Diabetic retinopathy screening in the WHO European Region: plans for development, barriers and facilitators: A survey of professional associations and key informants Preliminary findings for consultation

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REGIONAL OFFICE FOR Europe

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Abstract

WHO recommends diabetic retinopathy (DR) screening for all people with diabetes and treatment for prevention of blindness as an effective intervention in tackling a major noncommunicable disease. The WHO Regional Office for Europe commissioned the University of Liverpool, United Kingdom, to produce a situational analysis of DR screening provision and capacity plans across Member States of the WHO European Region. The purpose of the situational analysis is to describe the current status, plans for development, and barriers and facilitators to progress of DR screening in the WHO European Region by seeking the perspectives of ophthalmology and endocrinology professional organizations in Member States. Information was collected using a survey tool. Respondents from 45 of the 53 Member States returned surveys. The findings are presented in two reports: the first, published in early 2021 by the WHO Regional Office for Europe, covered the current situation. This second report presents preliminary findings for consultation on plans for development, barriers and facilitators. The situational analysis demonstrates that there is much that countries in the WHO European Region can do to improve the effectiveness of DR screening. By acting, they may reduce the burden of vision impairment and blindness due to DR in their countries.

Disclaimer: these are preliminary findings, if you have comments, please contact us: euncd@who.int.

Design: Charlotte Allen.

Contents

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Acronyms

AI	artificial intelligence
DR	diabetic retinopathy
EU	European Union
HIC	high-income country(ies)/region(s)
MIC	middle-income (lower- or upper-middle-income) country(ies)
OCT	optical coherence tomography
UoL	University of Liverpool

Executive summary

WHO recommends diabetic retinopathy (DR) screening, alongside prompt treatment for those who need it, as an effective intervention for all people with diabetes to prevent vision impairment and blindness. DR nevertheless remains a leading cause of vision impairment and blindness across the WHO European Region, with an estimated 950 000 people affected.

The WHO Regional Office for Europe commissioned the University of Liverpool, United Kingdom, to carry out a situational analysis of DR screening in the 53 Member States of the WHO European Region. Of these, 33 are classified as high-income countries/regions and 20 are middle-income (lower- or upper-middle-income) countries, according to the World Bank lending group classification *(1).*

Views were sought from nominated national professional associations of ophthalmologists and diabetologists, allowing the perspectives of selected organizations and individuals, rather than those of the national or regional ministry of health, to be gauged.

A survey tool was designed to cover three main areas: organization of screening within a country/region, plans to develop screening in the future, and barriers and facilitators for achieving success. Responses were analysed using quantitative and qualitative techniques. An earlier report covers the findings from responses to the survey on the current situation in each country/region *(2).*

This publication reports on the findings from the second section of the survey, which focused on developing screening for the future and covered plans to develop DR screening programmes and barriers and facilitators. This section of the survey used open-ended questions, producing narratives that then were analysed using a qualitative thematic framework. The themes generated were grouped in the same way as the first report, which follows the framework used in the Regional Office publication *Diabetic retinopathy screening: a short guide. Increase effectiveness, maximize benefits and minimize harm (3).*

Respondents from 45 of the 53 Member States returned surveys. One Member State returned four surveys, one from each of its devolved administrations, so in total, 48 surveys were analysed. Of these, all but one respondent provided some information on the section of the survey on developing screening for the future.

Caution is needed in interpretation of narratives and how frequently a theme appears. Respondents did not have to answer all questions, and no guidance was provided on how much respondents were expected to write. The detail and quantity of responses may also have been influenced by respondents' level of proficiency in the English language.

Across all questions, respondents showed engagement with the agenda and a strong desire to develop effective DR screening programmes. Comments were thoughtful and insightful.

The main findings were as follows.

- The importance of systematic or organized screening programmes was a theme that emerged quite frequently. Respondents' ideal model for the future included a national programme with a central diabetes register, national guidelines and a consistent approach to grading. Lack of coordination and common guidelines and a fragmented system were mentioned by respondents as barriers to effective screening.

- The importance of training for the screening workforce was mentioned by some respondents. Respondents had different views on whether training should be just for ophthalmologists or could include other professional groups, such as nurses and technicians.

- When asked about their plans or ideal models, many respondents discussed the need for further equipment and new and updated technologies for both screening and treatment. Telemedicine, digital fundus photography and artificial-intelligence-based DR systems were the main themes identified.

- Although not expressed in terms of a pathway, a common theme highlighted by respondents was the importance of a system to enable patients to be identified and move through screening without being lost to the system. This was expressed through an emphasis on the importance of health information systems, diabetes registers, and invitation and referral mechanisms in any new model of screening.

- The importance of quality, a quality assurance system and monitoring and evaluation for a DR screening programme did not emerge as important themes. They were mentioned by only a few respondents whose countries already had well established screening programmes.

- Inequity and poor uptake were identified by some respondents as barriers to an effective DR screening programme. This was attributed to poor patient compliance, lack of awareness of DR screening and poor access in rural and remote locations.

- Many respondents identified a wide range of barriers related to health system leadership and governance. These included lack of strategic direction, legal and regulatory barriers to screening (such as sharing of personal data), managing the interface between private and public health care, and lack of leadership for DR.

- There was a notable discrepancy between the frequent mention of the themes of leadership and governance as barriers to successful implementation of a DR screening programme and their lack of inclusion in respondents' outlines of plans or ideal models. This may indicate that professional groups are less familiar with the importance of areas such as leadership and governance in developing a new programme and may be an important focus for policy-makers wishing to take forward DR screening.

- The role of stakeholder engagement involving, for example, professional specialties or associations and patient groups was cited as an important facilitator of success, but the focus on this theme might be due to a specific question asking about engagement.

The themes that emerged mapped easily to the framework in the DR screening short guide *(3)*, indicating that the framework is capturing most of the issues that clinicians and policy-makers face in establishing a new programme. It was also apparent that some parts of the framework featured much more than others in respondents' plans or ideal models. Equipment, staff and diabetes registers were cited frequently, but quality, equity in access and monitoring and evaluation were less prominent. The challenge for policy-makers will be to make sure that all aspects of the framework are addressed in their plans to develop a DR screening programme.

It is clear that many professionals who responded to this survey are enthusiastic about developing more systematic and comprehensive DR screening. These professionals, however, will need the support of policy-makers to address structural issues, such as national policies, regulations and funding mechanisms, if they are to be successful. They will also need to work with policy-makers to provide the national leadership to develop a DR screening pathway that addresses the fragmented and unorganized way in which screening currently is delivered in some countries.

The findings suggest professionals and policy-makers working together can create a coherent national strategy for DR screening and enable DR screening to be more systematic/organized, equitable and effective.

The WHO Regional Office for Europe's DR screening short guide publication *(3)* provides guidance of how to develop a more systematic and pathway-led DR screening programme. Without professionals and policy-makers taking a lead together in driving forward this more systematic approach, however, more people with diabetes in the European Region may experience vision impairment and blindness unnecessarily.

References

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This is a working document; you can contribute to it by submitting your insights to euncd@who.int

Introduction

WHO recommends diabetic retinopathy (DR) screening for all people with diabetes and treatment for prevention of blindness as an effective intervention in tackling a major noncommunicable disease *(1)*.

The WHO Regional Office for Europe has developed operational advice for screening and has produced a short guide for policy-makers on screening for various conditions throughout the life-course *(2)*. Building on this general guide, *Diabetic retinopathy screening: a short guide. Increase effectiveness, maximize benefits and minimize harm* was published in November 2020 for policy-makers, public health leaders and senior clinicians *(3)*. The guide describes how to improve the effectiveness of DR screening by moving from an unorganized to a more systematic screening approach using the principles of screening as described by Wilson & Jungner *(4)* and applying a pathway approach.

The WHO Regional Office for Europe commissioned the University of Liverpool (UoL), United Kingdom, to produce a situational analysis of DR screening provision and capacity plans across Member States of the WHO European Region. The UoL team previously had been involved in surveys of DR screening conducted under the auspices of a European-wide interest group first established in 2005 *(5)*.

The purpose of the situational analysis is to describe the current status, countries'/regions' plans for further developments and the barriers and facilitators for implementation of DR screening in the WHO European Region. For the purposes of this report, facilitators are defined as factors that support implementation. The analysis was undertaken by seeking the perspectives of ophthalmology and endocrinology professional organizations in Member States. It is designed to identify trends and particular approaches to DR screening that may be helpful in informing policy-makers, senior clinicians, public health leaders, professional and patient associations, and other stakeholders involved in planning, designing and implementing DR screening.

This is the second report of the findings from the survey. The first documented the current situation of DR screening *(6)*: this second report covers responses that describe plans for development of DR screening and barriers and facilitators to progress.

Methodology

The survey was designed to be completed by respondents from professional associations from each Member State of the WHO European Region.

Information for the situational analysis was collected using a survey tool. Additional demographic data were obtained from the WHO Regional Office for Europe European Health Information Gateway *(7)*.

The survey instrument was developed by UoL in collaboration with WHO and is based on previous surveys undertaken by the UoL team *(5)*. Questions were designed to cover three main areas: organization of screening within a country/region, plans to develop screening, and barriers and facilitators for achieving success. Respondents were also asked to provide copies of relevant screening policies, clinical guidelines and patient information leaflets. This report focuses on findings from the survey for the two main areas; plans to develop screening, and barriers and facilitators for achieving success. These where elucidated from the final section of the survey on developing screening in the future.

A list of professional organizations for ophthalmology and diabetes in each country/region was drawn up. A letter was sent by the research team to the professional organizations where these could be identified. Each organization was asked to nominate an ophthalmologist and a diabetologist to complete the survey instrument. Where no professional organizations could be identified, the Regional Office contacted the WHO country offices and/or ministries of health to identify the most appropriate person to respond to the survey.

Responses therefore largely reflect the perspectives of nominated organizations/individuals rather than national/regional ministries of health. The survey tool and responses were in English.

The section of the survey on developing screening in the future used open-ended questions, so respondents were able to provide as much or as little detail as they wished. All text was extracted for questions under the section and then assigned major and subthemes independently by two of the team. Themes were compared and differences discussed until consensus was reached. Narratives were analysed using a qualitative thematic framework.

Countries were grouped according to gross national income World Bank criteria *(8)* and recognized political groupings (such as membership of the European Union (EU)) to identify any trends among country responses.

The situational analysis questionnaire is shown in Annex 1, classification of Member States in Annex 2, and participating countries and respondents in Annex 3.

Results

Response to survey

There are 53 Member States in WHO European Region. Respondents from professional associations of 43 Member States returned a completed survey questionnaire. The survey was returned by the ministry of health for two countries (Turkmenistan and Uzbekistan). Eight Member States' professional associations or ministries of health (Belarus, Estonia, France, Iceland, Kazakhstan, Monaco, North Macedonia and Romania) either did not respond to requests or said they could not complete the survey.

The United Kingdom submitted four surveys, one from each of the four devolved administrations: England, Northern Ireland, Scotland and Wales.

Responses therefore were received from 45 Member States, with 48 surveys analysed.

Of the 45 Member States that submitted surveys:

- 29 are high-income countries/regions (HIC) and 16 are classified as middle-income (lower- or upper-middle-income) countries (MIC);
- 14 were members of the EU before 2004 and are considered as part of the EU15 group, 11 joined after 2004 and are categorized as the EU13 group (see Annex 2);
- nine belong to the Commonwealth of Independent States grouping; and
- five are members of the South-eastern Europe Health Network.

One respondent (from Turkmenistan) who returned the survey did not answer any of the questions in the section of the survey on developing plans for the future. Consequently, 47 surveys were analysed for this report.

General observations and limitations on survey responses

There was considerable variation in the way respondents completed the survey. Some provided additional detail and supporting documents, while others gave short responses. In some cases, the survey was completed by more than one person, with different perspectives or answers being provided. This was noted where relevant.

Some survey respondents indicated they could only respond for their hospital or region and could not provide information for the whole country. In these circumstances, this limitation was noted.

Some respondents left questions blank. It was not possible to know whether they did so because they could not answer, did not know the information requested, or had missed the question(s) out. For the purposes of the narrative analysis, themes were assigned only to responses, and gaps/blanks were not reported.

The questionnaire was circulated in English only and required responses in English or Russian. Two submissions were translated from Russian, and all others were in English. It was recognized that this was a limitation, as respondents' understanding of the question or their ability to express detail in English may have affected whether they answered some questions.

[1] The United Kingdom was not a member of the EU at the time of the survey (2020) but had been a member of the EU before 2004, so is considered as part of the EU15 group for the purposes of this report.

General comments on responses

Of the 47 surveys that provided information on the section on developing screening for the future, some provided information on all three areas of plans, barriers and facilitators. Others provided information only in some areas. Two respondents (from Turkey and Ukraine) did not provide specific information on ideal models or plans for the future and five (from Belgium, the Russian Federation, San Marino, Switzerland and the United Kingdom (Scotland)) did not provide any information on barriers to implementation. Thirty respondents provided information on facilitators.

Main findings and interpretation of results

Results for this report are presented in two parts. First, results are presented for the overall response according to the three main types of questions: plans for DR screening, barriers and facilitators.

Second, the themes are presented aligned to the framework used in the DR screening short guide *(3)* (see Table 1). Results are presented under each element of the framework according to plans, barriers and facilitators.

Table 1. Alignment of themes to the framework

Framework and subtopics	Themes covered in the narrative
Screening programme design: systematic versus unorganized programme	Screening programme is systematically organized or not (opportunistic) Has/has not got national/regional guidelines protocols and pathway (In)Consistent/(un)coordinated approach across specialties Fragmented versus centrally/regionally organized
Screening programme design: screening intervals	Use of annual, variable or risk-based screening intervals
Resources and infrastructure	Workforce capacity and training Equipment for screening, assessment and treatment New technology
Pathway	Identification of cohort, diabetic register, invitation, call–recall, referral of patients for assessment and treatment, health information systems and electronic patient records
Quality	Use of quality standards, quality assessment and audit and steps to raise quality (excluding training and education – covered under workforce)
Equity	(In)Equity in access, uptake coverage and health literacy, including patient compliance, patient awareness
Operational infrastructure: leadership and governance	Leadership, strategic direction, legal/regulatory, stakeholder engagement, health system organization including public/private working
Operational infrastructure: finance	Funding and methods of funding screening and treatment
Monitoring and evaluation	Programme monitoring and evaluation (includes registers of visual impairment)

Where appropriate, frequency of themes is reported using the following nomenclature: few (< 15%), some (16–49%), many (50–69%) and most (70–100%). Verbatim text has been used to illustrate themes but is not attributed to any country/region.

Plans for development

Respondents were asked about their plans for the development of DR screening services. Two questions addressed this topic, each with a slightly different emphasis: “What would be the ideal model for screening for diabetic retinopathy suitable for your country/regional context?”; and “What are the principal requirements you need to develop your ideal national/regional screening programme?”

From the 45 respondents who provided information on this topic, 32 were from HIC and 13 from MIC. Respondents explained what they felt was relevant for their specific country/region; some described what was working well, others described plans for screening in their country/region, and others described what would be their ideal model of screening.

The amount of detail varied between respondents. Some discussed the topic in one sentence, while others set out their plans at length. At times, it was difficult to determine whether respondents’ responses represented realistic plans or simply aspirations for an ideal system for the future.

Barriers

Respondents were asked, “What do you consider are the barriers to implementation at present?”

Some respondents identified barriers when they answered other questions in this section; any text that highlighted barriers has been reported regardless of which question the respondent was answering.

Respondents from 42 countries/regions identified barriers to implementation of a DR screening programme. Of these, 14 were from MIC and 28 from HIC.

Facilitators

The survey drew out factors that could act as facilitators to developing effective DR screening through the questions “What are your tips for success?” and “How do you currently evaluate the success of your programme, if you have one?”

A third question, “What has been your experience of engaging with health providers (commissioners, health insurance companies, private and public sector) and patients so far?”, led to stakeholder engagement becoming a predominant theme for factors that acted as facilitators for many respondents (25/47). Some respondents reported that stakeholder engagement between governments and DR screening programmes was good, while others described positive stakeholder engagement in terms of health providers’ cooperation and public and patient engagement. These are explored in more detail below under the relevant topic.

Overall, 30/47 respondents reported on facilitators, compared to 42/47 reporting on barriers.

Themes aligned to the framework in the DR screening short guide

Screening programme design: systematic/organized versus unorganized programmes

Plans for development

Many respondents (17/30) mentioned the importance of developing a systematic national programme in their ideal model. One said, "[The] development of national screening guidelines and a national screening model, with fundus photography and automated grading [is an ideal model for screening]". Another reported on their success, saying "we have [the ideal model], one national retinopathy screening programme".

A respondent from an upper-middle-income country identified the importance of a national programme, saying "the only viable way of early detection of diabetic retinopathy is a large-scale population screening programme".

Barriers

Some surveys (14/42) identified themes of DR screening being unorganized or unsystematic as barriers to effective screening. Themes included lack of coordination across health services. One respondent referred to the "lack of coordination between the DR screening service running in the primary health-care setting and the unit at the main hospital in terms of referral guidance ...".

Organizational features were also identified, as illustrated by a respondent from a HIC who said, "approximately 80% of DR screening is decentralized and non-hospitalized; this is a potential barrier for optimization".

Some respondents said communication between ophthalmologists and endocrinologists/diabetologists was poor and that they do not use the same guidelines or protocols, making effective care difficult. One respondent said there was a "lack of a common language" between the specialties, while another talked of "no consistency in managing diabetic patients among ophthalmologists and endocrinologists".

An explanatory factor picked up by a few respondents was lack of awareness of the importance of DR screening among some professional groups. Lack of clinical engagement did not appear to be linked to a country's/region's income level. A respondent from a HIC remarked that there was a "lack of awareness [of DR screening] in decision-makers, administrators and health-care operators (mostly [general practitioners] but not excluding ophthalmologists and diabetologists)".

Facilitators

Taking a systematic approach was mentioned only by a few respondents (4/30) as a tip for success. This was in the context of a well established screening programme, as identified by a respondent from a HIC who said "[to be successful, a country] requires a unified national approach with central funding, audit, standard setting and quality assurance".

Screening programme design: screening intervals

A few respondents (7/45), all from HIC with established programmes, discussed plans for risk-based DR screening using personalized screening intervals. Moving to risk-based intervals appeared to be the next step in developing their programme, as illustrated by one respondent who referred to "full implementation of individualized screening intervals as given by national guidelines (i.e. longer screening intervals for low-risk patients)"

Resources and infrastructure: workforce

Plans for development

Training more staff to be involved in DR screening programmes was a theme identified by some respondents (14/45) in their plans. Among these, many (8/14) discussed only training ophthalmologists for grading. One respondent from a MIC explained, "Training of qualified ophthalmologists to diagnose and treat DR is needed". Another said, "For success, it is necessary to train specialists". Others, however, considered training for general practitioners, nurses and technicians: one respondent said, "[We should] educate nurses and technicians on fundus photography. The images would be graded by ophthalmologists – medical retina specialists working in the departments of ophthalmology …".

A respondent from a HIC remarked, "The number of ophthalmologists/population is sufficient, more technicians and administrators could make [screening] more effective". A similar view was expressed by another respondent, who said, "For an ideal national screening programme, training and re-training of ophthalmologists, nurses and technicians who will be able to perform screening throughout the country [is needed]".

Barriers

Some respondents (9/42) identified shortage of health workers as a barrier to implementation of DR screening. Of these, many (6/9) were from MIC. Respondents remarked on the shortage of specialists and a few commented that this was a particular problem in more remote areas; as one noted, "There is limited access to specialists for people living in small towns". The problem was not limited to specialists. A respondent claimed there was a "lack of educated nurses and technicians for fundus photography".

Training was also identified as an issue. A respondent from a MIC stated, "There is not enough trained retinal specialists for the early diagnosis of DR". Training was noted to be a factor in the lack of awareness among ophthalmologists of the importance of DR screening and the use of consistent guidelines.

Pay of staff was identified as a barrier; one respondent stated, "There are not enough health workers and they are not paid adequately".

Facilitators

The workforce was discussed by four respondents in the section on facilitators. One representative from an upper-middle-income country reported, "We have [a] good number of ophthalmologists … in all cities in [our country]". Another said, "Health providers are highly engaged", and one respondent revealed that, "We were working in several projects and quite successfully engaged health providers (including their education), there are [health-care practitioners] in various districts who are ready to be trained and be involved in future screening".

Resources and infrastructure: equipment and technology

Plans for development

Many respondents (23/45) discussed the need for further equipment and new and updated technologies for screening and treatment. Telemedicine, digital fundus photography and artificial-intelligence (AI)-based DR systems were the main themes identified from the surveys.

Some respondents (7/23), all of whom were in high-income settings, revealed that AI was in their plans for development. One respondent stated, "[A] risk-stratified model with AI pre-grading the images in addition to the current model [would be an ideal model of screening]". Another recommended "implementing AI-based screening", while one suggested "telemedicine or AI in [general practitioner's] office and decision-making by trained and experienced ophthalmologists". A respondent from a low-income setting discussed a range of factors that would be needed to develop a suitable DR screening model for their country, saying, "Ideally, linking online monitoring, supported by the government, and telemedicine with the consultations provided by colleagues from abroad [would be ideal]".

Telemedicine was recommended by some respondents (8/23). The most common equipment discussed by respondents was digital fundus photography (n = 10) and optical coherence tomography (OCT) (n = 5). As explained by one respondent from a HIC, "telemedicine would be ideal with fundus photography and/or OCT". Another said, "The introduction of tele-ophthalmology, which would bridge the gap between our primary and secondary health care systems, [would be ideal]".

Barriers

Lack of suitable equipment for DR screening was identified as a barrier by some respondents (11/42). A respondent from a MIC remarked that they needed a wide range of equipment, including slit-lamp biomicroscopes, and hoped for new technology to alleviate their problems: "There is a need for fundus cameras and slit lamps at the [national centre] (at a minimum) for ophthalmologists' use. This will allow documentation of treatment results. A special mobile phone attachment would be highly beneficial for ophthalmologists working with DR for diagnosis and evaluation of treatment results".

Lack of OCT and lasers for treatment were also identified by a few respondents.

A few respondents commented that telemedicine, AI or machine learning may offer solutions to their problems, but that currently none of these options had been deployed. One respondent from a HIC said, "At present, the increasing number of diabetic patients is a challenge. However, there are technical possibilities i.e. machine learning, to tackle this".

Facilitators

Only three respondents discussed equipment or technology as a facilitator or an important factor in their success. One respondent from an upper-middle-income country did not appear to have any problems with access to technologies, stating, "We have a good number … of OCT, [fundus fluorescein angiography] and other technologies in all cities in [our country]". One from a HIC stated, '[Our] biggest achievement [is the] reimbursement of [anti-vascular endothelial growth factor treatment]", and another that "Digital imaging, multiple access points for patients and an infrastructure to transfer records and images within each region [are available in our country]".

Pathway

Although the word pathway was not mentioned explicitly by respondents, frequent references were made to the importance of a health information system and the transfer of data along the steps in the pathway, including identification of the cohort using diabetic registers, invitations, testing and referral for treatment.

Plans for development

Some respondents (23/45) highlighted the need for robust information systems. Among these, most (18/22) mentioned that diabetes registers/electronic patient databases were needed to develop and manage successful DR screening programmes. One respondent stated, “Strong ownership of the data in a centralized register would be best for the sake of health data quality”. Another stated, “The ideal model for screening would be informative record of patients with an automatic patient call–recall system, developed with the help of the government and national health care”.

Another respondent from an upper-middle-income country said, “The creation of an electronic database with archiving of retina photos should be the next stage in the development of care for patients with DR in [our country]. This will expand the possibilities for assessing patient data over time, including for the purpose of correspondence consultations, remote monitoring and communications to assess the effectiveness of treatment”.

Two respondents discussed plans to develop robust platforms for exchanging data and fundus images. One said, “Adaption of existing image sending systems [is important]”, while the other remarked, “It is extremely important to establish logistics between specialists for the regular and rapid exchange of data, which will allow an integrated approach to the treatment, diagnosis and prevention of diabetes mellitus and its complications, including DR”.

A few surveys (n = 6) specifically mentioned electronic patient records as an important component of their plans, as illustrated by this respondent: “As there is a centralized computerized [electronic medical record] system, the ideal model would be integration of screening in the software allowing all patients with a diagnosis of diabetes to be called for screening/examination by an ophthalmologist. The software at this stage does not have this capability”.

Barriers

Some respondents (12/42) mentioned inadequate health information systems as a barrier to progress in DR screening programmes. Many of these (10/12) specifically commented on the lack of a diabetes register. One respondent from a HIC picked up that resistance to collection of personal data may play a factor in establishing a register, commenting, “The main problems have been a complete lack of registers as well as their incompleteness (and an almost inborn resistance to being registered)”.

Difficulties with e-records and electronic data transfer were also picked up as issues preventing effective screening. A respondent from a HIC noted that “Lack of clinical data flow across general practitioners and ophthalmologist is a current barrier”.

Facilitators

Respondents from eight of 30 countries/regions offered facilitating pathways of care as a tip for success. One from a MIC said an important factor in their success was the recent development of an electronic health system: “The system e-health has started its work, which should help to improve the situation with establishment of patients with [diabetes] and their register”. Similarly, another respondent said, “We are in the process of making our own register for DR”.

One respondent commented on the importance of use of a standard protocol or algorithm by saying, “The key message is including the standard algorithm of annual ophthalmologist examination for [diabetes] patients in routine clinical practice in [our country], that let us make a success”.

Quality

Quality was not a common theme across the survey. Ten respondents mentioned quality or audits in questions in the final section of the survey, nine of whom were from HIC with well established screening programmes.

Eight respondents mentioned quality standards, quality assurance or audits as important factors in the success of their programme, with one noting, "We have external quality assurance visits every three years to all programmes".

Equity

Plans for development

Some respondents (13/45) stated that their plans included improving uptake and/or addressing inequalities. One said, "[We] need to reduce the rate of non-attendance by better education and surveillance of people with diabetes", while another noted, "The next step is to expand the coverage of the population with high-quality screening and treatment of patients".

A respondent commented that the only way to address inequity in access and poor uptake was a population screening programme: "In our country, the majority of patients with diabetes mellitus do not adhere to DR therapy and preventive measures. Reasons include patient lack of knowledge and interest, shortage of community ophthalmologists, geographical remoteness, or lack of available appropriate equipment for the diagnosis of DR. Therefore, currently the only viable way of early detection of diabetic retinopathy is a large-scale population screening programme".

Barriers

Some respondents (17/42) identified issues around inequity in access or poor uptake as barriers to success.

A few countries/regions (HIC and MIC) picked up the issue of inequalities in access to services in rural and remote settings or areas outside the capital. A respondent remarked, "Huge discrepancies in access to care between rural and urban areas make it impossible for many patients to reach adequate and timely DR treatment".

Patient compliance was reflected in some responses, linked to, for example, health literacy, with a few respondents mentioning patients' lack of awareness of DR and its complications. A respondent from a HIC commented, "There is lack of information to patients as we see many neglected cases that present very late with complications of advanced [proliferative diabetic retinopathy]. Patients would present earlier if they were aware of the need and benefits of screening".

Lack of awareness did not appear to be the only problem. A respondent from a HIC with an effective invitation system noted that "patients who are not compliant are usually those with severe mental illness, significant comorbidities or dementia, and those with low socioeconomic status and low health literacy".

Facilitators

Some respondents (9/30) provided examples of factors that have led to success in addressing poor uptake. One said, "[There is] easy and free access to health-care facilities", while another commented, "[Our insurance system] has been providing the funding and has therefore enabled wide access to all the insured people with diabetes. The people with diabetes attending the screening programme trust the programme and are happy to attend".

A few respondents identified their experience of raising patient awareness of the risk of DR. One from a HIC highlighted the importance of using personal stories as a way of engaging with people with diabetes through "positive cooperation with patients having lost vision, telling their stories to the media, simultaneously exposing the Achilles heel of opportunistic screening: making a personal history universal".

Operational infrastructure: leadership and governance

Plans for development

Some respondents (12/45) discussed the importance of leadership and governance in their plans.

One respondent from a HIC noted the importance of leadership, saying, "Health programmes are welcomed by authorities … organizations need enthusiasm". Another identified the potential role of legal or regulatory steps in successfully implementing a programme, noting that there is a need to "apply sanctions for non-compliant patients and doctors".

Respondents illustrated the importance of central government in developing DR screening. One, for instance, noted that "The ideal model for screening would be an informative record of patients with an automatic patient call–recall system, developed with the help of the government and national health care". Another remarked that "The role of the ministry of health, institute of public health and health fund is fundamental for improving coverage of DR screening".

Barriers

Many respondents (25/42) made references to issues that fall under the heading of leadership and governance. Some (5/25) commented that there was no national strategy or national plan to address DR screening or diabetes: for example, "There is a lack of overall strategic direction to the whole diabetes care system and this impacts on screening as well".

Some others identified legal or regulatory barriers to progressing DR screening. These had an impact in different ways. In some cases, they affected the ability of screening programmes to access or share patient data, with one respondent commenting, "Access to individual health-care data is limited due to regulatory agencies, which impede efficient interdisciplinary disease management". Another remarked that "Telemedicine would be ideal with fundus photography and/or OCT, but the legal system of our country does not accept this type of examination".

The role of government in overseeing the interface of private and public medicine in DR screening emerged as a theme for a few respondents. One from a HIC commented on the role of opticians, saying, "Today, opticians as a group have, through heavy marketing, convinced many diabetes customers … that they alone can handle the diabetic patient and the screening challenge without involvement from ophthalmologists. … This is interpreted as being biased 100% by commercial interest. However, the availability and quantity of opticians outnumbers ophthalmologists in [our country]".

Another remarked that they have "a very extensive private sector of ophthalmic care, and the public sector is underfunded and poorly coordinated".

Other issues mentioned included lack of leadership for DR screening. A respondent from a MIC noted that the barrier is "no national society and no chairperson for diabetic retinopathy". A few respondents from HIC commented on the difficulty in progressing developments because of lack of coordination, leadership and direction. "It is often difficult to coordinate actions with the health ministry, the social security board and the public hospital leading staff simultaneously," said one.

Barriers due to health system structures were identified by a few respondents, including the commissioning models for purchasing health care in some countries/regions being slow to change or acting as a barrier to better-quality services. One respondent, for example, noted that "commissioning is slow to change and accept new ideas".

Facilitators

Many respondents (21/30) mentioned good engagement between their governments and health-care providers, but it is important to note that this was in response to the specific question on stakeholder engagement.

These respondents described what was working well for their country/region in terms of engagement between health-care professionals and patients. One from a HIC stated, "Health providers are highly engaged and most patients are also high engaged", while another remarked, "[Our country] has made great progress, especially in communication among diabetologists and ophthalmologists". A respondent from an upper-middle-income country said, "We were working on several projects and have quite successfully engaged health providers (including their education)".

Only two of these respondents with well established programmes picked up other leadership or governance factors for success. The first highlighted the importance of sustained public health leadership and the use of evidence by saying, "Tackle negativity head on with evidence, data and explanations. You will be challenged with all the reasons why screening will not work in your country, but the principles are the same". The other picked up the use of performance monitoring led by the ministry of health: "The whole medical system, including the ministry of health, [provider] managers and medical staff in all primary care clinics, have high awareness of the importance of screening. The percentage of diabetes patients who had a fundus exam is one of the quality markers on which every primary care clinic is judged by the [provider], and a quality marker of the [provider] as judged by the ministry of health".

Operational infrastructure: health financing

Plans for development

Although financing is an important aspect of DR screening programmes, few respondents (6/45) mentioned it as an issue.

One respondent, from a HIC, said, "We need cooperation and dialogue between diabetologists and ophthalmologists. With proper organization and funding, it is possible to create a national screening programme for diabetic retinopathy". Another stated, "[DR screening programmes] should be mandated by health authorities and supported financially [and] technically", while a respondent from an upper-middle-income country suggested that "The ideal model of the programme [would be a] national screening programme with active patient call. Increased funding (public and private health-care providers) … [is recommended]".

Barriers

Some respondents (16/42) specifically identified lack of funding or financing as an issue affecting progress in DR screening. It is notable that only some (6/14) of the respondents from MIC remarked specifically on lack of funding as a barrier to DR screening, with one saying, "The barrier is lack of money and resources". Lack of funding is not limited to MIC, as a respondent from a HIC remarked on "the fear of investment and extra cost/money (savings) rules, also at regional health levels".

Some (5/16) commented on issues with insurance systems. One respondent noted, "National health insurance funding is usually limited, segmented and distributed unevenly between providers and through the year. It creates obstacles for many insured patients to access systematic screening by retinal photography and OCT". Another from a HIC made a similar point, stating they had "no law and budget for active screening, [and] too low billing for existing consultations and procedures". One respondent expressed concern about how insurance companies' policies can affect treatments for DR: "The problem which remains is communication with the health insurance organization for the coverage of the [anti-vascular endothelial growth factor] treatment. Insurance companies have introduced very strict criteria for implementation of this treatment".

Facilitators

Few respondents (3/30), all from HIC, regarded their DR screening programme as being adequately funded. One explained that funding used to be a barrier that was overcome through good stakeholder engagement, while another declared that "investment of more than 140 million had been made in ophthalmic units over seven years". Another stated that "In general, the public health system is well developed [in our country] and most expenses are covered by health insurance".

Monitoring and evaluation

Although a question mentioned evaluation, it emerged as a theme only in a few surveys (n = 5), all of which were returned from HIC.

A few respondents commented on being unable to obtain data, or on the quality of the data available, which was also linked to the lack of registers. One, for example, stated, "The performance indicators and clinical benchmarks were agreed on a national basis. Due to the lack of a national database for the screening of diabetic retinopathy, we do not have exact data on the performance indicators nationwide as of yet".

One respondent described their experience of a blindness register and its importance in showing the success of the programme, stating, "Excellent work speaks for itself both on individual level and as seen in [our country's] register of visual impairment".

Another respondent from a HIC also mentioned that a blindness register should be available to monitor DR-related visual impairment and blindness and provide better patient outcomes for those with end-stage DR disease. The respondent recommended "Setting up a blindness register to evaluate the prevalence of visual impairment and blindness secondary to diabetes and assess the progression of retinopathy (from diagnosis to end-stage disease), thus gauging the efficacy of the local screening programme and ophthalmic services and offering the appropriate low-vision aid should end-stage disease ensue".

Discussion

The findings in this report echo many of those in the earlier report *(6),* which found that while most countries/regions have some sort of DR screening in place, it largely is unorganized/unsystematic and predominantly carried out by ophthalmologists, and that some countries/regions lack equipment for effective screening and treatment.

The findings in the earlier report, taken together with the thematic analysis of text in this report, provide policy-makers with important and significant insights into the challenges they face in moving DR screening in the WHO European Region to being more systematic, effective and capable of providing comprehensive cover for people with diabetes.

The written answers from the 47 respondents provided rich material for the thematic analysis. There was much commonality between respondents, with some issues repeatedly being raised.

Interpretation of the responses was challenging in some cases because the perspective of the respondent was unknown. For example, when respondents were asked about their tips for success or their ideal model, it was unclear if the responses reflected their opinion, actual experience or, in the case of the ideal model, realistic plans or an aspiration. Language and cultural barriers may also have contributed to misinterpretation of the survey questions. If another survey is undertaken, these issues should be addressed in the methodology.

The importance of systematic or organized screening programmes was a theme that emerged frequently. Lack of coordination, no common guidelines and a fragmented system was mentioned by respondents as barriers to effective screening. Not surprisingly, some respondents expressed their desire for a more systematic and organized approach to screening in their model for the future, including a national programme with a central diabetes register, national guidelines and a consistent approach to grading.

The importance of training for the screening workforce was mentioned by some respondents, but different views were expressed on whether training should be just for ophthalmologists or could include other professional groups, such as nurses. Professional and regulatory barriers to using other occupational groups may play a part in these decisions, and use of other occupational groups for screening may seem less relevant in countries/regions with a large ophthalmology workforce.

When asked about their plans or ideal models, many respondents discussed the need for further equipment and new and updated technologies for both screening and treatment. Telemedicine, digital fundus photography and AI-based DR systems were the main themes identified from the surveys. Risk-based screening intervals was also mentioned by some respondents (from HIC).

Although not expressed in terms of a pathway, the importance of a system to enable patients to be identified and move through screening without being lost to the system was a common theme. This highlights the importance of health information systems, diabetes registers, and invitation and referral mechanisms in any new model of screening. Policy-makers may find the concept of a pathway useful for addressing issues related to health information systems and crossing organizational divides, and in establishing more effective screening programmes.

The importance of quality, a quality-assurance system or monitoring and evaluation for a DR screening programme did not emerge as an important theme. The few mentions it received came from respondents from HIC with well established screening programmes that had been in place for some years. Raising the significance

of building quality into a screening programme at an early stage is an important task for policy-makers who are establishing new screening programmes.

Inequity and poor uptake were identified by some respondents as barriers to an effective DR screening programme. This was attributed to poor patient compliance, lack of awareness of DR screening and poor access in rural and remote locations. Addressing issues of poor access to screening or improving health literacy did not, however, come up as frequently as would be expected in respondents' plans for development, given the number of citations they received in responses to barriers to success. Respondents may have felt that other issues needed to be addressed before they could focus on poor coverage.

Many respondents identified a wide range of barriers related to health system leadership and governance, including lack of strategic direction, legal and regulatory barriers to screening (on issues such as sharing of personal data), managing the interface between private and public health care, and lack of leadership for DR. There was a notable discrepancy, however, between the frequent mention of these themes as barriers to successful implementation of a DR screening programme and their lack of inclusion in respondents' outlines of plans or ideal models. This may indicate that professional groups are less familiar with the importance of areas such as leadership and governance in developing a new programme and may be an important focus for policy-makers wishing to take forward DR screening.

The role of stakeholder engagement as part of leadership and governance was identified as an important theme, possibly due to a specific question asking about engagement. It may also point to an important tool for policy-makers in taking DR screening forward.

The themes that emerged mapped easily to the framework in the DR screening short guide *(3),* indicating that the framework captures most of the issues clinicians and policy-makers face in establishing a new programme. Some parts of the framework featured much more than others in plans or ideal models. Equipment, staff and diabetes registers were frequently cited, but quality, monitoring and evaluation, equity in access and broader aspects of leadership and governance were less prominent. The challenge for policy-makers will be to make sure that all aspects of the framework are addressed in their plans to develop an effective DR screening programme.

Conclusion

The findings of the survey of professional associations captured in this and the earlier report on the current situation *(6)* highlight that while DR screening is recognized as an important public health intervention to reduce vision impairment and blindness, many countries/regions across the WHO European Region are yet to implement an effective and comprehensive programme.

Many professionals who responded to the survey are enthusiastic about developing more systematic and comprehensive DR screening. They will need support from policy-makers to address structural issues such as national policies, regulations and funding mechanisms if they are to be successful. They will also need to work with policy-makers to provide the national leadership to develop a screening pathway that addresses the fragmented and unorganized way in which screening currently is delivered in some countries/regions.

The findings suggest that professionals and policy-makers working together can create a coherent national strategy for DR screening and enable DR screening to be more systematic, equitable and effective.

The WHO Regional Office for Europe's DR screening short guide *(3)* provides guidance of how to develop a more systematic and pathway-led DR screening programme. Unless policy-makers and professionals together take a lead in driving forward this more systematic approach, more people with diabetes in the European Region may experience vision impairment and blindness unnecessarily.

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Annex 1. Situational analysis questionnaire

Diabetic Eye Screening – a Situational Analysis for the WHO European Region

Summer 2020

Please answer these questions consulting with other colleagues as needed to ensure the answers describe, as best you can, the current situation in your country. If data don't exist, we kindly ask you to please indicate this.

Your country's population

- Number of ophthalmologists available trained to treat diabetic retinopathy and maculopathy
- Number of people with diabetes-related blindness, where known (please provide source, e.g., blindness register, national organization supporting people with visual impairment/collecting data)

Current status of screening in your country

If your country has a federated or regional health system, please kindly describe any variation.

- Do you have national policies/frameworks/performance indicators/clinical guidelines on diabetic retinopathy screening/management? If so, please share their links or files (in original language if not available in English).
- How do you identify people who are eligible for screening (e.g., diabetes register, GP register, dispensing records)?
- How are people advised to attend for screening (formal written invitation, verbal recommendation, telephone invitation, patient request, informal, other – please describe)?
- Is there a formal call–recall system?
- Can you estimate what proportion of your diabetic population is invited for screening?
- What proportion of these attend for screening? How have you estimated this?
- Is there a system to monitor if people attend (fail-safe system)?
- What screening methods are available (indicate all that apply)?

Direct ophthalmoscopy		Optometrist	
Retinal photography		**Technician**	
Slit-lamp biomicroscopy		Endocrinologist	
		Ophthalmologist	

- What is the frequency of screening?
- Many countries recommend screening every year. Have you introduced longer intervals between screening (e.g., two years)? If so, is this risk-based (please identify risk factors used)?

- What systems do have in place to maintain the quality of the screening programme? Do you carry out audits of grading? Do you have any quality standards that you monitor?
- Do you have any clinical guidelines – if so, can you share?
- What training and competence assessment is available for professionals, including technical personnel? (Can you consider technicians, optometrists, ophthalmologists?)
- What access is there to treatments including laser, intraocular injections (anti-vascular endothelial growth factor, steroids) and vitrectomy?
- Have you introduced any new technologies into screening, such as optical coherence tomography, automated grading, electronic data transfer systems (including telemedicine), digital surveillance?
- Do you have any eye-screening leaflets for people with diabetes? If so, can you share these with us?
- Who pays for screening – insurance, private, co-payment, central budget? Does the person with diabetes pay? Please complete table.

	Screening	Call–recall system	Retinopathy treatment
Insurance, private, co-payment, central budget, other			
Any patient contribution required? Yes/No			

Developing screening for the future

- What would be the ideal model for screening for diabetic retinopathy suitable for your country context?
- What are the principle requirements you need to develop your ideal national screening programme? What do you consider are the barriers to implementation at present?
- What has been your experience of engaging with health providers (commissioners, health insurance companies, private and public sector) and patients so far?
- How do you currently evaluate the success of your programme if you have one?
- What are your tips for success? Please tell us about some of the key achievements that you've had.

Questions used to assess whether screening was organized/systematic or unorganized

- Do you have national policies/frameworks/performance indicators/clinical guidelines on diabetic retinopathy screening/management? If so, please share their links or files (in original language if not available in English).
- How do you identify people who are eligible for screening (e.g., diabetes register, GP register, dispensing records)?
- How are people advised to attend for screening (formal written invitation, verbal recommendation, telephone invitation, patient request, informal, other – please describe)?
- Is there a formal call–recall system?
- Can you estimate what proportion of your diabetic population is invited for screening?
- What proportion of these attend for screening? How have you estimated this?
- What systems do have in place to maintain the quality of the screening programme? Do you carry out audits of grading? Do you have any quality standards that you monitor?
- Do you have any clinical guidelines – if so, can you share?

Annex 2. Classification for Member States of the WHO European Region

Table A2.1 shows the classification used in the survey for Member States.

Table A2.1. Classification used in the survey for Member States[a]

Country	Income	European Union group[b]	Other group
Albania	Upper middle income	NA	SEEHN
Andorra	High income	NA	–
Armenia	Upper middle income	No	CIS
Austria	High income	EU15	–
Azerbaijan	Upper middle income	NA	CIS
Belarus	Upper middle income	NA	CIS
Belgium	High income	EU15	–
Bosnia and Herzegovina	Upper middle income	NA	SEEHN
Bulgaria	Upper middle income	EU13	–
Croatia	High income	EU13	–
Cyprus	High income	EU13	–
Czechia	High income	EU13	–
Denmark	High income	EU15	Nordic
Estonia	High income	EU13	–
Finland	High income	EU15	Nordic
France	High income	EU15	–
Georgia	Upper middle income	NA	–
Germany	High income	EU15	–
Greece	High income	EU15	–

Table A2.1 contd

Country	Income	European Union group[b]	Other group
Hungary	High income	EU13	–
Iceland	High income	NA	Nordic
Ireland	High income	EU15	–
Israel	High income	NA	SEEHN
Italy	High income	EU15	–
Kazakhstan	Upper middle income	NA	CIS
Kyrgyzstan	Lower middle income	NA	CIS
Latvia	High income	EU13	–
Lithuania	High income	EU13	–
Luxembourg	High income	EU15	–
Malta	High income	EU13	–
Monaco	High income	NA	–
Montenegro	Upper middle income	NA	SEEHN
Netherlands	High income	EU15	–
North Macedonia	Upper middle income	NA	SEEHN
Norway	High income	NA	Nordic
Poland	High income	EU13	–
Portugal – central region[c]	High income	EU15	–
Republic of Moldova	Upper middle income	NA	CIS
Romania	Upper middle income	EU13	SEEHN
Russian Federation	Upper middle income	NA	CIS
San Marino	High income	NA	–
Serbia	Upper middle income	NA	SEEHN
Slovakia	High income	EU13	–
Slovenia	High income	EU13	–
Spain	High income	EU15	–
Sweden	High income	EU15	Nordic
Switzerland – Lausanne[c]	High income	NA	–
Tajikistan	Lower middle income	NA	CIS
Turkey	Upper middle income	NA	–
Turkmenistan	Upper middle income	NA	CIS
Ukraine	Lower middle income	NA	CIS

Table A2.1 contd

Country	Income	European Union group[b]	Other group
United Kingdom[d]	High income	EU15[e]	–
Uzbekistan	Lower middle income	NA	CIS

CIS: Commonwealth of Independent States.
EU: European Union.
NA: not applicable.
SEEHN: South-eastern Europe Health Network.

[a] This classification is correct as of 1 July 2021.
[b] EU15: member of the EU before 2004; EU13: member of the EU after 2004.
[c] Respondents from these surveys answered questions for their region or hospital rather than providing a national perspective.
[d] The United Kingdom submitted four surveys, one from each of the four devolved administrations: England, Northern Ireland, Scotland and Wales.
[e] The United Kingdom was not a member of the EU at the time of the survey (2020) but had been a member of the EU before 2004, so is considered as part of the EU15 group for the purposes of this report.
Source: WHO Regional Office for Europe (2020). Health for All explorer. In: European Health Information Gateway [online database]. Copenhagen: WHO Regional Office for Europe (https://gateway.euro.who.int/en/hfa-explorer/, accessed 25 May 2021).

Annex 3. Participating countries and respondents

Participating countries and respondents are shown in Table A3.1.

Table A3.1. Participating countries and respondents

Country	Respondent(s)
Albania	Julinda Jaho Mimoza Meco Florian Toti
Andorra	Miquel Álvarez Marfany Xavier Avellanet Viladomat
Armenia	Diana Andreasyan Naira Gogyan Nune Yeghiazaryan
Austria	Felix Aberer Sonja Karst
Azerbaijan	Mushfig Karimov
Belgium	Christophe De Block Werner Dirven
Bosnia and Herzegovina	Halida Basić Amina Godinjak Meliha Halilbašić Amra Nadarević Vodenčarević
Bulgaria	Alek Oscar Galateya Tsvetkova
Croatia	Dario Rahelić Martina Tomić
Cyprus	Andreas Kontos
Czechia	Terezie Pelikanova Tomas Sosna
Denmark	Toke Bek Jakob Grauslund Marit Jørgensen
Finland	Nina Hautala Henna Cederberg-Tamminen Paula Summanen

Table A3.1 contd

Country	Respondent(s)
Georgia	Ana Apulava Elena Shelestova Lika Tsutskiridze
Germany	Hansjürgen Agostini Hans-Peter Hammes Klaus Lemmen Focke Ziemssen
Greece	Maria Niskopoulou
Hungary	Miklós Resch
Ireland	David Keegan
Israel	Irit Hochberg Gabriel Katz Naim Shehadeh
Italy	Roberto Perilli Massimo Porta
Kyrgyzstan	Nazgul Omurakunova
Latvia	Guna Laganovska
Lithuania	Vilma Jurate Balciuniene Edita Prakapiene
Luxembourg	Sandra Cardillo
Malta	Alastair Bezzina John Grech Hardie Mario Vella
Montenegro	Sreten Kavaric Emir Muzurovic
Netherlands	Yvonne de Jong-Hesse Reinier Schlingemann Erik Serné
Norway	Dag Fosmark Per Medbøe Thorsby
Poland	Elżbieta Bandurska-Stankiewicz Wojciech Matuszewski Sławomir Teper
Portugal	João-Filipe Raposo José Cunha-Vaz
Republic of Moldova	Natalia Palarie Alexa Zinaida
Russian Federation	Dmitriy Lipatov Olga Vikulova
San Marino	Gabriele Rinaldi
Serbia	Nebojsa Lalić Dijana Risimić Jelena Vasilijević
Slovakia	Viera Donicova Zbynek Schroner Jana Stefanickova

Table A3.1 contd

Country	Respondent(s)
Slovenia	Mojca Urbančič
Spain	Rodrigo Abreu Iñaki Llorente Gomez Alicia Pareja Ríos
Sweden	Karl-Johan Hellgren Johan Jendle
Switzerland	Lazaros Konstantinidis Anne Wojtusciszyn
Tajikistan	Salomat Kasymova Hakim Karimzade
Turkmenistan	Ministry of Health
Turkey	Z. Sehnaz Karadeniz
United Kingdom	Sanjiv Banerjee Hamish Courtney Michael Gavin David Owens Tunde Peto Sam Philip Peter Scanlon John Wilding
Ukraine	Andrii Korol Yana Saienko
Uzbekistan	Ministry of Health

The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

Member States

Albania
Andorra
Armenia
Austria
Azerbaijan
Belarus
Belgium
Bosnia and Herzegovina
Bulgaria
Croatia
Cyprus
Czechia
Denmark
Estonia
Finland
France
Georgia
Germany
Greece
Hungary
Iceland
Ireland
Israel
Italy
Kazakhstan
Kyrgyzstan
Latvia
Lithuania
Luxembourg
Malta
Monaco
Montenegro
Netherlands
North Macedonia
Norway
Poland
Portugal
Republic of Moldova
Romania
Russian Federation
San Marino
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Tajikistan
Turkey
Turkmenistan
Ukraine
United Kingdom
Uzbekistan

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