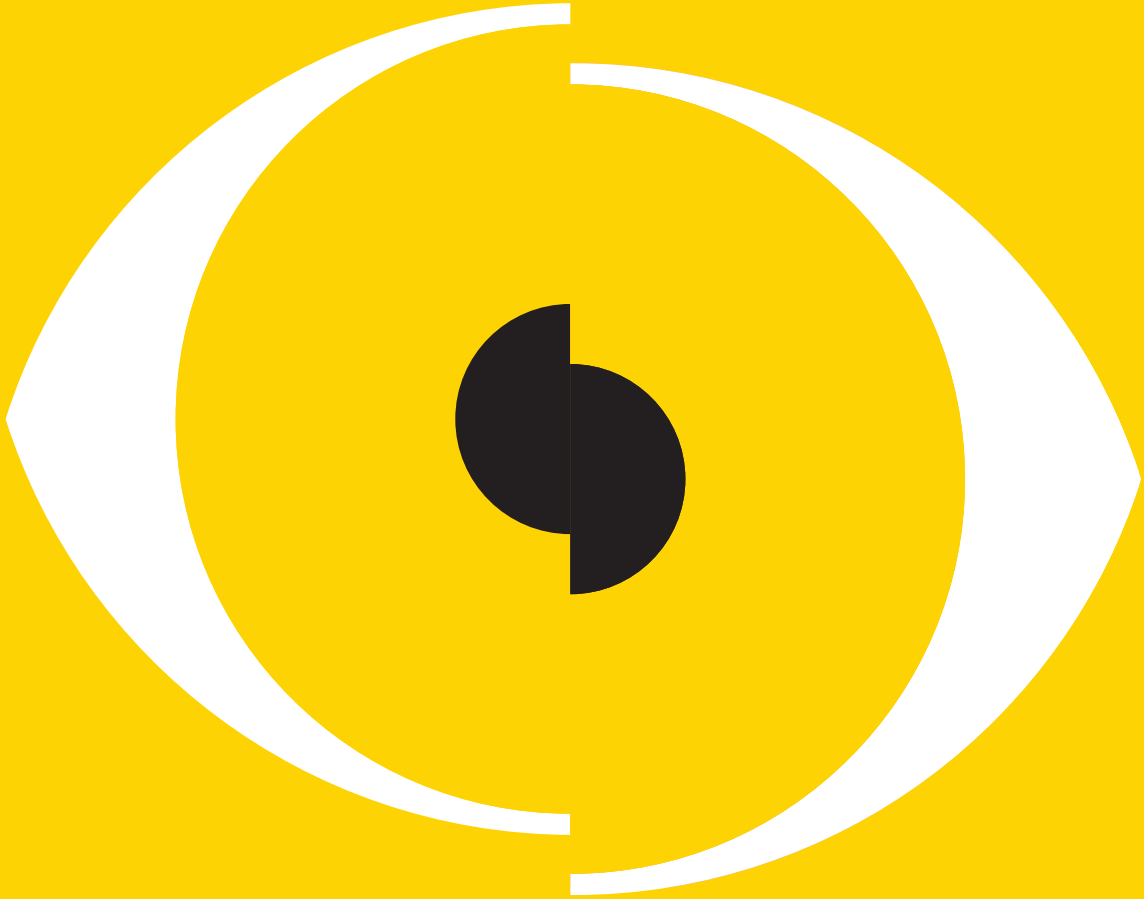
Refractive error situation analysis tool (RESAT)



World Health Organization

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Contents

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Assessment and management of conflict of interest from external reviewers

External reviewers completed a declaration of interest form disclosing potential conflicts of interest that might affect, or might reasonably be perceived to affect, their objectivity and independence in relation to the subject matter of the meeting / guidance. WHO reviewed each of the declarations and concluded that none could give rise to a potential or reasonably perceived conflict of interest related to the subjects discussed at the meeting or covered by the guidance.

Acronyms

BCVA	Best-corrected visual acuity
CME	Continuing medical education
CPD	Continuing professional development
ECSAT	Eye care situation analysis tool
eREC	Effective refractive error coverage
FTE	Full-time equivalent
HMIS	Health Management Information Systems
IPEC	Integrated people-centred eye care
NCDs	Noncommunicable diseases
NGO	Nongovernmental organizations
PHC	Primary healthcare
PVA	Presenting visual acuity
RAAB	Rapid Assessment of Avoidable Blindness
REC	Refractive error coverage
RESAT	Refractive error situation analysis tool
TADDS	Tool for the assessment of diabetic retinopathy and diabetes management systems
TAGS	Treatment of advanced glaucoma study
TARSS	Tool for assessment of rehabilitation services and systems
UCVA	Uncorrected visual acuity
VAT	Value-added tax

Introduction

Uncorrected refractive error is the leading cause of vision impairment in child and adult populations. It is estimated that at least 826 million people worldwide have distance- or near-vision impairment due to lack of access to refractive error services and spectacles (see Annex 1 for definitions on refractive errors and correction options) *(2)*. This figure is expected to rise during the next decade. Due to the world's ageing population, a higher prevalence of presbyopia is predicted *(3)*; furthermore, multiple studies show an increase in the number of young people developing myopia *(4)*.

In 2021, at the Seventy-fourth World Health Assembly, Member States endorsed the ambitious new global target of increasing effective refractive error coverage (eREC) by 40 percentage-points by 2030 *(5)*. Achieving this target will reduce the significant negative impact that unaddressed refractive error can have in terms of education, lost employment opportunities, and impaired quality of life *(1)*. Access to quality refractive error services is critical to integrated, people-centred eye care (IPEC) and should be prioritized. To support Member States in reaching the eREC target, WHO launched the WHO SPECS 2030 initiative.

Purpose of the tool

The purpose of the Refractive error situation analysis tool (RESAT) is to gather detailed background information for the planning of key areas of work to increase coverage of refractive error services.

RESAT is a questionnaire-based qualitative assessment tool developed by WHO to evaluate the current status of services that address refractive error at the national or subnational level, and to monitor progress towards universal refractive error service coverage. Through implementing RESAT, countries can identify the strengths and weaknesses of their refractive error services.

The primary objective of the survey is to assess the following factors in the refractive error system:

- availability, accessibility and affordability of services;
- integration of, and relevant regulatory framework for, services;
- training of, and capacity-building for, relevant skilled professionals;
- barriers to accessing services and implementation of support programmes.

The scope of this new analysis tool is based on a national health systems approach, rather than focusing on individual providers or institutions.

Several tools have been developed by WHO to assess the priority unaddressed needs for vision and eye care services. These include the Tool for assessment of rehabilitation services and systems (TARSS) *(6)*; the Tool for the assessment of diabetic retinopathy and diabetes management systems (TADDS) *(7)*; the Treatment of advanced glaucoma study (TAGS) *(8)* and now RESAT for refractive error services. In addition, the WHO Eye care situation analysis tool (ECSAT) provides a comprehensive assessment of the entire eye care service status at national level *(9)*.

Approach to development

RESAT was developed by WHO's Vision and Eye Care Programme. The RESAT questionnaire reflects content from five relevant WHO technical products: Eye care in health systems: guide for action (GfA) *(10)*; the Package of eye care interventions (PECI) *(11)*; the Eye care competency framework (ECCF) *(12)*; the Eye care situation analysis tool (ECSAT) *(9)*; and the Eye care indicator menu (ECIM) *(13)*. These products were developed by WHO between 2020 and 2023, with technical support from 360 experts across all WHO regions.

Overall, the design of RESAT aligns closely with ECSAT. While ECSAT assesses the wider eye care system, RESAT is condition-specific, focusing on refractive error. The maturity scoring of RESAT was developed in line with the scoring system applied in the ECSAT which was pilot tested in three countries.

Content of the RESAT assessment

RESAT is made up of eight sections that address eight components of refractive error service delivery, six of which align with the six WHO health system building blocks. Each component comprises a questionnaire and a maturity scoring system. To give a comprehensive overview of the available data and information regarding refractive error systems, all questionnaires and maturity score systems are designed to be completed.

Some of the questions in the questionnaires are categorized as “Core” and are considered essential. These questions are indicated by the use of red text and require a response. “Core” questions represent the minimum set of questions necessary for the assessment and evaluation of refractive error services in a country to determine priority for action.

Process of the RESAT assessment

Questionnaire

The questionnaire in each component gathers detailed information to guide the planning of key areas of work to increase coverage of refractive error services. The information necessary to complete the questionnaire can be derived from different sources including:

1. Desk-based data collection
   This may involve:

- Reviewing the prevalence of refractive errors and uncorrected refractive errors using published surveys such as the population-based eye health survey Rapid Assessment of Avoidable Blindness (RAAB), or equivalent, where available, at both regional and national levels. Data from school vision screening programmes, often available through the ministries of health or education, may also provide insights into uncorrected refractive errors.
- Identifying all relevant stakeholders and key informants (see Annex 2 for a comprehensive list).

2. Interviews with key informants
   This may involve:

- Sharing with all interviewees in advance, the list of topics for the situational analysis, allowing them to prepare any necessary data.
- A time frame of around 1 hour for completing the questionnaire (although not all sections may be applicable to every participant).
- Group interviews, which may be beneficial, bringing together multiple stakeholders or informants who share similar experiences or involvements in refractive error or eye care.
- Recording interview results – either by hand/computer-written notes; or, with the permission of interviewees, as audio files. Responses should be transcribed under the individual section headings of the survey to facilitate qualitative analysis. Quantitative data should be summarized by categories used in the RESAT assessment survey.
- All recordings being anonymous. The source of the information is important and may be recorded, but individuals must not be named.
- The perspectives of different stakeholders to be retrievable for analysis.

Maturity scoring system

The purpose of the maturity scoring system is to identify the components of eye care that have low scores (i.e. a score of 1 or 2) and may be prioritized in the planning process.

When completing the maturity scores in each section, the responder is asked to select one of four scenarios that best reflects the current situation – or level of maturity – of the specific eye care component, in their country or district. Each scenario has a corresponding score of 1 to 4. For example:

1. **Needs establishing** = Score 1

   A score of 1 implies that the component is missing or at a very initial stage of maturity; is either not established or just emerging; or that it exists but performs very weakly.

2. **Needs major strengthening** = Score 2

   A score of 2 implies the component is partially present or implemented; it is established but there are many areas that need improvement.

3. **Needs minor strengthening** = Score 3

   A score of 3 implies the component is present or implemented, but maturity is incomplete and there are areas needing improvement.

4. **Needs no immediate action** = Score 4

   A score of 4 implies that the component is present, implemented and requires no further investment of resources.

Time frame

The time frame needed to complete the assessment depends on the size and professional complexity of the country. The suggested time frame is 6–7 weeks; this includes 5 weeks for information gathering; 1 week for making the summary and preparing the workshop that gathers all the key stakeholders; half a day for conducting a workshop to share the RESAT assessment results and have further discussion; and 1 further week to write the workshop report that includes the RESAT assessment results and feedback received during the workshop discussions.

Ethics

The collection of data for research and publication purposes requires careful ethical consideration. In most countries, as there is no personal identification, no examination of person or body function, no interaction with body parts or biological specimen, ethical approval is not required for the RESAT assessment. However, there may be a requirement to obtain ethics approval in accordance with government (Ministry of Health) regulations and protocols in certain countries when publication of the final assessment report is expected. It is crucial for conductors of the RESAT assessment to consult local ethical guidelines and comply with the specific ethical requirements of their setting to ensure the integrity and acceptability of their work. These may include ensuring informed consent from participating facilities and maintaining confidentiality of potentially sensitive information about service providers.

THE RESAT ASSESSMENT SURVEY

Details of the RESAT assessor

First name	
Last name	
Profession or position	
Institution	
Street and number	
City	
Post code	
Country	
Telephone number	
E-mail	

Section 1. Background information

Questionnaire

Q1.1 **Is the implementation of RESAT owned or coordinated by the Ministry of Health? [CORE]** ☐ Yes ☐ No

Q1.2 **At what level is RESAT being used to analyse the refractive error services situation? [CORE]**

☐ National level (i.e. the entire country)

☐ Subnational level (i.e. a province or district)

Q1.3 **If subnational, please detail the geographical areas concerned: [CORE]**

Q1.4 **Please provide the following statistics for your country [CORE]**

Country/region	
Total population	
Population living below national poverty line (%)	

Q1.5 **Please provide the number of people in each target group affected by refractive errors [CORE]**

	Population	% of population with refractive error	Number of target population with refractive error
Example	***100 000***	***2%***	***2000***
Children aged 0–17 years			
Adults aged 18–39 years			
Adults aged 40–49 years			
Adults aged 50 years and over			

Q1.6 **Are there current data available on refractive error coverage (REC) or eREC? [CORE]** Yes No

Note: If primary data are not available for the country, please refer to the WHO modelled country estimates available at the WHO Global Health Observatory.

Q1.7 **If Yes, please provide the current data (i.e. the percentage from the last calendar year) related to distance and near vision refractive error coverage and effective coverage (see Annex 3 and 4 for definitions): [CORE]**

	Distance REC (%)	Distance eREC (%)	Near REC (%)	Near eREC (%)
Both sexes				
Female				
Male				

Section 2. Priorities, policies and programmes

Questionnaire

A. Leadership

The following questions relate to how refractive error services are governed and coordinated in your country, including the role of committees, steering groups, boards or task forces; and specifically the role of the Ministry of Health.

Q2.A1 **Is there a national committee for eye care which oversees refractive error corrective services? [CORE]** ☐ Yes ☐ No

Q2.A2 **Is there a dedicated task-force with key players in place to monitor refractive error services? [CORE]** ☐ Yes ☐ No

Q2.A3 **Please describe how political and financial commitment from the government to refractive error has changed in the past 5 years in your country or district: [CORE]**

Q2.A4 **Has the Ministry of Health invested in refractive error services within the past 5 years?** ☐ Yes ☐ No

Q2.A5 **Have district health authorities invested in refractive error correction within the past 5 years?** ☐ Yes ☐ No

Q2.A6 Which government department oversees the dispensing of spectacles?

- Ministry of Trade/Commerce
- Ministry of Health
- Other:

B. Legislation

The following questions relate to legislation: the key stakeholders and their roles in management of refractive errors; the existence and compliance with guidelines for the management of refractive errors, and the presence of policies or plans to support effective implementation.

Q2.B1 Is there a national plan or strategy for eye health? [CORE]

- Exists and is implemented
- Exists but is outdated
- Exists but is not implemented
- Does not exist

Q2.B2 If a national eye health plan exists, which aspects of IPEC are included in the plan/strategy?

- Development of refractive error services
- Population awareness programmes and campaigns
- Development of refraction human resources
- Integrating refractive error into wider health-care packages and policies
- Other, please specify:

Q2.B3 Who in the country can legally provide refractive services and prescribe spectacles? [CORE]

Ophthalmologists: ☐ Yes ☐ No

Optometrists: ☐ Yes ☐ No

Orthoptists: ☐ Yes ☐ No

Refractionists: ☐ Yes ☐ No

Ophthalmic nurses: ☐ Yes ☐ No

☐ Other, please specify:

Q2.B4 Are there policies to regulate the private sector providing refractive and optical services? [CORE] ☐ Yes ☐ No

Q2.B5 If Yes, please provide a brief description: [CORE]

Q2.B6 Is there legislation on the ownership of optical shops? [CORE] ☐ Yes ☐ No

Q2.B7 If Yes, please provide a brief description: [CORE]

Q2.B8 Are spectacles available within the public health sector? [CORE] ☐ Yes ☐ No

Q2.B9 If Yes, is there legislation on pricing of spectacles in the public health sector? [CORE] ☐ Yes ☐ No

Q2.B10 If Yes, please provide a brief description: [CORE]

Q2.B11 **Are current evidence-based clinical practice guidelines for the management of refractive errors, such as those developed by professional organizations or international health bodies, used in the country?** ☐ Yes ☐ No

Q2.B12 **If Yes, please provide a brief description:**

Q2.B13 **Are there standards (adopted international standards or national standards) on the quality of optical devices, including spectacles? [CORE]** ☐ Yes ☐ No

Q2.B14 **If Yes, please give a brief description: [CORE]**

Q2.B15 **What is the general/perceived level of compliance to standards on the quality of optical devices?**

☐ Poor ☐ Acceptable ☐ Good

Q2.B16 **Are there Ministry of Health endorsed guidelines for prescribing spectacles for children?** ☐ Yes ☐ No

Q2.B17 **If Yes, what is the level of compliance to the guidelines?**

☐ Poor ☐ Acceptable ☐ Good

Q2.B18 **Is there a policy on child eye health?** ☐ Yes ☐ No

Q2.B19 **If Yes, does the policy include refractive errors and provision of spectacles?** ☐ Yes ☐ No

Q2.B20 Is there a pre-school screening programme (i.e. children aged 3–5 years screened for refractive error and other vision and eye health conditions)? [CORE]

- Screening available and fully implemented
- Screening available but partially implemented
- Screening non-existent

Q2.B21 If a pre-school screening programme is in place, how frequently are pre-school children screened?

- Every _____ months
- Every _____ years

Q2.B22 Is there a school health programme that screens for refractive error and provides spectacles? [CORE]

- Screening available and fully implemented
- Screening available but partially implemented
- Screening non-existent

Q2.B23 If a school screening programme is in place, how frequently are school-aged children screened?

- Every _____ months
- Every _____ years

Q2.B24 If a school screening programme is in place, what percentage of schools in the country are covered by the programme? [CORE] %

Q2.B25 If a school health programme is in place, is there a referral system whereby children identified needing further care can be referred to an eye care provider? [CORE] Yes No

Q2.B26 Are there regulations in place to ensure that refractive error services are accessible for people with disabilities? Yes No

Q2.B27 Are there initiatives or programmes in place which incorporate refractive error services for elderly persons? ☐ Yes ☐ No

Q2.B28 If Yes, please describe briefly:

Q2.B29 Are there guidelines (laws/regulations) for vision correction for certain occupations, such as drivers, pilots, police officers, fire fighters, military personnel, others? ☐ Yes ☐ No

Q2.B30 Is there a policy regarding safety glasses for workers at risk of ocular trauma? ☐ Yes ☐ No

C. Prioritizing reorientation toward primary and community care

The following questions focus on assessing the availability and distribution of refractive error services across different levels of care, particularly in community and primary care settings.

Q2.C1 Please indicate the percentage of refractive error services that are provided at each level of care [CORE]

Type of eye care service provider	Community level (such as in homes and schools) (%)	Primary care (such as primary level health facilities) (%)	Secondary care (such as hospitals) (%)	Tertiary Care (such as specialized hospitals) (%)
Public health sector services				
Private for-profit services				
Private not-for-profit services, including domestic or foreign nongovernmental organizations (NGOs)				

Q2.C2 How were these data sourced?

- Estimate provided by the respondent
- Evidence-based
- Other, please specify:

Q2.C3 Does the country have a defined list of medical equipment for the provision of primary health care? Yes No

Q2.C4 If Yes, does the list include equipment for refractive error services, e.g. visual acuity charts, pinhole? Yes No

Maturity score

1. Existence of a national eye health plan where refractive error services figures among the priorities and is covered by eye care policies

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Uncorrected refractive error is not a priority; there is no national eye care plan and no national programme for refractive error services.
Needs major strengthening	2	Uncorrected refractive error is listed as a priority; there is a national eye care plan but refractive error services are not among the priorities.
Needs minor strengthening	3	Uncorrected refractive error is listed as a priority; a national eye care plan has been formulated and refractive error services are in place but do not cover the entire country/ population.
Needs no immediate action	4	Uncorrected refractive error is listed as a priority; both a comprehensive national eye care plan and a refractive error services programme are implemented, with nationwide coverage ensuring services reach the entire population.

2. Guidelines for the management of refractive error services

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	There are no Ministry of Health-recommended standards.
Needs major strengthening	2	Ministry of Health standards have been formulated but health professionals are unaware of their availability and therefore they are not widely used.
Needs minor strengthening	3	Ministry of Health standards are available and known to the appropriate audience but they are not widely followed.
Needs no immediate action	4	Ministry of Health standards have been formulated and are commonly followed.

Section 3. Service delivery

The questions of this component relate to: The level of integration of refractive error services into the public health system and with each other (networks); the presence and nature of referral pathways for refractive error services; locations of services; the provision of care in public and private services.

Questionnaire

Q3.1 Please provide the estimated number of refractions and spectacles needed in your country for the different age populations

	Total number of refractive errors (use calculations from table in Section 1)	**Frequency of replacement**	**Estimated total number of refractions and spectacles needed per annum**
Example	***2000***	***Every 2 years***	***2000***
Children aged 0–17 years		Every year	
Adults aged 18–39 years		Every 2 years	
Adults aged 40–49 years		Every 2 years	
Adults aged 50 and over years		Every 2 years	
Total			

Note: This calculation assumes that children need to replace their spectacles annually and adults every 2 years.

Q3.2 **Please give the number of resources available in your country that provide refractive error services, disaggregated by sector [CORE]**

	Public health sector facilities	Private not-for-profit facilities, including NGOs facilities	Private for-profit facilities	Other private for-profit facilities (e.g. private optometry practices/optical shops/ informal sector)	Total
Number of clinics, hospitals or others conducting refractions					
Number of spectacles dispensed per month					

Q3.3 **How were these data sourced?**

- ☐ Estimate provided by the respondent
- ☐ Evidence-based
- ☐ Other, please specify:

Q3.4 **Are contact lenses available by:**

- ☐ Prescription by eye health professional only
- ☐ Over-the-counter sales

Q3.5 How are ready-made near spectacles made available? [CORE]

- By over-the-counter sales
- Dispensed (for a fee or free of charge) by screening personnel (e.g. community health worker, primary health-care worker)
- Prescription by eye health professional only

Q3.6 Please give the average out-of-pocket costs of refractive error services to beneficiaries (individuals accessing the service) [CORE]

	Public health sector facilities (please indicate currency)	**Private not-for-profit, facilities, including NGOs facilities** (please indicate currency)	**Private for-profit facilities** (please indicate currency)
Average cost of refraction			
Average cost of prescription spectacles			
Average cost of ready-made spectacles			
Average cost of contact lenses			
Average cost of refractive surgery (both eyes)			
Average cost of 1 pair of CR39 +1.00 DS uncut blanks			

Q3.7 **How were these data sourced?**

- Estimate provided by the respondent
- Evidence-based
- Other, please specify:

Q3.8 **Is research undertaken in your country on the perceived barriers in access to refractive error services?** Yes No

Q3.9 **If Yes, please provide reference to the research (publication, repository, other):**

Q3.11 **Are refractive error services being audited periodically for quality?** Yes No

Q3.12 **Please provide information on any not-for-profit entities, including NGOs, involved in the provision of refractive error and optical services in the country:**

Q3.13 **Are you aware of any population groups underserved by refractive error services in your country?** Yes No

Q3.14 **If Yes, which population groups are these, and what is needed to fill these gaps?**

Maturity score

1. Location of refractive error services and accessibility to population in need

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Services are available in few places and accessible to few people. Services are not widely available; they can be found only in main urban areas, such as large cities, mainly in the private sector and are accessible only to those who can pay for them.
Needs major strengthening	2	Some services are available to part of the population. Services are available in main urban areas and are mainly paid for by the patients themselves or subsidized by the private not-for-profit sector, including NGOs. Populations in rural areas cannot reach services easily; transport to the refraction error facilities and the costs of service are the major barriers.
Needs minor strengthening	3	Services are widely available but do not reach some population groups. Services are available in most rural and urban areas, providing care at district, regional, provincial and tertiary levels; however, costs and transport are barriers for some patients.
Needs no immediate action	4	Services are widely available for the entire population. Services are available in all locations and costs are paid by insurance schemes, are subsidized, and are affordable.

2. Quality of refractive error services

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Critically inadequate. Refractive error services are largely insufficient, with significant gaps in quality, accessibility, and standards. No formal regulatory or quality assurance framework is in place.
Needs major strengthening	2	Basic framework exists but with limited implementation. Quality standards and protocols are only partially implemented. Monitoring and quality assurance systems are weak or inconsistently applied.
Needs minor strengthening	3	Established framework exists but with inconsistent enforcement. A more structured framework is in place, including defined quality standards and service protocols. However, enforcement of these standards is inconsistent, leading to variable quality across service providers.
Needs no immediate action	4	Comprehensive and well-regulated. High-quality services are widely available, with robust and consistently-enforced quality standards and protocols. Comprehensive monitoring, evaluation, and continuous improvement processes are in place to ensure consistent service excellence.

Section 4. Health workforce

The questions of this component relate to: The cadres, numbers, distribution and training of staff involved in refractive error services.

Levels of competency

All workforce-related tables in the questionnaire below have been categorized into the following levels of competencies:

- **Level 1:** Basic vision screening such as visual acuity testing, referrals, dispensing ready-made near spectacles (e.g. by trained community health workers, primary health workers, outreach screeners, teachers, pharmacists).
- **Level 2:** Intermediate vision examination and intervention, such as refraction, basic ocular health assessment, prescribing and dispensing spectacles (e.g. by vision technicians, optometry technicians, orthoptists) and/or intermediate interventions, such as cutting, fitting and dispensing custom-made spectacles (e.g. by optical dispensers, spectacle technicians, laboratory technicians).
- **Level 3:** Advanced vision examination and interventions, such as complex refractions, contact lens fitting, pharmacological care (e.g. by optometrists).
- **Level 4:** Expert vision examination and interventions, such as the diagnosis and management of complex refractive error conditions, surgical corrections (e.g. by ophthalmologists offering refractive care).

NOTE: Refractive error personnel may sometimes work across multiple levels, such as an optometrist conducting outreach screenings. To avoid duplication in the RESAT questionnaire, please **count each individual only once**, placing them in the category where they primarily deliver their services.

Questionnaire

Q4.1 **Please list the occupations that currently provide eye care in your country, at the different levels of competency, and whether they require licensing or registration [CORE]**

Level of competency	**Occupation titles in your country (e.g. optometrist)** (Note: there may be more than one at each level)	**Is licensing/registration required?** (Yes/No)
Level 1		
Level 2		
Level 3		
Level 4		

Q4.2 **Please provide the current number of full-time equivalent (FTE) personnel available in your country that actively provide refractive error services (among other services) [CORE]**

Level of competency	**Number in public health sector**	**Number in private not-for-profit sector, including NGOs**	**Number in private for-profit sector**	**Totals**	**Distribution of Urban (%)/ Rural (%)**
Level 1					
Level 2					
Level 3					
Level 4					
TOTALS					

Q4.3 How were these data sourced?

☐ Estimate by the respondent ☐ Evidence-based

☐ Other, please specify:

Q4.4 Is the current refractive error workforce adequate in meeting the needs of the population? [CORE] ☐ Yes ☐ No

Q4.5 Does the government take measures to ensure the appropriate distribution of refractive error personnel, in all geographical areas, where needed? ☐ Yes ☐ No

Q4.6 If Yes, which, if any, of these support supervision and mentoring mechanisms are typically in place for personnel in rural and remote contexts? Please tick all that apply:

☐ Access to appropriate and adequate training

☐ Accessible and adequate resources

☐ Active involvement in programme design, implementation and evaluation

☐ Financial incentives

☐ Regular feedback and evaluation of the programme

☐ Access to telemedicine mentoring and support

☐ Other, please specify:

Q4.7 Is the productivity of refractive error personnel working in the government sector currently being measured and monitored?* ☐ Yes ☐ No

*Note: Workforce productivity can be measured by the number of eye examinations or refractions performed per day, per week, or other specified time frame.

Q4.8 **If Yes, please specify how:**

Q4.9 **Are there any workforce gaps impacting the productivity of refractive error personnel? [CORE]**

Levels of Competency	Workforce gaps (yes/no)	
Level 1	Yes	No
Level 2	Yes	No
Level 3	Yes	No
Level 4	Yes	No

Q4.11 **If Yes, please specify what these are:**

Q4.12 **Can current productivity be enhanced/improved?** Yes No

Q4.13 **If Yes, please specify how by ticking all that apply:**

- Using existing human resources
- Developing coordination/incentive schemes
- Contributory voucher/subsidiary schemes
- Other, please specify:

Q4.14 Please provide information on the trainings available for refractive error services [CORE]

	Public health sector			Private not-for-profit, including NGOs		
Levels of competency	Number of training institutions/ programmes	Length of training (months or years)	Number of graduates per year	Number of training institutions/ programmes	Length of training (months or years)	Number of graduates per year
Level 1						
Level 2						
Level 3						
Level 4						
TOTALS						

Q4.15 What are the current general trends for successful graduates?

Levels of competency	Enter public service (%)	Enter private service (%)	Retained in the country (%)	Leave to go to other countries (%)	Employed in trained occupation (%)	Have left for other opportunities (%)
Level 1						
Level 2						
Level 3						
Level 4						

Q4.16 **Are there programmes, projects, or initiatives aimed at deploying new graduates to serve vulnerable populations (e.g. rural communities, urban poor)?** ☐ Yes ☐ No

Q4.17 **If Yes, please describe the scope and nature of these initiatives (e.g. public sector involvement, NGOs-led projects, or partnerships):**

Q4.18 **What proportion of deployments are focused on:**

Urban areas: ____ %

Rural areas: ____ %

Most vulnerable populations: ____ %

Q4.19 **Are there any incentive schemes to link training institutions to public placements?** ☐ Yes ☐ No

Q4.20 **If Yes, what are they?**

Q4.21 **Are there established and enforced continuing medical education (CME), and continuing professional development (CPD) regulations for refractive error personnel to ensure consistent service quality?** ☐ Yes ☐ No

Q4.22 **If Yes, what are they?**

Q4.23 **Are there mandatory, systematic quality assurance audits and performance reviews integrated into the licensing and registration process for refractive error personnel? [CORE]**

☐ Yes ☐ No

Q4.24 **Are there mechanisms in place to ensure that refractive error personnel adhere to standardized procedures and protocols? [CORE]**

☐ Yes ☐ No

Q4.25 **If Yes, what are they? [CORE]**

Q4.26 **If Yes, how is compliance tracked and reported? [CORE]**

Q4.27 **Is task re-allocation or task-shifting commonly used in your setting for providing the Level 1 service of screening?**

☐ Yes ☐ No

Q4.28 **If Yes, what are some of the occupations that are able to screen (outside of the ones listed in the table above)? Please tick all that apply:**

☐ Teachers

☐ Pharmacists

☐ Nurses

☐ Other, please specify:

Maturity score

1. Availability of refractive error personnel

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Significant staffing shortages severely impacting service delivery.
Needs major strengthening	2	Noticeable staffing challenges affecting service quality.
Needs minor strengthening	3	Minor staffing adjustments needed, services largely unaffected.
Needs no immediate action	4	Optimal staffing allowing for high-quality service delivery with potential for resource reallocation.

2. Training opportunities for refractive error service providers

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Severe shortage of training opportunities resulting in a critical lack of skilled personnel across all levels of competency.
Needs major strengthening	2	Few formal training options, mostly concentrated in urban centres, leading to substantial workforce gaps and skills deficiencies across many competency levels and geographical areas.
Needs minor strengthening	3	Some formal training available in multiple locations, but still inadequate to meet overall needs. Noticeable skills gaps persist in certain competency levels or geographical areas.
Needs no immediate action	4	Widespread, diverse, and well-structured training programmes covering all competency levels and geographical areas. Regular opportunities for skill development and career progression available.

Section 5. Health technology and supply

The questions of this component relate to: The availability, accessibility and functionality of equipment for the diagnosis, treatment, management and monitoring of refractive error by eye care and refractive error services providers.

Questionnaire

Q5.1 Please provide the availability of the infrastructure and equipment for the management of refractive errors, including for screening, testing, and dispensing facilities [CORE]

	Public health sector facilities	Private not-for-profit facilities, including NGOs facilities	Private for-profit facilities
Number with adequate equipment for screening			
Number with adequate equipment for refraction			
Number with adequate equipment for edging and fitting spectacles			

Q5.2 How were these data sourced?

- ☐ Estimate provided by the respondent
- ☐ Evidence-based
- ☐ Other, please specify:

Q5.3 Please give the availability of optical devices for the management of refractive errors [CORE]

	Public health sector facilities (Yes/No)	**Private not-for-profit facilities, including NGOs facilities** (Yes/No)	**Private for-profit facilities** (Yes/No)
Ready-made spectacles			
Single vision lenses			
Multifocal lenses			
Progressive lenses			
Myopia management lenses			
Contact lenses			
Refractive surgery			

Q5.4 How were these data sourced?

- ☐ Estimate provided by the respondent
- ☐ Evidence-based
- ☐ Other, please specify:

Q5.5 Does your country manufacture any of the following items locally?

- ☐ Ready-made spectacles
- ☐ Spectacle lenses
- ☐ Spectacle frames
- ☐ Contact lenses

Q5.6 **What import tax (including tariffs, custom-duties) and value-added tax (VAT) are payable on the following items (please specify percentage)? [CORE]**

	Import tax (%)	Value-added tax (%)
Ready-made spectacles		
Spectacle lenses		
Spectacle frames		
Contact lenses		

Q5.7 **Is there a public health sector system to negotiate and monitor procurement prices for spectacles? [CORE]** ☐ Yes ☐ No

Q5.8 **If Yes, please describe: [CORE]**

Q5.9 **Can imported products be dispensed without approval from the government? [CORE]** ☐ Yes ☐ No

Q5.10 **Generally, is there an adequate supply of cyclopentolate eyedrops for paediatric refraction at national level?** ☐ Yes ☐ No

Q5.11 **Are surveys on the availability of essential refraction equipment and spectacles carried out periodically in the public system?** ☐ Yes ☐ No

Q5.12 **If Yes, how often?**

Q5.13 **If Yes, which levels of the health system do they cover? Primary/Secondary/Tertiary?**

Q5.14 **Are trained technicians available to provide ophthalmic equipment maintenance?** Yes No

Q5.15 **If Yes, are they available in sufficient numbers?** Yes No

Maturity score

1. Availability of infrastructure and equipment for refractive error services, including screening, testing and dispensing facilities

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Most of the necessary infrastructure for effective refractive error services is not available. There are significant gaps across facilities, leading to frequent negative impacts on the services provided. Availability within health care is very low. Basic refraction equipment is not available in the majority of eye care facilities.
Needs major strengthening	2	Some of the necessary infrastructure for effective refractive error services is available, although many gaps exist across facilities. There is a low level of availability within health care, and this frequently impacts on services provided. Basic refraction equipment is available in main hospitals and private clinics only.
Needs minor strengthening	3	Most of the necessary infrastructure for effective refractive error services is available. There is a moderate level of availability within health care, but a few gaps exist that occasionally impact services provided. Advanced refraction equipment is available in most tertiary eye care facilities and some secondary facilities
Needs no immediate action	4	All necessary infrastructure for effective refractive error services is available. There is a high level of availability across all services; there are no infrastructure limitations impacting negatively on the services provided. Advanced refraction equipment is available throughout the country.

2. Availability of optical devices and diagnostics, including spectacles, frames, lenses, contact lenses and cyclopentolate

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	A very small and limited range of optical devices and diagnostics are financed and available, resulting in many profound unmet needs.
Needs major strengthening	2	A small range of optical devices and diagnostics are financed and made available to the population but there are many unmet needs.
Needs minor strengthening	3	A moderate range of optical devices and diagnostics that are needed by the population are financed and made available; there are a few unmet needs.
Needs no immediate action	4	The full range of optical devices and diagnostics that are needed by the population are financed and made available.

Section 6. Health information management systems

The questions of this component relate to: Key performance indicators; the information needed to be recorded for refractive error services; data collation, dissemination and communication.

Questionnaire

Q6.1 **Is there a national Health Management Information System (HMIS) in your country? [CORE]** ☐ Yes ☐ No

Q6.2 **If Yes, are there any eye care indicators included in the national HMIS? [CORE]** ☐ Yes ☐ No

Q6.3 **If Yes, are data on refractive errors included in the national HMIS? [CORE]** ☐ Yes ☐ No

Q6.4 **If Yes, how often are these data collected? [CORE]**

Q6.5 **If Yes, how often are these data reported? [CORE]**

Q6.6 **If Yes, are data disaggregated by age and sex? [CORE]** ☐ Yes ☐ No

Q6.7 **If Yes, who has access to the data? [CORE]**

Q6.8 **Does the national HMIS periodically collect information about outcomes and quality of refractive error services? [CORE]** ☐ Yes ☐ No

Q6.9 **If Yes, how often is it collected (in months)? [CORE]**

Q6.10 **If Yes, how is it collected? Please tick all that apply: [CORE]**

- ☐ Health facilities reporting
- ☐ Situation assessments
- ☐ Population-based surveys
- ☐ Other, please specify:

Q6.11 **Are data on the availability of private sector refractive error services (for-profit and not-for-profit) and/or utilization available? [CORE]** ☐ Yes ☐ No

Q6.12 **Are data on the availability of outreach programmes and school screening services and/or utilization available? [CORE]** ☐ Yes ☐ No

Q6.13 **Are data collected from the HIMS shared with the Ministry of Health? [CORE]** ☐ Yes ☐ No

Q6.14 **Have any population-based surveys on refractive error been conducted in the country within the past 5 years? [CORE]** ☐ Yes ☐ No

Q6.15 **If No, please provide the reason why. Please tick all that apply: [CORE]**

- ☐ No perceived need
- ☐ Data are available from previous surveys (more than five years ago) and no change is expected
- ☐ Perceived need but lack of sector advocacy and coordination
- ☐ Lack of funding
- ☐ Other, please specify:

Q6.16 **Were questions about spectacle use included in the last census?** ☐ Yes ☐ No

Maturity score

1. Knowledge of uncorrected refractive error magnitude

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Uncorrected refractive error prevalence, including presbyopia, is neither known nor estimated.
Needs major strengthening	2	Uncorrected refractive error prevalence is estimated for distance OR near vision.
Needs minor strengthening	3	Uncorrected refractive error prevalence for distance and near vision has been estimated; and data are used to analyse the needs at national level.
Needs no immediate action	4	Uncorrected refractive error prevalence for distance and near vision is known; patients' records are collated, analysed and regularly published.

2. Knowledge of outcomes and quality of refractive error services

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Health information systems generate no data from across any health facilities/ programmes regarding outcomes and the quality of refractive error services.
Needs major strengthening	2	Health information systems generate a little data from a few health facilities/ programmes regarding the outcomes and quality of refractive error services.
Needs minor strengthening	3	Health information systems generate some data from some health facilities/ programmes regarding outcomes and the quality of refractive error services, but they may not be comprehensive or routine.
Needs no immediate action	4	Health information systems routinely generate comprehensive data from across many health facilities/ programmes regarding outcomes and the quality of refractive error services.

Section 7. Health promotion for refractive error services and correction

The questions of this component relate to: Information about efforts to raise population awareness and literacy around eye health in general and refractive errors in particular

Questionnaire

Q7.1 **Is information provided to the public about refractive error? [CORE]** ☐ Yes ☐ No

Q7.2 **If yes, which age groups are targeted? [CORE]**

- ☐ Children
- ☐ Older adults
- ☐ All ages

Q7.3 **If Yes, how is this information provided? Please tick all that apply: [CORE]**

- ☐ Information brochures
- ☐ Newspapers
- ☐ TV
- ☐ Radio
- ☐ Social media avenues
- ☐ World Sight Day Campaigns
- ☐ Posters
- ☐ Internet
- ☐ Mobile apps
- ☐ Other, please specify: _____

Q7.4 **What is the coverage of health promotion on refractive errors? Please tick all that apply:**

- ☐ National
- ☐ Provincial/Regional
- ☐ District

Q7.5 **Are materials available in local languages and dialects? [CORE]**

- ☐ Yes
- ☐ No
- ☐ Not applicable

Q7.6 **If Yes, please provide details: [CORE]**

Q7.7 **Are there programmes on myopia awareness?** ☐ Yes ☐ No

Q7.8 **If Yes, please provide details:**

Q7.9 **Are there programmes on presbyopia awareness?** ☐ Yes ☐ No

Q7.10 **If Yes, please provide details:**

Q7.11 **Is information regarding the importance of spectacle compliance provided to children, and to parents, caregivers and teachers (such as how poor compliance can affect academic performance and other aspects of life)?** ☐ Yes ☐ No

Q7.12 **If Yes, please provide details:**

Q7.13 **What are the main factors that you believe limit the compliance to spectacle use?**
Please provide details:

Maturity score

1. Information and education provided to the community and to patients on refractive errors

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Little information is provided to the community and to patients.
Needs major strengthening	2	Information to the community is provided occasionally and only through national-level media; not all patients receive education.
Needs minor strengthening	3	Information to the community is provided at national and provincial levels; most patients receive education.
Needs no immediate action	4	Information is provided to the community at all levels; all patients receive education and community service organizations are actively involved.

2. Patient perception on the quality and effectiveness of refractive error services

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	The community perceives refractive error services to be of a very low level of quality and effectiveness; services are not valued at all and experience very low levels of demand.
Needs major strengthening	2	The community perceives refractive error services to be of a low level of quality and effectiveness; services are valued little and experience low levels of demand.
Needs minor strengthening	3	The community perceives refractive error services to be of a moderate level of quality and effectiveness; services are moderately valued and experience good demand.
Needs no immediate action	4	The community perceives refractive error services to be of a high level of quality and effectiveness; services are highly valued and experience strong demand.

Section 8. Health financing

The questions of his component relate to: Government expenditure, health insurance schemes, social security schemes; the provision of all stages and types of care for vulnerable population groups (e.g. people living in remote rural areas, people who are socioeconomically disadvantaged, elderly people or people with disability, and ethnic minorities).

Questionnaire

Q8.1 **Does a government health insurance scheme exist? [CORE]** ☐ Yes ☐ No

Q8.2 **If Yes, is it mandatory? [CORE]** ☐ Yes ☐ No

Q8.3 **If Yes, does it cover all members of the public? [CORE]** ☐ Yes ☐ No

Q8.4 **If No, what percentage of the population is covered by government health insurance? [CORE]** ☐ %

Q8.5 **If Yes, does insurance cover refractive error services and spectacles? [CORE]** ☐ Yes ☐ No

Q8.6 **Is refractive error coverage under private health insurance optional or required?**

☐ Optional ☐ Required

Q8.7 **If Optional, what percentage of the population is covered by private health insurance that includes refractive error coverage?** ☐ %

Q8.8 **Who is responsible for paying for private health insurance? Please tick all that apply:**

☐ Employer ☐ Employee ☐ Individual ☐ Government

Q8.9 Please provide information on the financing indicators for refractive error services and household income [CORE]

	Value	Currency
Total government expenditure on refractive error services per capita		
National mean monthly income per individual		
National mean monthly income per household		
Total out of pocket expenditure on refractive error per capita		

Q8.10 Please provide the percentage of those who bear the cost [CORE]

	% of cost covered by government health insurance	% of cost covered by private health insurance	% of cost covered by private not-for-profit schemes, including NGOs	% of cost covered by patient (out-of-pocket)	% of cost covered by others (please specify)
Refraction/ examination					
Spectacles					
Contact lenses					
Refractive surgery					

Q8.11 Is there a social scheme for the provision of refractive error services to vulnerable population groups? [CORE]

Yes No

Q8.12 If Yes, please indicate (by ticking in the relevant box/es) which refractive error provisions each category of people are entitled to [CORE]

	Free eye examinations	Free spectacles	Subsidized eye examinations	Subsidized spectacles	Other, please specify
Children					
Older adults					
People with disabilities					
People with low income					
Others, please specify					

Q8.13 If subsidization exists, how frequently can a patient access a new pair of spectacles using the government-based health financing mechanisms? [CORE]

Q8.14 Please list the items/services that can be claimed under government health insurance for refractive error correction: [CORE]

Q8.15 Please list the items/services that can be claimed under private health insurance for refractive error correction: [CORE]

Maturity score

1. Level of integration of refractive error services into financing mechanisms

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	There is very little or no integration of refractive error services into health financing mechanisms used for the provision of health care.
Needs major strengthening	2	There is limited integration of refractive error services into financing mechanisms used for the provision of health care; many opportunities exist to expand the integration.
Needs minor strengthening	3	The financing of refractive error services is integrated into most of the financing mechanisms used for the provision of health care.
Needs no immediate action	4	The financing of refractive error services is integrated into all the appropriate financing mechanisms used for the provision of health care.

2. Level of patient affordability of refractive error services

Please circle the score number below that best represents the situation in your country

Score		Maturity level
Needs establishing	1	Financial protection is inadequate; there are high out-of-pocket costs and many refractive error services are unavailable to the population because of significant financial barriers.
Needs major strengthening	2	The extent of the financing of all refractive error services interventions results in regular restrictions in service access because of out-of-pocket costs. Fees for refractive error services do not accommodate all clients, especially from low-income groups.
Needs minor strengthening	3	The extent of the financing of all refractive error services interventions results in low out-of-pocket costs, although there are programmes where costs can be prohibitive. Fee structures for refractive error services are available for average- and low-income groups.
Needs no immediate action	4	The extent of the financing for refractive error services interventions results in no, or very small, out-of-pocket costs, so all people in need of services can afford them.

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Annex 1. Definitions

- **Refractive error:** occurs when the shape of the eye prevents images focusing correctly on the light-sensitive layer at the back of the eye (the retina). This causes images to appear blurred, reducing visual acuity. There are four different types of refractive error: myopia, hypermetropia, astigmatism and presbyopia.

- **Refractive error services:** Refers to a range of services aimed at identifying, diagnosing, and managing refractive errors to improve visual acuity. This includes comprehensive eye examinations, visual acuity screenings, refractions, the fitting and dispensing of corrective lenses (spectacles or contact lenses), and patient education on eye health. These services may be provided by qualified professionals such as optometrists, ophthalmologists, and trained refractive error personnel, as well as community health workers and educators who conduct vision screenings.

- **Refractive error personnel:** All individuals involved in the provision of refractive error services. This encompasses not only those qualified to perform refractions, but also those involved in related tasks such as vision screening and spectacles dispensing. Examples include optometrists, refractionists, optical dispensers, ophthalmologists, allied ophthalmic personnel and primary healthcare (PHC) nurses, as well as community health workers and schoolteachers who provide vision screening and other related services.

- **Public health sector/government sector:** The component of a country's health system that is funded, managed, and operated by government entities at various levels (national, state/provincial, or local). Included are public hospitals, community health centres, government-run clinics, and other health-care facilities and services that are accessible to the general public, often at low or no cost. The public health sector is responsible for implementing population-wide health initiatives, disease prevention programmes, and ensuring equitable access to essential health services.

- **Not-for-profit entities/NGOs:** Organizations that operate independently of government control and are driven by specific social, humanitarian, or developmental objectives rather than profit. In the context of refractive error services, these may include charitable foundations, international aid organizations, or community-based groups that provide eye care services, distribute spectacles, or conduct vision screenings, often targeting underserved populations or filling gaps in public health services.

- **Private sector/for-profit entities:** Entities within the health system that are privately owned and operated with the primary goal of generating profit. In refractive error services, this includes private optometry practices, optical shops, private hospitals with ophthalmology departments, and manufacturers of spectacles and equipment. These businesses provide eye care services, sell corrective lenses and frames, and may also engage in research and development of vision care products, operating within market-driven principles while adhering to relevant health-care regulations.

- **Leadership:** Refers to the process of influence through which leaders gain support from others to achieve goals associated with improving and strengthening refractive error eye care.

- **Legislation:** Refers to the laws and policies developed within a country's constitutional frameworks and legal regimes that encompass refractive error services. It includes plans and strategies that relate to refractive error management. These are commonly agency-wide or sector-wide, action-orientated and aim to achieve specified goals and objectives.

- **Reorientation towards primary and community care:** Reorienting the model of care involves ensuring that health-care services prioritize primary and community eye care services. Prioritization includes adequate funding, workforce training and coordination with other services to ensure effective referral systems. Primary health care services are delivered in settings such as general practices, community health centres, allied health practices and via communication technologies such as telehealth and video consultations.

- **Refractive error service delivery**: Universal health coverage (UHC) is a global goal to ensure that every person can access quality health services (including refractive error services) without financial hardship. To achieve this, it is important to measure the accessibility of services as well as the quality of care they provide. To achieve accessibility to every person, refractive error services need to be free from barriers. These may include attitudinal, communication, physical, financial, geographical or social barriers.

- **Refractive error health workforce:** Refers to all personnel involved in the provision of refractive error services. This encompasses not only those qualified to perform refractions, but also those involved in related tasks such as vision screening and spectacles dispensing. Examples include optometrists, refractionists, optical dispensers, ophthalmologists, allied ophthalmic personnel and primary health care nurses, as well as community health workers who provide vision screening and other related services.

- **Health technology and supply:** Refers to not only the supply of optical devices such as spectacles and contact lenses, but also the diagnostic equipment required for refraction. Equipment required for the management of refractive errors is provided in Annex 5.

- **Health information systems**: A comprehensive framework that integrates data collection, processing, reporting, and use of the information necessary for improving health service effectiveness and efficiency through better management at all levels of health services. Countries require reliable data to assess the performance of their health services and plan for future needs. Data collection and analysis informs and underpins health related decision-making in health policy, management and clinical care.

- **Health promotion for refractive error services:** Part of IPEC is the empowerment of communities through eye health education. Health promotion, education and clinical counselling aim to promote the necessary knowledge, motivation and skills to empower people to increase control over their eye health and its promotive factors through health literacy efforts.

- **Refractive error health financing:** Refers to the extent to which refractive error services and spectacle provision is funded by government schemes insurance schemes and out-of-pocket payments

Annex 2. List of key informants to be interviewed

The following list comprises recommended key informants that may be interviewed as part of the desk-based data collection for RESAT:

- Government Ministry of Health:
  - Director-General of Health Services
  - Secretary or Assistant Secretary of Health
  - Division of noncommunicable diseases (NCDs)
  - Person in charge of school health programme
  - Person in charge of the department of community health promotion (child health/school health, health education & promotion, NCDs, National Eye Health Coordinator)
  - Person in charge of occupational health and safety
  - Director of Clinical Services
  - Department of Aged care/Disability
  - Department of Planning (Human Resource Department, Resource centre – HMIS)
  - Department of human resource management
  - Health technical support services (head of physical assets management)
  - Ophthalmology departments at public health sector hospitals
- Ministry of Education
  - Person in charge of school health programme
  - Person in charge of special needs education
  - Person in charge of inclusive education programme
- Ministry of Finance, Planning and Economic Development
  - Revenue Authority
  - Directorate of Economic Affairs (tax policy)
  - Bureau of Statistics
- Training Institutions involved in eye care
  - Optometry training institutions
  - Ophthalmology training institutions
  - Refractionists/ophthalmic technician training institutions
  - Spectacle/optical dispensing training institutions
  - Community health worker/primary health care worker training institutions
- Regulatory bodies
  - Medical council
  - Pharmacy and medicine boards
  - General optical council (if applicable)

- Ministry of Trade and Commerce
  - Bureau of Standards
- Person in charge of tariffs and taxes, Ministry of Labour:
  - Person in charge of public safety
  - Person in charge of transportation regulations (e.g. drivers, pilots, etc.)
  - Person in charge of unemployment or job training
- National and provincial/state level prevention of blindness committees
- National Association of People with Visual Impairment
- Local and international NGOs
- Academia: universities and other teaching institutions involved in the provision of refractive error services and eye care
- Professional organizations: optometrists, ophthalmologists, optometry technicians, refractionists, opticians, laboratory technicians/fabricators, orthoptists, maternal and child health nurses, teachers
- Professional associations: optometrists, ophthalmology associations, ophthalmic clinical officer/refractionist associations, spectacle/optical dispensing associations
- Private sector: optical chain stores and franchises, optical group practices, private health insurance providers
- Central/national medical stores
- Informal sector: optical products suppliers' organizations, optical/spectacle dispensers and technicians
- Supply chain: optical goods wholesalers, distributors, importers and local manufacturers
- Consumer/patient representative organizations
- Business sector: employer/employee work safety agents

Annex 3. eREC: distance vision

Rationale: eREC at distance vision not only captures the magnitude of coverage, but also the concept of "effective" coverage to ensure that people who need health services receive them with sufficient quality to produce the desired gain in vision. Thus, these data are valuable to assess the accessibility and quality of refractive error services within a country.

Definition: The proportion of people who have received refractive error services (i.e. spectacles, contact lenses or refractive surgery) and have a resultant good quality outcome relative to the number of people in need of refractive error services for distance vision.

All visual acuities are measured for distance vision. Presenting visual acuity (PVA) is the measure of unaided vision; or, if spectacles or contact lenses are worn to the assessment, visual acuity is measured with the person wearing these. Best-corrected visual acuity (BCVA) is assessed either by pinhole or refraction. For measuring uncorrected visual acuity (UCVA), if spectacles or contact lenses are worn to the assessment, visual acuity is measured with the person not wearing these.

Numerator:

a. Individuals with UCVA worse than 6/12 in the better eye who present with spectacles or contact lenses for distance vision and whose PVA is equal to or better than 6/12 in the better eye ("met need").

b. Individuals with a history of refractive surgery whose UCVA is equal to or better than 6/12 in the better eye ("met need").

Denominator:

a. Individuals with UCVA worse than 6/12 in the better eye who present with spectacles or contact lenses for distance vision and whose PVA is equal to or better than 6/12 in the better eye ("met need").

b. Individuals with a history of refractive surgery whose UCVA is equal to or better than 6/12 in the better eye ("met need").

c. Individuals with UCVA worse than 6/12 in the better eye who present with spectacles or contact lenses for distance vision and a PVA of worse than 6/12 in the better eye, but who improve to equal to or better than 6/12 on pinhole or BCVA ("undermet need").

d. Individuals with UCVA worse than 6/12 in the better eye who do not have distance vision correction and who improve to equal to or better than 6/12 on pinhole or BCVA ("unmet need").

Disaggregation: Age, sex, geography (e.g. urban *vs* non-urban) and socioeconomic status.

Method of measurement for distance REC:

$$\left(\frac{a+b+c}{a+b+c+d}\right) \times 100$$

Method of measurement for distance eREC:

$$\left(\frac{a+b}{a+b+c+d}\right) \times 100$$

Method of measurement of the distance relative quality gap:

$$\left(\frac{REC\ distance - eREC\ distance}{REC\ distance}\right) \times 100$$

Expressed as: Percentage.

Frequency of measurement: Every 5 years.

Annex 4. eREC: near vision

Rationale: eREC at near vision not only captures the magnitude of coverage, but also the concept of "effective" coverage to ensure that people who need health services receive them with sufficient quality to produce the desired gain in vision. Thus, these data are valuable to assess the accessibility and quality of refractive error services within a country.

Definition: The proportion of people who have received refractive error services (i.e. spectacles or contact lenses or refractive surgery) at near vision and have a resultant good quality outcome relative to the number of people in need of refractive error services for near vision.

All visual acuities are measured for near vision. PVA is the measure of unaided vision; or, if spectacles or contact lenses are worn to the assessment, visual acuity is measured with the person wearing these. BCVA is assessed either by pinhole or refraction. For measuring UCVA, if spectacles or contact lenses are worn to the assessment, visual acuity is measured with the person not wearing these.

Numerator:

a. Individuals with UCVA worse than N6 at 40 cm in the better eye, who present with spectacles for near vision and whose PVA is equal to or better than N6 in the better eye ("met need").

Denominator:

a. Individuals with UCVA worse than N6 at 40 cm in the better eye who present with spectacles for near vision and whose PVA is equal to or better than N6 in the better eye ("met need").

b. Individuals with distance BCVA that is equal to or better than 6/12 in at least one eye, who present with spectacles for near vision and whose PVA is worse than N6 in the better eye ("undermet need").

c. Individuals with distance BCVA that is equal to or better than 6/12 in at least one eye, who do not have correction for near vision and whose UCVA is worse than N6 in the better eye ("unmet need").

Disaggregation: Age, sex, geography (e.g. urban *vs* non-urban) and socioeconomic status.

Method of measurement for near REC:

$$\left(\frac{a+b}{a+b+c+d}\right) \times 100$$

Method of measurement for near eREC:

$$\left(\frac{a}{a+b+c+d}\right) \times 100$$

Method of measurement of the near relative quality gap:

$$\left(\frac{REC\ near - eREC\ near}{REC\ near}\right) \times 100$$

Expressed as: Percentage.

Frequency of measurement: Every 5 years.

Annex 5. Equipment requirements for eye care examinations focused on refractive error, by level of care*

Clinical examination	Equipment and consumables requirements at different levels of care[1]		
	Community and Primary	**Primary plus**	**Secondary and Tertiary[2]**
Visual acuity (distance, near and pinhole)	Snellen charts with letters, pictures, numbers, and tumbling E's; Pinhole; Measuring tape/rope; Patch/occluder	n/a[3]	LogMAR charts; LEA Symbols; Sloan letters; HOTV charts; Kay's pictures
Preferential looking visual acuity testing (for infants and toddlers)	n/a	n/a	Toys with detail for fixation (illuminated and non-illuminated); Teller acuity cards; Cardiff acuity test; LEA gratings
Torchlight examination (external eye assessment)	Torch/transilluminator/phone flashlight; Fixation object	n/a	n/a
Slit lamp examination	n/a	n/a	Slit Lamp Biomicroscope; 60D, 78D lens or 90D lens; Stand and table top for slit lamp
Automated refraction	n/a	n/a	Autorefractor; Photoscreener; Software
Subjective refraction	n/a	Universal trial frame; Trial lens set (full diameter with minimum number of trial lenses); Lens bars; Cross cylinder; Light box	Full aperture trial lens set; Pediatric trial frame
Retinoscopy	n/a	n/a	Retinoscope; Retinoscopy lens rack
Contrast sensitivity	n/a	n/a	Pelli-robson chart; Bailey Lovie chart
Duochrome	n/a	n/a	Duochrome test chart

* *Source*: the WHO Package of eye care interventions.

[1] For some clinical examinations, the equipment and consumables listed are interchangeable, representing different options depending on preferences, resources available and/or geographical availability.

[2] Represents additional equipment and consumables to that mentioned at lower levels of care.

[3] n/a: not applicable (i.e. not suitable for that particular level of care; personnel are not trained in that specific skill).

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https://www.who.int/health-topics/blindness-and-vision-loss