagues from WHO secretariat teams, WHO collaborating centres, technical experts and policy-makers from Member States for their contributions and support in developing the background material for this Technical Consultation.

There had been a growth in the popularity of screening and health checks across the Region, but there was considerable variation between countries in their approach to screening. It appeared that decisions whether to screen were often not guided by the evidence but could be influenced by other factors. In addition, the quality of screening was variable, so that the benefits were not fully realized.

The Meeting reviewed the agenda and expected outputs from the Consultation. The key principles and criteria for successful screening included considerations of ethics, equity and cost-effectiveness. The Consultation would explore country perspectives, a health systems approach and implementation and de-implementation of screening programmes. The outcomes of the Meeting would inform a set of policy briefs, recommendations for further research and a pan-European Conference later in the year.

Screening in noncommunicable diseases and through the life-course: definition, scope, principles, cross-cutting issues, benefits and harms

The first presentation and background paper No. 1 reviewed the principles and concepts of screening. Screening was defined in the WHO publication on the principles and practice of screening for disease by Wilson & Jungner in 1968 (1) as:

“... the presumptive identification of unrecognized disease or defect by the application of tests, examinations, or other procedures which can be applied rapidly. Screening tests sort out apparently well persons who probably have a disease from those who probably do not. A screening test is not intended to be diagnostic. Persons with positive or suspicious findings must be referred to their physicians for diagnosis and necessary treatment.”

The aim of screening is to lower mortality and/or morbidity and decrease the incidence of the target condition or risk factor.

Participants reviewed the principles described by Wilson & Jungner.

1. The condition should be an important health problem.
2. There should be a treatment for the condition.
3. Facilities for diagnosis and treatment should be available.
4. There should be a latent stage of the condition.
5. There should be a test or examination for the condition.
6. The test should be acceptable to the population.
7. The natural history of the condition should be adequately understood.
8. There should be an agreed policy on whom to treat.
9. The total cost of finding a case should be economically balanced in relation to medical expenditure as a whole.
10. Case-finding should be a continuous process, not just a ‘once and for all’ project.

Although these principles had stood the test of time and remained extremely useful, participants felt that some aspects could benefit from updating.

Decision-making in screening could be influenced by different ethical perspectives including utilitarianism, deontology,¹ *primum non nocere* (first, do no harm) and autonomy versus paternalism.

¹ The study of the nature of duty and obligation.

Views of equity and how this applies to populations could impact on decisions. Screening has a propensity to increase inequity because the wealthy well are more likely to take up the offer of screening. In view of this, countries needed criteria in addition to Wilson & Jungner's principles to guide decisions on whether to screen for different conditions. To be of use, these need to reflect countries' values and preferences and their local health economy.

A decision whether to screen needs to consider the net benefits compared to harms for the population screened. Benefits may include reduced mortality, less radical treatment, reduced morbidity and reduced incidence. Harms may include longer morbidity, overdiagnosis, false-negative results, false-positive results, overtreatment, induced morbidity, induced mortality and increased distress (2). Harms had not always been collected or quantified in trials evaluating the effectiveness of cancer screening programmes.

The landscape and context of screening is complex and changing, and understanding of it has developed since the publication of Wilson & Jungner's seminal work. For example, it is now known that screening programmes can place considerable pressure on health services and systems. In addition, overdiagnosis – where individuals are diagnosed with a disease at screening which, if it had not been found then, would not have caused them any harm – was not understood at the time. One effect of overdiagnosis is that it contributes to the 'popularity paradox', where survivors' stories encourage support for screening and can overestimate its benefits.

A further focus is needed on how science is translated into policy. For example, explicit note should be taken of countries' and populations' values and preferences when the criteria for screening are drawn up, priorities should be articulated and the harms and benefits should be communicated.

Further challenges will include incomplete science (for example, current estimates of overdiagnosis lie in the range 0–41%), the need to improve the definition and measurement of harms, the lack of evidence-based strategies to mitigate harms, and how to deal with 'emotional epidemiology' when decision-making is swayed by emotion from pressure groups rather than evidence.

Screening: what is on the horizon?

The presentation started with an exploration of the difficulty of predicting what will be coming over the horizon and instead proposed that there is a need to focus on using the evidence currently available more effectively.

First, there are areas where less could be done. An example is the lung cancer screening being carried out in the United Kingdom (England), which is labelled by its advocates as case-finding to get around the lack of endorsement by the National Screening Committee. Current evidence indicates a disease-specific but not overall reduction in mortality, and there is evidence that it will not be cost-effective. Another example is screening for atrial fibrillation which is being promoted in many parts of England. Evidence of the benefit of treatment comes from patients identified when attending for other reasons, not from universal screening.

Second, more could be done where the evidence is good before new screening programmes are introduced where the evidence is weak. An example is the management and control of hypertension, where in Sweden only 30% of people with hypertension were treated even though the treatment will save lives.

Third, new ways could be tried such as the introduction of the human papilloma virus (HPV) test for primary screening of cervical cancer and, in the future, the use of artificial intelligence/machine learning, although the results of the latter so far are not persuasive.

Fourth, some things could be done better, for example by using a health systems approach such as that developed by the Eu-topia project (3). This project uses a systems approach to improve screening outcomes and has developed models and tools, such as a self-assessment tool to support countries. One example illustrated how to identify barriers to screening, while a second listed the following requirements for an effective screening programme:

- experts should evaluate the literature;
- there should be an ability to identify and invite the population at risk through a register;
- people should be given information in a format enabling them to make an informed decision as to whether they want to take up the offer of screening;
- a system should be in place to give people their results and follow them up;
- data from those screened should be linked to registry data;
- the implementation approach should take into account all the actors with interests in screening and who are in a position to support or inhibit implementation.

Finally, the presentation turned to the challenge of genomics and screening. Tests are offered to identify genetic risks even though there is no effective intervention, such as for Alzheimer's disease. Although it is unethical to screen in these circumstances, private companies make these tests widely available.

In summary, the principles of screening are well-established and, if they are applied rigorously, there will be few problems. However, there is tremendous pressure to ignore them and, given the huge profits to be made, steps need to be taken to prevent this happening.

Discussion

Many different terms are used in screening such as systematic, opportunistic, high risk or individual. These are poorly and inconsistently defined, an example being whether case-finding is the same as individual screening. This is a major problem. Further work is needed to reach a consensus on terminology and definition in this area.

In circumstances where the harms outweigh the benefits, there is often a move away from population to individual screening or case-finding. In addition, where health systems are publicly resourced and there are unmet needs, there are opportunity costs to individual screening and it is not justifiable to spend public money on ineffective interventions.

A comparison was made between the amount of research and programme development for cancer screening programmes as compared to non-cancerous conditions, an example being the screening of newborns.

Countries are often faced with pressures to divert limited resources to areas which are profitable for manufacturers. Addressing these issues requires difficult discussions.

Areas for further work and research identified included:

- improving health literacy for the population
- carrying out research for screening
- addressing the inequity that can occur in screening
- standardizing the measurement of harms and benefits.

Countries' experiences, opportunities, challenges and dilemmas in screening

In the interests of obtaining a sample of screening practices and programmes in Member States and to highlight the main issues they were facing, Member States were asked to answer the following questions.

- What are the main screening programmes for noncommunicable diseases (NCDs) and the life-course in place in their countries?
- What is the rationale for choosing these screening programmes?
- Which programmes work well? Which are considered most successful, and why?
- What are the main challenges faced in implementation?
- In which fields are more guidance and regional exchanges needed?

Belarus

The implementation of cancer screening is at an early stage. It is being revamped as part of a modernization of the health system and is part of the BELMED project which runs from 2016 to 2019.

A regional pilot project for breast cancer screening has been running and early results show that breast cancer cases in the project are apparently being picked up at an earlier stage than before screening was introduced. Other areas of work are the production of guidelines for colorectal, prostate and breast cancer screening and the introduction of data sets aligned with WHO's recommendations.

Challenges faced by the screening programmes include the use of paper-based records in the absence of computers to identify, invite and monitor individuals' attendance, and a lack of staff trained to carry out screening procedures.

France

Decision-making and programme evaluation is supported by the National Health Technology Agency, the National Public Health Agency and the National Cancer Institute. Two types of screening programme are being carried out. First, the screening of newborns includes blood spot for phenylketonuria (PKU), congenital hypothyroidism, sickle cell, congenital adrenal hyperplasia, cystic fibrosis (CF) and hearing. Medium-chain acyl-CoA dehydrogenase deficiency screening will be introduced in the coming year. Second, screening for colorectal, breast and cervical cancer is being implemented.

Cervical cancer screening is being moved from an opportunistic to an organized screening programme. It is currently cytology-based but a switch to HPV-based screening is foreseen, although this is a complex process.

Other screenings are recommended by national authorities and systematically offered but are not part of organized screening programmes. They include: ultra-sound for fetal anomaly; Down syndrome; congenital hip dysplasia; 20 childhood health checks; primary school screening for vision, hearing, growth and development and oral health; adult health checks for hypertension and urine dipstick.

The criteria for the introduction of new screening programmes cover evidence, acceptability, cost and feasibility. In addition, economic modelling is used to explore cost-effectiveness. Challenges experienced in implementing screening included: low participation in colorectal cancer screening; co-existence of opportunistic breast cancer screening which is reimbursed by insurance; lack of information for parents to make informed decisions about screening for rare diseases; introduction of new technologies with incomplete evidence and ongoing research; how to reach underserved populations; and evaluation of real-life effectiveness.

More support would be welcomed from WHO in a number of areas, including more guidance on how to promote informed choice and how to produce aids to decision-making. An international reflection on how to involve citizens in decisions about whether to introduce, continue or stop screening (examining people's trade-offs between the benefits and harms, including their preferences) would be of great value.

Germany

Screening is offered through the statutory health insurance scheme and there are legal regulations for health checks, early detection and organized screening programmes. The details of these screenings are specified in directives of the Federal Joint Committee and are often adopted by private insurance schemes.

Decision-making occurs through a consultation process which uses evidence-based scientific reviews as the rationale. The consultation process starts with an independent scientific report. A wide range of stakeholders, including patients' representatives and manufacturers, is invited to contribute to the consultation, although there is sometimes a need to compromise with key stakeholders on some of the parameters of the programme in order to make progress. The advantage of this kind of approach is that it can lead to better compliance from physicians and the public.

Screening in Germany follows the life-course. Newborns are screened for metabolic and endocrine conditions, hearing, hip dysplasia and congenital heart defects. In the first six years of life, children receive 10 examinations plus a further examination at age 12–14 years. Adults are offered one examination between 18 and 35 years and health checks every three years thereafter. From the age of 65 years men are offered a single screen for abdominal aortic aneurysms (AAA). At present there are consultations for screening for depression and hepatitis B and C.

The breast screening programme was the best organized of the programmes, as it was set up according to European Union (EU) guidelines and is offered to all women regardless of their insurance status.

Cervical screening is offered yearly. The programme has been revised in recent years and from 2020 women aged 35 years and up will be offered screening for HPV and cytology every three years. Younger women can continue to have an annual cytology screen. Such frequent screening is not evidenced-based but the demand came from the population and some physicians. It was a

reasonable compromise for the transitional phase of the programme but there is a need to improve health literacy in the population to address these kinds of issue.

The bowel cancer screening programme has also been revised. From mid-2019, insured persons from the age of 50 years will be invited for screening and will be able to choose between an immunological faecal occult blood test and a colonoscopy. The revised programmes will be evaluated.

Opportunistic screening that is carried out includes skin cancer screening and digital rectal examination for prostate cancer. Current consultations are on prostate-specific antigen testing and lung cancer screening.

Some of the challenges faced in Germany are because it is a large country with a decentralized health care system, and data protection laws restrict access to monitoring and evaluation data.

Input from WHO would help to facilitate the exchange and sharing of good practice between countries. In addition, reports and papers covering the basic principles of screening, harms and overdiagnosis would be welcome for use with policy-makers and the public.

Republic of Moldova

Cancer screening programmes for breast, cervical and colorectal cancer have been organized and the changing epidemiology of these cancers since the introduction of these programmes has been reviewed. While there appears to be a slight increase in cases presenting at an earlier stage in breast cancer, this is not consistent across colorectal or cervical screening.

A range of health sector policy documents has supported the introduction of screening, including the National Strategy for Prevention and Control of Noncommunicable Diseases 2012–2020 and the National Programme on Cancer Control 2016–2025.

The main challenges faced in implementation include a lack of financial resources, difficulty in moving from opportunistic to organized screening, the provision of suitable information for the public and inadequate quality control of the test.

Romania

Screening for newborns is offered for metabolic diseases (including PKU), chronic diarrhoea and malabsorption and hearing. However, since the change to the health system, the maternity services are not able to provide prompt support to children diagnosed with PKU.

Cervical screening has been offered since 2012. Its introduction followed a political announcement which had not been anticipated and the consequent lack of planning or financial allocation hampered implementation. The approach has improved, and pilots are now running for breast and colorectal screening.

A National Cancer Screening Committee is to be established with the role of producing guidance, guidelines for pilots and monitoring and evaluation protocols. It is hard to implement evidence-based guidelines when professional associations are keen to introduce screening which is not supported by the evidence.

Challenges to implementation included political influence on decision-making, a lack of ownership and political support for programmes (including a budget and resources), vested

interests on the part of manufactures and the pharmaceutical sector, difficulty in reaching vulnerable populations and a lack of engagement by the primary care sector.

The country would benefit if WHO were to develop international and European guidelines which would facilitate the sharing of good practice across Member States and the provision of support from international experts to de-intensify screening.

Slovenia

Screening is available free of charge through compulsory health insurance.

Cervical cancer screening started as an opportunistic screening programme in 1960. A review in 1997 showed that there had not been a reduction in incidence and the decision was taken to move to an organized programme with a computerized system, guidelines and quality control. By 2003 the whole country was covered by the programme. In 2017, an evaluation showed uptake of 70% and more than 50% reduction in incidence of cervical cancer. There are now plans to move to primary screening for HPV.

Colorectal screening has been offered every two years since 2008 to people aged 50–74 years using the fecal immunochemical test. Participation has reached 60%, although 10% fewer men than women participate in the programme. There has been a fall in the number of people presenting with invasive disease.

Breast cancer screening was also introduced in 2008. Women are invited for screening every two years and the participation rate is now 70%. As yet, no significant reduction in mortality has been detected but there has been a shift in women found with earlier stage disease.

Health checks are offered from birth at the primary health care (PHC) level for expectant mothers, newborns, pre-school children and school-age children. These checks include height, weight, development, speech and language, hearing and vision.

Cardiovascular health checks are provided for the whole population aged 30–70 years. They include checks for cardiovascular disease (CVD), chronic obstructive pulmonary diseases, diabetes mellitus, high lipids, depression, prostate-specific antigen and risk factors such as smoking, alcohol and diet. People with identified risk factors are provided with a variety of preventive measures in community health care centres.

The representative from Slovenia said that they would welcome WHO input in a number of areas such as technical advice to support upgrades to programmes, scientific evidence to support decision-making for programmes for adolescents whose needs are changing, and strategies to improve access and uptake for vulnerable groups.

Discussion

The following wide-ranging discussion included topics such as implementation research with questions on the measurement of cost-effectiveness as part of an evaluation of a pilot programme, definition and terminology (the difference between regular examinations and screening) and evidence (whether screening for AAA is justified when smoking rates have changed).

Policy-makers wanting to make changes to programmes face practical issues. For example, while health checks for children can be extensive and the benefits unclear, they are difficult to stop. In

addition, because data are often inadequate, it is difficult to properly evaluate them. Since health checks are often not considered as screening programmes, the usual rigour of operating them (such as found in cancer screening programmes) often does not apply. A further challenge faced by several countries is how to manage vested interests among a wide range of stakeholders such as professional associations, politicians and the public. Even in countries with strong governance, there are still unorganized programmes.

Participants suggested several ways in which decision-making and implementation could be supported, including strong governance structures, the exchange and sharing of good practice, international guidance, pilot projects, and documents covering basic principles and concepts. Support for evaluation is needed in small countries which do not necessarily have their own experts in-country.

Screening for specific conditions and life stages

This session allowed participants to review poster presentations covering several topics. Key points from each poster are summarized below.

Antenatal screening practices: preliminary results from a mixed methods study

This poster and the supporting background paper No. 8 presented the results of a survey of antenatal care (ANC), including antenatal screening, in the European Region. Responses had been received from 25 countries, capturing information on 19 ANC activities recommended by WHO or the United Kingdom National Institute for Health and Care Excellence (NICE). These were routine antenatal checks for the mother (weight, anaemia, asymptomatic bacteriuria, intimate partner violence, gestational diabetes mellitus, blood pressure and urinalysis), infectious diseases (HIV, syphilis, tuberculosis, hepatitis B virus, rubella and chlamydia), and detection of conditions in the fetus (fetal growth, ultrasound before 24 weeks, fetal echocardiography, blood group and Rh D, atypical red-cell alloantibodies, haemoglobinopathies and Down syndrome). The survey also collected information on 14 ANC activities not recommended by WHO or NICE.

Most countries (88%) surveyed have official national guidelines, although only 56% of the guidelines have been updated and are comprehensive. All countries used other guidelines as well as official national guidelines. The implementation of WHO or NICE-recommended ANC is suboptimal, with only one recommendation (ultrasound before 24 weeks) implemented in all countries.

Screening for newborns for metabolic and endocrine disorders

A review of screening programmes for newborns in the European Region for metabolic and endocrine disorders had shown that the number of disorders screened for varies from 0 to 40. Moreover, there is a high variation in screening coverage, cut-off values and regulations on reporting.

Although the utility of screening newborns for metabolic and endocrine disorders is proven, as it can save lives and prevent disability, there are no WHO recommendations for screening of newborns for disease and no policy recommendations or direct oversight at the European level.

There is a need for regulations at country level for treatment, reporting, follow-up, a panel to review screening and better screening coverage. In addition, support and guidance for stakeholders could help to reduce inequality in screening and increase the quality of life of children in the European Region. European standards would help to ensure the high quality of screening programmes.

Screening newborns for metabolic and endocrine disorders in Germany

The national screening programme for newborns in Germany has existed since 2005. This screening is regulated by mandatory guidelines for all the federal states in Germany. Screening samples are distributed among 11 laboratories. From 2006 to 2016, a total of 7 645 204 newborns were screened, giving a coverage rate of 99.9%. Recall rates are low, indicating high quality test procedures and analytical assays.

The growing number of conditions that could be screened for is a key issue for screening programmes for newborns. Before each new target disease is introduced there needs to be critical proof of benefit versus harm. New programmes require continuous monitoring.

Screening the hearing of newborns in the European Region

A review of practices relating to screening for hearing in newborns across the European Region had shown that data were not available for the entire Region. Universal screening for newborns' hearing takes place in 33 countries, but coverage is highly variable. Policy support for such screening varies from strong recommendations or legislation to no statement.

Moreover, there is a lack of standardization of protocols and of benchmarks. Only 17 countries are known to have standardized protocols used by all hospitals or centres and eight countries to have benchmarks and quality indicators.

Parents' experience with positive screening results for CF in newborns in Bavaria

A questionnaire given to 192 families about their perception of the CF screening process in Bavaria and the quality of communication after a positive screening result had been completed by 105 (54.7%) families. After being told about positive screening results, 86.4% of the parents were deeply concerned or worried. However, families who were informed about the positive screening results by a CF specialist (28.6%) were more satisfied with the information (80.0% versus 50.0% informed by staff on the maternity ward). The questionnaire also found that 77.7% of the families felt that waiting more than three days between receiving the information about the screening result and the diagnostic testing was too long.

Mental health and suicide screening in adolescents

The poster and supporting background paper No. 4 presented the results of a systematic review of the literature regarding mental health screening and suicide screening among adolescents.

All studies focused on high-income countries. There was inconclusive evidence to support the effectiveness of mental health screening. A review of two systematic reviews published in 2016 and 2018 which looked at suicide screening among adolescents found that screening programmes were not effective in reducing suicide ideation and suicide attempts among adolescents.

Challenges to providing effective screening programmes included a lack of tools with optimal psychometric properties, a lack of national policies for mental health, limited mental health services, a lack of professional skills, a lack of systematic referral pathways and sociocultural factors.

The poster concluded that there is an evidence gap for universal mental health screening especially, in the Region where only limited evidence is available. It recommended that more research should be conducted before recommending or not recommending mental health screening. Based on the literature reviewed, the paper does not recommend screening for suicide.

Screening for depression, alcohol use disorders and dementia

The poster and background paper No. 5 presented the results of systematic literature searches on screening and guidelines for three conditions from professional and governmental organizations in Europe and North America, covering 126 papers that had been retrieved and included in the review.

Several effective screening tools are available for *depression*. Currently, the evidence for depression screening programmes is not very strong. Some guidelines recommend routine screening for depression in primary care, but most do not.

Several well-validated screening tools exist for *alcohol use disorders*. Screening is recommended in most general medical settings and primary care. The net benefit of screening and brief behavioural counselling interventions for unhealthy alcohol use in adults is statistically significant but with moderate effects.

There are many instruments to screen for *dementia* but they are typically used for case identification and not for systematic screening. Screening for dementia or mild cognitive impairment is not recommended in guidelines. There is insufficient evidence to assess the benefits and harms of screening and early intervention for dementia.

Adult health checks/screening for cardiovascular risk

The poster and background paper No. 6 presented results of a review of practice in the Region and evidence for screening for CVD risk scores, atrial fibrillation (AF) and AAA screening. Nineteen countries in Europe conduct CVD risk or health checks, one or two countries appear to operate systematic screening for AF and two to three countries appear to operate AAA screening programmes according to the preliminary results of a situation analysis.

Health checks for CVD risk do not reduce the burden of CVD in society. There is, however, some evidence that systematic screening for CVD using risk scores may slightly reduce CVD risk factor levels and increase the use of preventive medication, although there are documented side effects of screening for CVD risk from overdiagnosis and overtreatment. The effects of commonly used risk score programmes have not been properly tested in randomized control trials.

Evidence for screening for AF is sparse. The results of a randomized control trial in Sweden on screening for AF and stroke are awaited. Currently, no randomized trials show that screening for AF reduces the incidence of stroke.

A Cochrane review in 2007 concluded that screening men aged 65 years reduced AAA-specific mortality by 40%. However, the systematic screening for AAA is challenged by the declining prevalence of AAA (due to a reduction in smoking) and less traumatic treatment challenges.

WHO does not recommend organized screening for CVD, AF or AAA. Opportunistic screening for CVD is recommended.

Computed tomography in asymptomatic people for screening

The poster presented a summary of evidence about the use of computed tomography (CT) and implications for imaging asymptomatic people for individual health assessments (IHA). CT is used in asymptomatic people for coronary artery calcium scoring, investigation of coronary artery plaques, early detection of lung and colon cancers and whole-body surveys.

CT-IHA practices are performed outside organized population screening programmes and the evidence of a net benefit is usually weak or absent. Quality assurance programmes are not always in place and these tests are often performed outside the health care pathway with no arrangements for transferring the results into the health care system.

Potential harms associated with CT-IHA may be related with the radiation-induced cancer risk, direct and indirect costs, overdiagnosis, overtreatment, false positives, false negatives, indeterminate and incidental findings and ethical dilemmas.

Screening for cancer

The poster and background paper No. 7 provided a high-level synthesis of evidence and practice for cancer screening programmes. There is sometimes a gap between the quality of the evidence to support cancer screening and subsequent recommendations and practice. This leads to uncertainty about the optimum method to screen for most types of cancer.

WHO recommendations support countries considering screening for cervical, colorectal and breast cancer. However, WHO does not recommend screening for other types of cancer such as prostate, thyroid, oesophageal, gastric, liver, lung and various gynaecological cancers.

Screening for cervical cancer is effective. The introduction of HPV vaccination may, however, affect its future cost-effectiveness and warrants a re-evaluation of how and who should be offered cervical screening in the future. Controversy continues over breast cancer screening; in some countries it is being introduced or expanded while being discouraged or de-implemented in others. The introduction of colorectal cancer screening is widespread globally, yet uncertainty remains about the optimum screening methods and the balance between its benefits and harms.

Many authorities discourage screening for prostate and thyroid cancer. Lung cancer screening is controversial, advocated by some and discouraged by others. Screening for oesophageal, gastric and liver cancer as well as various gynaecological cancers has a poor evidence base.

In conclusion, screening for cancer entails a balance between benefits, harms, costs and ethical implications for both society and individuals.

Screening for specific conditions and through the life-course: general principles, cross-cutting issues and country perspectives

Participants came together in groups to look at screening for specific conditions and through the life-course. They were asked to answer three questions.

- Why is screening not done when there is evidence to do it?
- Why is screening done when there is no evidence?
- What are the opportunities for changing screening practice?

Findings from each group were brought together into cross-cutting themes.

Why is screening not done when there is evidence to do it?

The following four themes were identified in answer to this question, with examples.

- The first theme was *barriers to translating evidence into policy*. Examples of this include: unclear or inconsistent communication from academics to policy-makers; powerful industry players with stronger voices than academics; lack of trust in agencies that produce guidelines and recommendations; limited role of professional societies in decision-making; impossibility of adapting international recommendations to local realities; absence of political will.
- The second theme was the *health system and policy context*. Examples include: cultural barriers when screening for some conditions (such as alcohol abuse); limited health literacy on the part of the public; barriers from professional societies; legal frameworks that do not support screening; a lack of understanding of principles of screening among health professionals.
- The third theme was the *lack of resources*, such as a lack of financial resources and trained personnel for all parts of screening pathway.
- The fourth theme was *weak organization and planning*. Examples included: an absence of implementation tools; ineffective dissemination of guidelines to key professionals; and a lack of processes to check that guidelines have been implemented.

Why is screening done when there is no evidence?

Similar themes were identified in response to this question.

- The first theme was that *available evidence has limitations but there is a belief among policy-makers and clinicians that screening does work*. An example of where this occurs is when there is an absence of evidence or lack of good quality evidence from randomized control trials. Sometimes it happens if custom and practice have become entrenched, and where there is unpublished data that has not been made available to researchers.
- The second theme was the *health system and policy context*. Examples of this included the influence of industry, commercial pressures to screen and the inability to control screening by private health providers (even if it is ineffective/harmful). Patient groups can influence policy-makers or politicians because of the desire to “do something” even when it is not evidence-based (especially where there are conditions with high mortality). There can be a failure to engage professional societies in decision-making, and the lack of a legal

framework could mean that clinicians felt exposed and pressured to test because of fear of litigation.

- The third theme was the *lack of education or understanding of screening*. Examples included: limited health literacy among the general population which leads to a demand for screening; limited scientific facilities or academics with experience in reviewing evidence to support decision-making; and inadequate education of specialists and decision-makers.

Participants discussed whether regulation could be used to address some of these issues and, if so, whether regulation it would be better to target the practitioner or the test.

What are the opportunities for changing screening practice?

Suggestions for *improving the quality of evidence* included producing summaries of evidence for academia and policy-makers, sharing best practice in evidence-based guidelines, undertaking local research to make it relevant to local health system and context, and using appropriate research from other countries through international collaboration and evidence-based recommendations for modern technologies.

Suggestions for *engaging with politicians, policy-makers and professionals* included strengthening the role of professional societies in decision-making, improving communication between different ministries (such as health and finance) and highlighting to policy-makers the need for sustainable financing.

Suggestions for *improving communication and strengthening the understanding of screening* included improving health literacy in the population, improving understanding of screening among health service providers and improving communication between experts or academia and policy-makers.

Suggestions for the further *development of guidance* included producing international guidance on 'how to produce guidance' and increasing stakeholder involvement and buy-in for the development of guidance.

Suggestions for *improving the organization and planning of implementation* included improving the training of specialists, improving quality control or quality assurance, ensuring adequate diagnosis and treatment capacity to receive screening positives, and ensuring a legal framework that supports the objectives of screening.

Health systems approach to screening

Participants discussed the health systems factors influencing screening decisions and practice and considered what a comprehensive and aligned health system response to screening would look like. Lastly, the session considered how risk literacy among health workers can affect how risk is communicated to the public.

Organizing screening programmes

This presentation considered the steps that should be considered in implementing a screening programme. Further detail is provided in background paper No. 2.

Assess the situation, justification and governance

The first step is to undertake a situational analysis to inform policy-makers whether the suggested screening programme is the most cost-effective public health strategy to solve the public health problem of concern. For example, have primary preventive strategies already been effectively implemented and the core components of early diagnosis and high-quality treatment of symptomatic people been optimized?

This should be followed by a review to check that the screening programme meets the country's criteria for screening, and that implementing the screening programme is justified.

Lastly, a governance system should be set up which clearly states the roles and responsibilities of staff involved so as to provide oversight for the implementation of the programme.

Pilot-testing and goal-setting

Pilot-testing is essential before the roll-out of screening starts. These are time-limited projects to test the feasibility, resource implications and optimal delivery of a large-scale screening programme. The pilot should be run in a setting that is representative of the average national conditions in which the large-scale screening programme will function and be delivered by personnel who are available in the country.

An important step in establishing screening programmes is to set goals and objectives so that there are clear expectations for the programme. Objective goal-setting can use the format of criteria and standards to measure the structure, process and outcomes from the programme.

Describing the pathway and the system

Screening is a pathway of interconnected steps which must be clearly described before screening can start. The pathway outlines the potential outcomes for the participant in screening. Each country's health system is unique, and the pathway should describe how screening-positive people are referred to diagnostic and treatment services.

The pathway should be supported by a system with guidance documents and protocols to explain how individuals who are screened move along the pathway, how the test is conducted and the quality standards expected of the system.

The pathway also drives the requirements for data to support quality assurance, ongoing optimization of the screening programme, and monitoring and evaluation of the programme.

Scaling up and re-evaluation

Having established the screening pathway, guidance and protocols, data sets, and governance and quality assurance systems, it is then possible to scale up the programme. It is common practice to use pilot projects to start the roll-out of screening.

At the outset of roll-out it is important to set time frames for re-evaluation of the programme with agreed objectives and data sets. A national team should manage the roll-out and make sure it is progressing according to plan. At times it will be important to modify or slow down roll-out if new information comes to light that indicates the need for a change in approach.

Re-evaluation may also be triggered because of a change in either the condition (such as prevalence or epidemiology) or technology to screen, or a change in the treatment for the

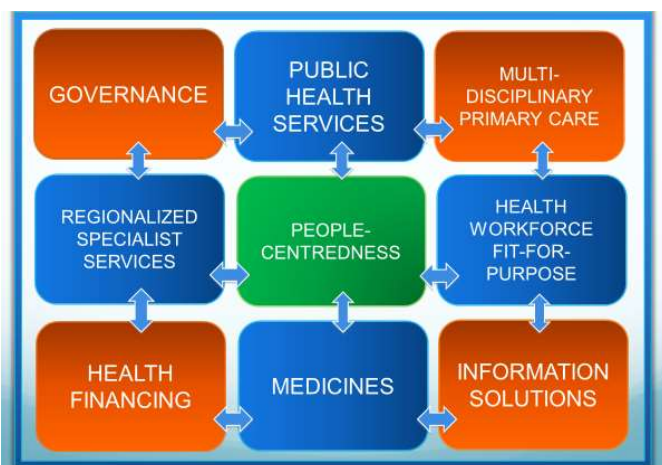
condition. All these factors may alter the ratio between benefits, harms, costs and the ethical implications of screening. Re-evaluation promotes a re-appraisal of screening to ensure that it continues to be the most cost-effective approach to address a public health problem. Outcomes from a re-evaluation can be to continue the current screening programme, modify it, de-intensify it or de-implement it.

Applying a comprehensive and aligned health systems approach to screening

This presentation and background paper No. 3 reviewed why a comprehensive and aligned health system approach to screening is required. The approach was illustrated using the example of cervical screening.

The nine cornerstones of a health system response were illustrated in Fig. 1.

Fig. 1. Nine cornerstones of a health system response



Each cornerstone was discussed and its importance illustrated.

- Strengthened *governance* ensures coherent policy frameworks and sustainable intersectoral action, connecting national, regional and local levels.
- Well-resourced *public health services* lead health promotion and disease prevention activities with a focus on equity.
- *Multidisciplinary primary health care* proactively manages health and wellbeing.
- Adequately *regionalized services* provide prompt care for acute conditions.
- *People-centredness* should be reflected in all health system functions.
- A *fit-for-purpose health workforce* delivers people-centred interventions and services based on evidence.
- Adequate and prioritized *health financing* ensures that coverage of important services and incentives are aligned with health service delivery goals.
- Access to *quality medicines* is ensured through reliance on comprehensive coverage, pricing policies and promotion of generics.

- *Information solutions* serve population health management and coordination across providers for seamless care and self-management.

However, for there to be a greater impact on health, a comprehensive multipronged approach is required together with a strengthening of different health system functions. If there are missing pieces, progress will be hampered. In addition, even if the health system has been comprehensively developed, its various functions may be misaligned, preventing an impact on outcomes.

Participants raised two issues that picked up on the practicalities of achieving the goal of a comprehensive and aligned health system for screening: the need to prioritize resources and actions in a resource-limited environment, and the challenge of tackling low uptake. Appropriate measures might include strengthening primary care and considering strategies such as outreach. Information technology also offered the opportunity to stratify risk groups and target interventions so as to increase uptake more effectively. This kind of approach could be strengthened through accountability frameworks to increase uptake. There are, however, risks associated with aggressive promotion of uptake if there are not the diagnostic and treatment services to receive referrals.

Discussion

The Eu-topia project applies a health systems approach to improve the effectiveness of screening, using modelling to look at the impact of different screening scenarios and examining barriers to implementation. Modelling does, however, have limitations, for example in cases of overdiagnosis where modelling tended to underestimate the effect. Models need to be verified with empirical data.

Participants commented on the tension that could occur between a desire to increase uptake and the importance of respecting the autonomy of the individual to decide whether to be screened.

Lastly, participants expressed their concern that PHC physicians are central to many screening programmes: as new programmes are introduced they are put under increasing pressure with no additional resources. The PHC sector needs additional support to deliver on new screening interventions while continuing in its essential role.

The influence on screening recommendations and counselling behaviour of medical risk literacy among physicians

This presentation was dedicated to the question of how physicians' understanding of medical statistics and risk influences their evaluation of the benefits and harms of screening and subsequently their counselling behaviour. Evidence shows that only a few physicians can deal correctly with screening statistics. The consequence of this lack of medical risk literacy is that physicians considerably overestimate the benefits associated with screening and underestimate the related harms.

It appears that many doctors lack medical risk literacy is because they do not understand how to use and interpret statistics. Few physicians, for example, know that the five-year survival statistic is an invalid metric due to lead time and overdiagnosis bias. It is, however, commonly used to promote the benefits of screening because it often looms larger than does the valid metric of mortality rates.

Many physicians also struggle to calculate the positive predictive value (PPV) of a test, which is needed to explain to a patient the likelihood that he or she will have the disease screened for, given a positive screening result. This again is a question of how medical risk information is presented to physicians. If given all the relevant information in the form of a natural frequency tree, most physicians can understand and calculate the PPV themselves.

It is, therefore, important that transparent statistics are used in official statements, research papers and health care information, and that medical training includes risk literacy. Key steps that can be taken is the use of absolute risk instead of relative risk, natural frequency trees for illustrating PPV and not using survival rates in the context of screening.

Implementation and de-implementation of screening programmes

This final session considered country perspectives on organized screening programmes, factors for success and examples of starting and stopping screening and how the political economy influences decision-making.

Albania

Albania has a National Programme for Prevention and Control of NCDs (2016–2020).

In 2015, the country initiated an innovative PHC programme called Si je? (How are you?) for all citizens aged 40–65 years. As part of the programme, all Albanians in this age group can receive a free annual basic health examination at their local health centres. At the end of 2016, this age group was expanded to 35–70 years in order to reach the target size population. The programme is based on a computerized case-based registry managed by the Ministry of Health and Social Protection.

In 2016, there was evidence of a high proportion of persons with unidentified problems being picked up at the check-up. However, there are challenges, such as that participation is lower among men than women. Since the introduction of the programme there have been some significant changes in the population's behaviour, including a change in traditional attitudes (for example, that the health system should only be used for perceived and disturbing health problems) and better utilization of PHC services. It appears that the programme has led to improved trust and communication between health professionals and the community and better monitoring of risk factors associated with chronic disease.

There is a challenge with cervical cancer, which is the second most common cancer among women with most cases diagnosed at stages III and IV. The cervical screening programme has had very low uptake due to budgetary constraints and insufficient training of medical personnel. As a result, a cervical cancer screening programme based on an HPV test will be launched in 2019. The test will be free and self-administered. The HPV tests will be interpreted in a central laboratory to minimize the cost, and PHC personnel will be trained to ensure the quality of the test. A sustainable culture of chronic disease prevention is thus being built in the PHC system.

EU Innovative Partnership for Action Against Cancer and the Finnish experience

The Innovative Partnership for Action Against Cancer was launched in 2018, co-funded by the EU. Work package 5 is on early detection, screening and prevention and is being led by Finland.

Finland's approach is to adapt programmes based on research. Good-quality data have been collected since 1953 in the cancer registry and this work has been supported by researchers.

Since the introduction of the cervical screening programme in the 1960s there has been a significant reduction in both incidence and mortality due to cervical cancer. Currently the standardized age-adjusted incidence rate is four and mortality rate one per 100 000 woman-years compared to an incidence rate of 16 and mortality rate of seven per 100 000 woman-years before screening. As evidence emerges, there is a continuing need to modify the programme by, for example, changing the intervals between screening.

Russian Federation

In 2013, the *dispensarization* programme was modified and now includes health checks for blood pressure, risk factors and cancer. Of the people screened, 30% are sent for further investigations. Those who have abnormal screens for cancer are sent to specialist centres, those with high blood pressure are managed in PHC using agreed protocols and those with risk factors are followed up in healthy living centres.

Following an evaluation of the programme, certain changes have been made in the way it is run. The population is now paid for one day away from work to encourage them to attend for the check-up. Some of the tests which are not evidence-based (such as urine analysis) have been dropped, although not without difficulty. Both the public and politicians voiced concerns, but eventually experts were able to convince them of the changes.

The increase in health checks has, however, placed a considerable burden on PHC physicians. An attempt was made to shift this work into another area but this led to difficulties in communicating results to patients. In addition, diagnostic tests in different places led to poorer uptake.

Spain

Spain has universal coverage and free access to health care in a decentralized health care system with 17 regions.

The country has adapted the Wilson & Jungner principles and produced 18 criteria to judge whether to screen for a condition. Systematic antenatal screening programmes have been established as well as screening of newborns for metabolic, endocrine and hearing disorders. There are also systematic screening programmes for cervical, breast and colorectal cancer.

In addition, opportunistic programmes have been developed in PHC. These include the healthy child programme, screening for risk factors for NCD such as smoking, alcohol, physical activity or diet and for frailty for people at 70 years.

The governance and process for decision-making includes the approach to de-implementation of a programme. Although there is such a process, it remains difficult to reach a decision. A major

factor is the number of different stakeholders with interests in the decision so that ultimately decisions have been political.

Priority is given to integrating equity into all activities (4). The *Spanish methodological guide to integrate equity into health strategies, programmes and activities* has been used to make changes in the way screening is offered. It includes an example from one region (the Basque Country) on how to integrate equity in colorectal cancer screening. The WHO global guide to improve equity, developed by WHO based on the Chilean approach, has also taken into account the Spanish experience.

United Nations Children's Organization Regional Office for Eastern Europe and Central Asia

The Eastern Europe and Central Asia Region of the United Nations Children's Organization (UNICEF) is facing one of the highest rates of suicide in the world. An initiative undertaken in one country to address suicide and self-harm among adolescents, which had been promoted by international experts and supported by UNICEF, had included a component of school-based screening for suicide using a validated tool.

The school-based suicide prevention programme had been successful in raising awareness and increasing open dialogue about mental health among adolescents, teachers and parents. The screening component had, however, been less successful: participation by adolescents during the first year had been 100% but dropped significantly in the second year. It appeared that the adolescents had quickly learnt that answering the screening questionnaire could lead to them being summoned to the office of the school psychologist to discuss their mental health, something they did not necessarily want to do and which deterred them from participating.

Many countries in the Eastern Europe and Central Asia Region conduct health screening programmes as part of routine school check-ups. At times, however, there is a lack of understanding of how these programmes can be conducted in a way that ensures the consent, privacy and confidentiality of all those participating. For example, schools in some of these countries screen girls for their sexual health, but reports show that it is precisely those girls who are sexually active and could benefit most from these programmes who decide to skip school during such screening for fear of breaches in confidentiality.

There is concern that screening might be perceived as a method of social control and thus generate a lot of negative feeling in the population. Examples of this are when screening is required to check if a person is fit for a job or university, as a mechanism for authorities to avoid blame if someone falls ill, or in order to obtain a certificate (such as for marriage, work or migration, or attesting to being drug- or HIV-free).

There are numerous human rights and/or social exclusion and stigma issues potentially linked to screening. In many countries, screening for mental health or drug or alcohol abuse may lead to serious sanctions and stigmatization if a person is found to have a problem (for example, loss of job or housing, or a record resulting in ineligibility to get a driving licence or be admitted to university).

This negative perception of screening, where it is seen as an approach designed to check and control the population rather than link them to care, may deter individuals from seeking help and break down trust between the population and care providers. Lastly, this kind of screening

approach can be disempowering for the population, who feel that they do not have agency over their own health.

Lessons could be learnt from the example of how HIV testing programmes are successfully carried out, especially among the most vulnerable and socially excluded populations. Important factors for success are: involvement of the target population in the design, development and roll-out of these programmes; outreach; creation of trust between health care providers and the population; confidentiality of results; linkage of those testing positive to care; and, above all, respect and dignity for every individual.

Discussion

The following discussion again picked up on the impact of screening on PHC. There was a danger that screening could be offered as an alternative approach to good family doctors. Screening needed to be provided in the context of a broader set of initiatives to improve health and should not be seen as a panacea for health care.

Conclusions and next steps

The WHO European Region would use the output from this Consultation to develop scientific publications and briefs for policy-makers. In addition, there is a plan for a conference during the next twelve months for 53 countries to launch this new area of work. WHO hopes to continue to work with countries on this important topic in 2020/2021.

A summary of findings from the Meeting focused on 13 cross-cutting issues that had emerged during the meeting, associated challenges and areas for development or further support from WHO.

Suggestions from country representatives for further input from WHO covered several areas including: ‘how to products’ for pilot projects and evaluation; advice on data sets and quality indicators; recommendations on whether to screen as well as recommendations on what not to screen for; and advocacy at a country level with senior policy-makers.

WHO programme managers described ongoing work in their areas and where they felt further work should be undertaken. All these points are captured in Table 1.

Table 1. Summary of cross-cutting issues, challenges and recommendations for further work

Cross-cutting issue	Challenges and issues	Further work
Definitions and terminology	<p>Terms such as case-finding, health checks, ‘dispensarization’, screens, are imprecisely defined.</p> <p>Types of programme are often contrasted and are poorly defined:</p> <ul style="list-style-type: none"> • organized versus unsystematic • population versus individual • opportunistic screening versus case-finding • screening programmes versus screening activities • high risk versus average risk. 	<p>Definitions should be provided for all terms frequently used in the context of screening.</p> <p>A typology should be produced which includes the characteristics of different types of screening and the implications of a decision to call something a type of screening programme or screening test.</p>

Cross-cutting issue	Challenges and issues	Further work
	<p>Failure to define terms undermines a health systems analysis to understand the impact of different approaches.</p>	
Wilson & Jungner principles	<p>Wilson & Jungner's principles still hold but do not cover aspects of screening such as overdiagnosis.</p> <p>The principles should be turned into country-specific criteria that can be used to guide policy-makers.</p>	<p>Wilson & Jungner's principles and practices of screening should be updated.</p> <p>Countries should be supported in producing country-specific criteria.</p>
Harms, benefits and costs	<p>Benefits of screening are frequently overestimated and harms underestimated in research literature and policy documents.</p> <p>To date, research has found it difficult to identify and quantify harms, in particular overdiagnosis.</p> <p>When making decisions regarding whether to screen, a country's preferences and values are often not explicitly considered or analysed as part of the harms/benefit ratio.</p>	<p>A framework for balancing harms, benefits and costs should be developed to support policy-makers.</p> <p>A methodology should be developed to measure harms and overdiagnosis so that they can be compared to benefits.</p> <p>Further work should be undertaken to explore whether it is possible to incorporate preferences and values into the framework.</p>
Use of evidence	<p>It is often hard to communicate evidence of harms, benefits and overdiagnosis clearly so that it is understood by the public and stakeholders. The result is that science is often not linked to policy.</p> <p>There is a tendency not to thoroughly implement interventions that are known to work before moving on to other interventions with weak evidence and/or are not cost-effective. This can lead to diverting focus away from WHO priorities.</p> <p>There is a danger that decision-making is driven by 'emotional epidemiology' rather than evidence-based practice.</p> <p>At times, professional guidelines are not aligned with other evidence-based guidelines.</p> <p>It is often not possible to generalize international research to a country's health system. This requires local research and generation of evidence specific to the local context.</p>	<p>Further work should be undertaken to determine what guidance would enable countries to use evidence effectively.</p> <p>Countries should be supported in carrying out local research to support evidence-based practice that is relevant to their health economy.</p>
Emerging technologies	<p>Emerging technologies such as machine learning provide opportunities to do things better but they need to be evaluated in practice.</p> <p>Genomics is a rapidly developing field but recommendations on what to do with the results of genetic screening are not keeping up with the rate of availability of commercial genetic screens.</p> <p>There are considerable commercial and professional pressures to screen using new technologies.</p>	<p>Work should be done to support academic institutions in responding and advising rapidly on emerging technologies based on best evidence.</p>

Cross-cutting issue	Challenges and issues	Further work
Ethics and equity	<p>Several ethical perspectives can influence decision-making but these are often not made explicit and understood by policy-makers.</p> <p>Screening can lead to increased inequalities as it tends to be used by the wealthy well.</p> <p>Uptake remains low for many cancer screening programmes; however, caution is needed because in striving to increase uptake, quality can decline.</p> <p>There continues to be difficulty in reaching underserved populations.</p> <p>Gender and human rights are often not considered when screening programmes are designed.</p>	<p>Consider including explicit ethical considerations in future publications on principles and practice of screening.</p> <p>Further work should be undertaken to support countries in addressing inequalities and gender and human rights issues in screening.</p>
Cancer screening versus non-cancer screening	<p>There is a long history of health checks through the life-course in many countries but they have often not been recognized as part of the family of screening and have been under-evaluated.</p> <p>The principles of organized screening have often not been applied to antenatal and newborn screening and adult health checks in the same way as cancer screening programmes. This has resulted in a lack of rigour both in organization and quality assurance (QA) and a failure to collect data for evaluation.</p> <p>There are challenges in screening for conditions such as depression and alcohol abuse because of stigmatization.</p>	<p>Consideration should be given to whether WHO should produce guides on how to run screening programmes for antenatal and newborn screening and adult health checks.</p> <p>Further work should be undertaken to support the collection of better data for non-cancer that covers the pathway.</p>
Managing stakeholders: politicians, industry, patients	<p>Policy-makers can be pressured to introduce new screening programmes by industry. This may be exacerbated if they win support from politicians.</p> <p>Professional groups may want to use new technology even though it may not be cost-effective to do so.</p> <p>The public may feel there is a need to do something regardless of the quality of the evidence.</p> <p>Compromise may be needed to move forward.</p>	<p>Consideration should be given to what support WHO can provide to experts and policy-makers to manage pressures from a range of stakeholders.</p> <p>Access should be provided to international guidance, recommendations and toolkits.</p> <p>The sharing of best practice should be facilitated.</p>
Health systems	<p>Weak governance or inadequate structures inhibit effective policy-making.</p> <p>Legal and regulatory frameworks can both support and inhibit effective implementation of screening programmes.</p> <p>The use of modelling is increasingly helpful to test different options for implementation, although at times empirical research is needed to validate findings.</p> <p>De-implementation and de-intensifying of screening programmes remain difficult and strongly influenced by the political economy.</p> <p>It is not always possible to generalize information on financing and how to measure cost-effectiveness to different health economies.</p>	<p>Consideration should be given to further implementation research on the role of health systems in the implementation of screening programmes.</p> <p>Consideration should be given as to the steps WHO can take to assist experts in the use of evidence-based science when supporting politicians in making hard decisions. This could include guidance on what not to do.</p> <p>A review should be carried out of tools for countries on how to spend money more wisely.</p>

Cross-cutting issue	Challenges and issues	Further work
	<p>The impact of screening and health checks on the PHC workload is underestimated. It may also lead to de-skilling staff.</p>	
<p>Implementation, QA, monitoring and evaluation</p>	<p>It is difficult to shift from unsystematic or opportunistic screening to organized screening. It is preferable to set up an organized programme from scratch.</p> <p>Pilots are a very important stage before full implementation, but there is a lack of clarity on how to run and evaluate them. They can be perceived as inequitable.</p> <p>There is a lack of understanding of the importance of quality control and QA in ensuring that screening programmes maximize benefits and minimize harms.</p> <p>Screening programmes find it difficult to collect and use data for QA and monitoring and evaluation.</p>	<p>Guidance and support should be provided on how to run and evaluate pilots and monitor and evaluate programmes.</p> <p>Consideration should be given to providing further support and guidance in developing and implementing quality control and QA for screening programmes.</p> <p>Guidance should be provided on the appropriate use of quality standards, indicators and monitoring data.</p>
<p>Person-centred care</p>	<p>There is inadequate information for the population to make informed decisions on whether to participate in screening.</p> <p>There can be tension between increasing uptake versus supporting the autonomy of participants to decide whether to go for screening.</p> <p>Screening can be perceived negatively as a means of social control in some settings. To counteract this, providers must make sure screening is provided confidentially, and there must be trust between participants and providers.</p> <p>There is a danger of dissociation of screening from other public health interventions such as child and adolescent care.</p>	<p>Consideration should be given to developing a measure of participation as well as uptake or coverage.</p> <p>Thought should be given to steps that can be taken to build public trust in screening providers.</p> <p>Consideration should be given to ways to offer screening as part of an integrated public health strategy.</p> <p>HIV and TB programmes can provide lessons in building trust in the population and reaching vulnerable groups. Consideration should be given as to whether this learning can be applied to screening.</p>
<p>Communication and health literacy</p>	<p>There is a lack of understanding in the health professions of basic statistics of screening and what they mean.</p> <p>There is often limited health literacy in the public which impairs their ability to make informed choices regarding screening.</p>	<p>Consideration should be given to steps that would improve risk literacy for professionals and health literacy for the public.</p>

Closure of the Meeting

Jill Farrington thanked participants for their hard work and contributions to the Consultation, which she felt was extremely productive. The comments received will be taken into account when planning future work in this area. In particular, she thanked speakers, panellists, and the authors of posters and papers. The meeting was then closed.

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Annex 1

LIST OF BACKGROUND PAPERS

No. 1	Medical screening: key concepts for policy-makers	Brodersen, John; Martiny, Frederik
No. 2	Organizing screening programmes	Brodersen, John; Martiny, Frederik
No. 3	A comprehensive and aligned health system response to screening	Borgermans, Liesbeth
No. 4	Mental health and suicide screening in adolescents	Petros, Nuhamin Gebrewold; Carli, Vladimir
No. 5	Screening for depression, alcohol use disorders and dementia: an overview	Cuijpers, Pim
No. 6	Adult health checks/screening for cardiovascular risk in the WHO European Region	Jørgensen, Torben
No. 7	Screening for cancer	Brodersen, John; Martiny, Frederik
No. 8	Antenatal screening practices in the WHO European Region: preliminary findings from a mixed methods study	Lazzerini, Marzia; Armocida, Benedetta; Piccoli, Monica

Annex 2

PROGRAMME

26 February

Plenary 1. Opening and introduction

Chairperson/Moderator: *Bente Mikkelsen, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe, Copenhagen*

Welcome and opening

Bente Mikkelsen

Introduction to the programme and expected outcomes

Jill Farrington, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe, Copenhagen

Keynote. Screening in NCDs and through the life-course: definition, scope, principles, cross-cutting issues, benefits and harms

John Brodersen, Centre for Research and Education in General Practice, University of Copenhagen

Respondent: *André Ilbawi, Management of Noncommunicable diseases, Cluster of Noncommunicable Diseases and Mental Health, WHO, Geneva*

Keynote. Screening: what is on the horizon?

Martin McKee, European Centre on Health of Societies in Transition, London School of Hygiene and Tropical Medicine

Discussion

Plenary 2. Country perspectives

Chairperson: *Jill Farrington*

Panel of Member States: Opportunities, challenges and dilemmas in screening

Aliaksandr Verbavikou, Ministry of Health, Belarus

Françoise Hamers, Santé Publique France, France

Petra Uschold, National Association of Statutory Health Insurance Funds, Germany

Rodica Scutelnic, Ministry of Health, Labour and Social Protection, Republic of Moldova

Carmen Ungurean, National Institute of Public Health, Romania

Blanka Mikl Mežnar, Ministry of Health, Slovenia

Discussion

Plenary 3. Screening for specific conditions and life stages – poster presentations

Chairperson/Moderator: *Martin Weber, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe, Copenhagen*

Poster presentations

- Screening for depression, alcohol use disorders and dementia
Pim Cuijpers, Faculty of Behavioural and Movement Sciences, Vrije University, Amsterdam
- Adult health checks/screening for cardiovascular risk
Torben Jørgensen, Centre for Clinical Research and Prevention, Bispebjerg and Frederiksberg Hospital, Copenhagen

- Screening for cancer
Frederik Martiny, Centre for Research and Education in General Practice, University of Copenhagen
- Computed tomography in asymptomatic people for screening
María del Rosario PEREZ, Department of Public Health, Environmental and Social Determinants of Health, Cluster of Family, Women's and Children's Health, WHO, Geneva
- Antenatal screening practices: preliminary results from a mixed methods study
Marzia Lazzarini, WHO Collaborating Centre for Maternal and Child Health, Instituto di Ricovero e Cura a Carattere Scientifico, Burlo Garofolo Trieste

Child and adolescent health screening:

- Mental health and suicide screening in adolescents
Nuhamin Petros, National Centre for Suicide Research and Prevention, Karolinska Institutet, Stockholm
- Metabolic screening in newborns in the European region
Pia Maier, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe, Copenhagen
- Hearing screening in newborns in the European Region
Pia Maier
- Newborn screening for metabolic and endocrine disorders in Germany
Uta Nennstiel, Bavarian Health and Food Safety Authority, Bayern, Germany
- Parents' experience with positive newborn screening results for cystic fibrosis
Inken Brockow, Bavarian Health and Food Safety Authority, Bayern, Germany

Group work. Discussion of specific screening considering general principles, cross-cutting issues and country perspectives

Introduction to group work

Session Moderator: *Nino Berdzuli, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe*

Group work

- Group A: Antenatal screening
Facilitator: *Nino Berdzuli, Division of Noncommunicable diseases and promoting health through the life-course, WHO Regional Office for Europe*
- Group B: Child and adolescent health screening
Facilitator: *Martin Weber, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe, Copenhagen*
- Group C: Cancer screening
Facilitator: *Marilys Corbex, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe, Copenhagen*
- Group D: Adult health checks/screening for cardiovascular risk
Facilitator: *Jill Farrington*
- Group E: Mental health screening
Facilitator: *Dan Chisholm, Division of Noncommunicable Diseases and Promoting Health through the Life-course, WHO Regional Office for Europe, Copenhagen*

27 February

Feedback from Day 1

Plenary 4. Health systems approach to screening

Chairperson/Moderator: *Dan Chisholm*

Introduction: Organizing screening programmes

Frederik Martiny

Keynote. Applying a comprehensive and aligned health systems approach to screening: what does it look like?

Liesbeth Borgermans, University of Ghent

Respondent: *Melitta Jakab, Division of Health Systems and Public Health, WHO Regional Office for Europe, Copenhagen*

Keynote. How does medical risk literacy of physicians influence screening recommendation and counselling behaviour?

*Odette Wegwarth, Max Planck Institute for Human Development, Center for Adaptive Rationality
Harding Center for Risk Literacy*

Discussion

Plenary 5. Implementation and de-implementation of screening programmes

Chairperson/Moderator: *Marilys Corbex*

Panel discussion

- Organized screening programmes: how to do it and factors for success
- Screening programmes: when, what and how to stop, start, continue

Alba Merdani, Public Health Institute, Albania

Russian Federation

Spain

Nina Ferencic, UNICEF Regional Office for Eastern Europe and Central Asia

Satu Lipponen, Joint Action Innovative Partnership for Action Against Cancer

Plenary 6. Conclusions and next steps

Chairperson/Moderator: *Jill Farrington*

Feedback from Rapporteur

Sue Cohen

Discussion

Conclusions and next steps

Annex 3

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