

# 2023 Global Survey of Optometry: Defining Variations of Practice, Regulation and Human Resources Between Countries

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**Purpose:** To provide information on the demographics of optometrists and regulation of the optometry profession in countries who were members of the World Council of Optometry (WCO) during the period 2022–2023.

**Methods:** A non-random, purposive sampling and a key informant strategy was employed to conduct a survey-based cross-sectional study on the professional landscape and distribution of optometrists; educational landscape; legislative aspects of the profession; and the scope of optometry practice in countries who were members of WCO during the period 2022–2023. Key informants were identified by WCO country members' leadership.

**Results:** In the 39 countries surveyed, one optometrist serves 23,200 persons on average. Only 46.2% of the countries met the internationally suggested 1:10,000 optometrist-to-population ratio. The average male-to-female ratio was 45% males/55% females, with a division of average age as follows: under 45 years of age 46% as compared to above 45 years of age 54%. It was reported that optometry is not regulated in France, Portugal, India, Kenya and Cameron. Thirteen countries (33%) do not require a Bachelor's degree as a minimum to practice optometry. Use of diagnostic drugs is prohibited in 20% of the countries, with 25% of the countries limiting the use of therapeutic pharmaceutical agents.

**Conclusion:** Many countries where optometry is recognized struggle to have an adequate number of optometrists; this hinders access to eye care. This is compounded by unregulated minimum levels of education for entry-level optometric practitioners. In addition, several countries limit or prohibit many optometric procedures that restrict the ability of optometrists to provide eye care and vision health services at the primary care level.

**Keywords:** eye care, scope of practice, optometrist, global distribution, legislation

## Introduction

In 2019, the World Health Organization (WHO) released the first ever report on the state of vision impairment and blindness around the globe,<sup>1</sup> the World Report on Vision (WRV).<sup>1</sup> The WHO highlighted some of the past few decades' successful global concerted action tackling eye problems, but also brought to focus the immense challenges that healthcare systems face moving forward. One of the most significant outcomes of the report was data that focused on the current state of preventable vision impairment as well as the projected substantial increase in the overall number of people with visual impairment and blindness. The main causes are uncorrected refractive error and cataracts, followed by many other ocular conditions that contribute to the increasing prevalence of visual impairment. Many of the problems outlined can be managed at the primary care level by optometrists.<sup>2</sup> The WRV together with other significant publications outline the importance of the need for sufficiently qualified optometrists to serve the eye care needs of their populations.<sup>3,4</sup> The WHO recommends a ratio of one optometrist to every 50,000 persons,<sup>5</sup> while a ratio of one optometrist to 10,000 persons is observed in a number of developed countries.<sup>4</sup> In other developed countries, where number of optometrists far exceed the

recommended minimum, access to eye care is affected by issues such as ethnicity, insurance coverage and geographic region.<sup>6</sup> Central sub-Saharan Africa reports only one optometrist for approximately one million persons, while many countries in Western Europe have a ratio of almost one optometrist to every 4000 persons.<sup>7</sup> Significant inequities exist in people's ability to access vision care. The burden of preventable vision loss is particularly pronounced in areas of social and economic disadvantage, rural regions, among older individuals, ethnic minorities, indigenous peoples, and women.<sup>8</sup>

There exists significant confusion about the quality of skills of optometric personnel, which exacerbates misconceptions of optometry by the public, policymakers, and other medical professionals, and creates a barrier to recognizing optometrists as primary eye care providers in some countries. It has been suggested that a consistent professional identity needs to be developed which covers all countries in which optometry exists and is recognized as an autonomous profession.<sup>9</sup> Limited data, however, is available on the number and distribution of optometrists globally, as well as their level of education, legislative status, and scope of practice.<sup>7,10</sup> The main aim of this study was to provide information on the demographics of optometrists and the distribution of optometry in countries who were members of the World Council of Optometry during the period 2022–2023. In addition, an insight on the legislative aspects of the profession was obtained from the surveyed countries. The extensive descriptive information and data generated from this study is expected to provide policy makers at national and international levels with evidence-based information. This information may help them understand the current state of optometry's workforce and fulfill the World Health Organization's call for optometry services to provide people-centered eye care.

## Material and Methods

### Study Design

A cross-sectional study utilizing quantitative methods was conducted between January and December 2023. Non-random, purposive sampling and a key informant strategy were employed, where the key informants were nominated by the World Council of Optometry country members' leadership. A standardized English language questionnaire was designed and adapted from the questionnaire used by the European Council of Optics and Optometry (ECOO).<sup>11</sup> The questionnaire was reviewed by a panel of global optometrists for clarity and feasibility and was edited prior to distribution to the key informants. The questionnaire included questions relating to the: professional landscape and distribution of optometrists; educational landscape; legislative aspects of the profession; and the scope of optometry practice. Following the questionnaire, key informants were individually interviewed to ensure that they understood each question and had responded accordingly.

### Statistical Analysis

All responses were coded and entered into a Microsoft Excel spreadsheet (2019, version 16.43, Microsoft Corporation, Redmond, WA, USA). Descriptive statistics in the form of frequencies and distribution were conducted using SPSS version 25 (IBM Corporation, Armonk, NY, USA). For statistical analysis purposes, countries were divided into groups as per the Global Burden of Disease (GBD) Regions adopted by the Institute for Health Metrics and Evaluation.<sup>12</sup> The reported number of optometrists and the population of each country as per the United Nations Population Fund data obtained in January 2024<sup>13</sup> was used to calculate the optometrist-to-population ratio. The WCO Competency Framework for Optometry was used to analyze the data related to the scope of optometry practice.<sup>14</sup> This framework divides the graduate outcome competencies expected for entry-level optometrists into five domains:

1. Refractive error assessment and management: subjective and objective refraction, near point and presbyopia, spectacles, contact lenses, myopia management, cycloplegia.
2. Visual function assessment and management: binocular vision, vision impairment assessment, vision rehabilitation, vision development, vision and learning, color vision, occupational visual assessments, persons with disabilities.
3. Ocular health assessment and management: anterior and posterior segment assessment utilizing biomicroscopy, topography, direct and indirect ophthalmoscopy, optical coherence tomography, ultrasonography, visual field testing including perimetry, neurologic evaluation including pupillary testing, color vision, signs and symptoms of ocular disease, ocular signs of systemic disease, pharmacology, management, referral, diagnostic pharmaceutical agents, therapeutic pharmaceutical agents.

4. Public health: the demographics, social determinants of health and epidemiology of the community and the patient population, information on visual and general health and welfare, current trends, and topical issues regarding eyes, vision, health care, and health literacy.
5. Professional practice: ethics, communication, case history, examination plans, management plans, record-keeping, referral documents, and reports to other members of the patient's health care team.

## Ethical Approval

The study was conducted as per the tenets of the Declaration of Helsinki. Ethical approval was obtained from the London School of Hygiene and Tropical Medicine Observational/Interventions Research Ethics Committee (approval number: 28008). Informed consent was obtained from the key informants prior to filling the questionnaire, while verbal consent was obtained prior to the video interview that followed the questionnaire.

## Results

### Demographics of the Optometrists

Data from 39 out of 40 country members of WCO invited to participate were included in the analysis (response rate of 97.5%). Table 1 details the demographics of optometrists and the optometrist-to-population ratio. The mean of all the individual country male to female ratios was 45% males/55% females, with a more female workforce observed in high income countries (average 63%), compared to Sub-Saharan Africa, where the optometric workforce is predominantly male (average 62%). On average, 54% of the optometrists in the surveyed countries are above the age of 45 years. Latin

**Table 1** Demographics by Global Burden of Disease Regions

Global Burden of Disease Region (n=39)	Countries	Reported number of optometrists	Sex distribution (%)		Age distribution (%)		Optometrist-to-population ratio	Reached 1:10,000 ratio
			Males	Females	< 45 years	>45 years		
High Income (n=12)	Australia	6785	40%	60%	40%	60%	1:3897	Yes
	Austria	1050	30%	70%	50%	50%	1:8532	Yes
	Canada	6477	30%	70%	50%	50%	1:5988	Yes
	France	3500	40%	60%	35%	65%	1:18,502	No
	Ireland	950	40%	60%	50%	50%	1:5323	Yes
	New Zealand	1051	40%	60%	40%	60%	1:4974	Yes
	Portugal	1690	25%	75%	20%	80%	1:6064	Yes
	Singapore	1317	50%	50%	50%	50%	1:4567	Yes
	Sweden	2000	35%	65%	40%	60%	1:5306	Yes
	Switzerland	2200	30%	70%	50%	50%	1:3998	Yes
	United Kingdom	20,000	50%	50%	50%	50%	1:3387	Yes
	United States	36,690	30%	70%	50%	50%	1:9267	Yes
South Asia (n=3)	Bangladesh	300	75%	25%	40%	60%	1:576,514	No
	Nepal	1300	55%	45%	50%	50%	1:23,767	No
	India	80,000	40%	60%	40%	60%	1:17,858	No

(Continued)

Table 1 (Continued).

Global Burden of Disease Region (n=39)	Countries	Reported number of optometrists	Sex distribution (%)		Age distribution (%)		Optometrist-to-population ratio	Reached 1:10,000 ratio
			Males	Females	< 45 years	>45 years		
<b>Southeast Asia, East Asia, Oceania (n=4)</b>	Hong Kong	1264	70%	30%	40%	60%	1:5927	Yes
	Malaysia	2989	35%	65%	50%	50%	1:11,478	No
	Philippines	11,634	20%	80%	65%	35%	1:10,086	No
	Sri Lanka	300	65%	35%	65%	35%	1:72,979	No
<b>Sub-Saharan Africa (n=8)</b>	Botswana	56	55%	45%	35%	65%	1:47,774	No
	Cameroon	11	70%	30%	60%	40%	1:2,604,299	No
	Ethiopia	560	55%	45%	5%	95%	1:225,941	No
	Kenya	580	85%	15%	85%	15%	1:95,001	No
	Nigeria	5716	55%	45%	25%	75%	1:39,154	No
	South Africa	4040	45%	55%	50%	50%	1:14,954	No
	Uganda	33	80%	20%	10%	90%	1:1,472,192	No
	Zimbabwe	60	50%	50%	75%	25%	1:277,757	No
<b>North Africa and Middle East (n=6)</b>	Iran	3000	50%	50%	50%	50%	1:29,724	No
	Iraq	1200	65%	35%	50%	50%	1:37,920	No
	Jordan	2100	40%	60%	35%	65%	1:5399	Yes
	Lebanon	650	30%	70%	30%	70%	1:8237	Yes
	Palestine	450	20%	80%	25%	75%	1:11,936	No
	Saudi Arabia	1280	40%	60%	40%	60%	1:28,865	No
<b>Latin American and Caribbean (n=6)</b>	Colombia	6900	30%	70%	50%	50%	1:7549	Yes
	Guyana	90	30%	70%	70%	30%	1:9043	Yes
	Jamaica	33	50%	50%	50%	50%	1:85,623	No
	Mexico	6000	35%	65%	50%	50%	1:21,409	No
	Puerto Rico	460	35%	65%	70%	30%	1:7088	Yes
	Trinidad and Tobago	196	25%	75%	50%	50%	1:7831	Yes

American and Caribbean countries have a younger workforce (57% under the age of 45 years), while 67% of optometrists in North Africa and the Middle East are above the age of 45 years. In terms of optometrist-to-population ratio, one optometrist serves 23,200 persons on average across all countries responding combined. In high-income countries, one optometrist serves 7080 persons, in contrast to Sub-Saharan Africa where one optometrist serves 50,870 persons on average. Only 46% of the countries meet the 1:10,000 optometrist-to-population ratio observed in developed countries, with 92% of high-income countries achieving this ratio, whereas none of the Sub-Saharan African countries achieving that target.

## Regulation of the Optometry Profession

Table 2 shows the regulation of the optometry profession across the Global Burden of Disease Regions. The profession of optometry is not regulated in the following countries: France, Portugal, India, Cameroon, and Kenya. One element of the survey was to investigate if the professional title “optometrist” is protected. A protected professional title means the use of a title in a professional activity is subject to legislative or regulatory provisions restricting its use to individuals with a specified qualification, and where the improper use of that title is subject to legislative action. Absence of protections around the use of the title “optometrist” means those without formal optometry education can use the title, leading to inconsistencies in professional standards and scope of practice. The use of the professional title “optometrist” is not protected in 33% (13/39) countries: France, Portugal, India, Malaysia, Sri Lanka, Cameroon, Kenya, Nigeria, Zimbabwe, Iran, Lebanon, Saudi Arabia, and Guyana. Tertiary education at a Bachelor degree level or higher is not required to practice optometry in 33% (13/39) countries: France, Portugal, Austria, Singapore, Argentina, India (diploma), Sri Lanka, Ethiopia, Kenya, Uganda, Iraq, Jordan, and Palestine. And 33% (13/39) do not require optometrists to renew their license/registration including France, Portugal, Austria, Switzerland, Argentina, Sweden, India, Sri Lanka, Iraq, Lebanon, Palestine, Columbia, Mexico. Continuing education hours are not a requirement to renew the license or registration in 41% (16/39) the following countries: France, Portugal, Austria, Switzerland, Argentina, Sweden, India, Sri Lanka, Botswana, Iraq, Lebanon, Palestine, Columbia, Mexico, Trinidad and Tobago, and Jamaica.

## Scope of Practice Surveyed

Table 3 depicts scope of practice in the surveyed countries divided into the domains listed in the WCO Competency Framework for Optometry. The refractive assessment and management domain is the least restricted in the surveyed countries; remote refraction is prohibited in 26% of the countries. Use of cycloplegic agents is prohibited in Argentina, France, Iraq, Lebanon, and Singapore. Very few countries restrict certain elements of the visual function assessment and management domain, with France being the only responding country restricting the assessment and management of

**Table 2** Regulation of Optometry in Surveyed Countries Divided as per the Global Burden of Disease Regions (n=39)

Variable	Category	High Income (N=12)	South Asia (N=3)	Southeast Asia, East Asia and Oceania (N=4)	Sub-Saharan Africa (N=8)	North Africa and Middle East (N=6)	Latin American and Caribbean (N=6)
Optometry profession is regulated by law	Yes	10 (83%)	2 (67%)	4 (100%)	6 (75%)	6 (100%)	6 (100%)
	No	2 (17%)	1 (33%)	-	2 (25%)	-	-
Professional title “optometrist” is protected by law	Yes	10 (83%)	2 (67%)	2 (50%)	4 (50%)	3 (50%)	5 (83%)
	No	2 (17%)	1 (33%)	2 (50%)	4 (50%)	3 (50%)	1 (17%)
Tertiary education at a Bachelor’s degree level or higher is required to practice optometry	Yes	7 (58%)	2 (67%)	3 (75%)	5 (63%)	3 (50%)	6 (100%)
	No	5 (42%)	1 (33%)	1 (25%)	3 (37%)	3 (50%)	-
Existence of further requirements to practice optometry*	Yes	6 (50%)	-	2 (50%)	4 (50%)	4 (67%)	3 (50%)
	No	6 (50%)	3 (100%)	2 (50%)	4 (50%)	2 (33%)	3 (50%)
Renewal of optometry licensing or registration is required by law	Yes	6 (50%)	2 (67%)	3 (75%)	8 (100%)	4 (67%)	4 (67%)
	No	6 (50%)	1 (33%)	1 (25%)	-	2 (33%)	2 (33%)
Continuing education is required by law to renew optometry license	Yes	6 (50%)	-	2 (50%)	7 (87%)	3 (50%)	2 (33%)
	No	6 (50%)	3 (100%)	2 (50%)	1 (13%)	3 (50%)	4 (67%)

**Notes:** \*Further requirements to practice include any or combination of the following: board examinations, pre-registration period, supervised clinical training.

**Table 3** Countries and Territories with Restrictions to Specific Elements in Each Domain of the WCO Competency Framework for Optometry\*

<b>Domain One – Refractive Error and Management</b>	
<b>Element</b>	<b>Country/Territory</b>
Remote refraction	Argentina, Ireland, Nepal, Malaysia, Botswana, Cameroon, South Africa, Jordan, Lebanon, Puerto Rico
Use of cycloplegic drugs	Argentina, Singapore, France, Iraq, Lebanon
<b>Domain Two – Visual Function Assessment and Management</b>	
<b>Element</b>	<b>Country/Territory</b>
Strabismus, Amblyopia, Orthoptics	France
Certify vision for driving license	Argentina, India, Sri Lanka, Iraq, Lebanon, Palestine, Guyana, Trinidad and Tobago
Certify vision for occupations	France, Singapore, Iraq, Jordan, Lebanon, Palestine
<b>Domain Three – Ocular Health Assessment and Management</b>	
Assessment of suitability for refractive surgery	Argentina, France, Ethiopia, Iraq, Jordan, Lebanon, Colombia, Guyana, Mexico
Advice on refractive surgery	Argentina, France, Iraq, Guyana, Mexico
Detecting ocular pathology	Iraq, Lebanon
Using diagnostic drugs	Singapore, France, Portugal, Malaysia, Iraq, Lebanon, Palestine, Saudi Arabia
Contact tonometry	Argentina, Singapore, France, Portugal
Gonioscopy	Argentina, Singapore, France, Portugal, Malaysia, Ethiopia
Posterior segment assessment	Argentina, France
Direct Ophthalmoscopy	Argentina, France
Indirect Ophthalmoscopy	Argentina, France
Slit lamp biomicroscopy	Argentina, France
Perimetry	Argentina, France
Optical Coherence Tomography	Argentina, France
Retinal imaging	Argentina, France, Ethiopia, Kenya, South Africa
Ocular biometry	Argentina
Punctal plugs	France, Singapore, Nepal, Malaysia, Uganda, Zimbabwe, Iraq, Iran, Lebanon, Palestine, Jordan, Saudi Arabia, Colombia, Guyana, Jamaica
Prescribe/recommend over the counter lubricants	Argentina, Nepal, Iraq
Therapeutic management	Argentina, France, Philippines, Hong Kong, Iraq, Iran, Lebanon, Palestine, Jordan, Trinidad and Tobago

**Notes:** \*WCO Competency Framework for Optometry. Saint Louis, Missouri: World Council of Optometry, 2024.

**Abbreviation:** WCO: World Council of Optometry.

strabismus and amblyopia including orthoptics. The ocular health assessment and management domain has many of its elements prohibited by several countries. Use of diagnostic pharmaceutical agents is prohibited in the following countries: France, Iraq, Lebanon, Malaysia, Palestine, Portugal, Saudi Arabia, and Singapore. Optometric use of punctal plugs is prohibited in 38% of the countries, whereas biometry is prohibited by only one country (Argentina).

## Discussion

### Optometrist-to-Population Ratio

Access to eye care services faces numerous hurdles globally, impacting individuals' ability to receive equitable and affordable eye health services. One of the main factors leading to this is the worldwide shortage of the eyecare workforce, including optometrists and ophthalmologists.<sup>5,12</sup> The optometrist-to-population ratio varies significantly worldwide which could be attributed to differences in healthcare infrastructure, economic development, population density, and regulatory framework.<sup>5</sup> Less than half of the countries surveyed met the observed ratio of one optometrist to 10,000 persons.<sup>4</sup> Optometry services are more prevalent in economically developed countries where there is greater investment in healthcare infrastructure and education. Countries with higher GDP per capita tend to have lower optometrist-to-population ratios as they can afford to support training of optometrists and there are wider employment opportunities.<sup>5</sup> All the high-income countries surveyed in this study met or exceeded the observed 1:10,000 ratio.<sup>4</sup> The organization and funding of healthcare systems also play significant roles. Countries with universal healthcare coverage often have better access to optometry services, leading to lower ratios. In contrast, countries with privatized healthcare systems or limited government funding may have higher ratios due to disparities in access.<sup>13</sup>

Optometrist-to-population ratios can vary based on population density. Urban areas typically have more optometrists per capita compared to rural or remote regions where healthcare resources are scarcer.<sup>14</sup> This disparity, which is observed in both low-income and high-income countries, can result in significant challenges in accessing eye care services for individuals living in remote areas.<sup>14</sup> None of the Sub-Saharan African countries met the WHO 1:10,000 ratio as reported in literature.<sup>5</sup> It has been noted that the limited access to optometrists in sub-Saharan Africa may exacerbate the levels of vision impairment, given that cataract, uncorrected refractive errors, and glaucoma are the leading causes of vision impairment in many African countries.<sup>15</sup> The variation in optometrist to population ratios evidenced in the countries sampled in this study represents one aspect of the complex interplay of factors underpinning access to eye care services.

### Gender Distribution

Gender inequality in the eyecare workforce is a significant issue globally, where women are often underrepresented in ophthalmology, optometry, and opticianry.<sup>16</sup> Although, on average, 55% of the optometry workforce in the countries surveyed in this study identified as female, women represent only 37% of optometrists Sub-Saharan Africa. Only 20% of optometrists in Kenya identify as female compared to 70% in countries like Austria and Canada, which may reflect male-dominated societal norms.<sup>17</sup> Evidence shows that women may encounter biases and stereotypes from healthcare providers, leading to disparities in the quality of care they receive. Discriminatory practices may also manifest in the allocation of resources and funding for eyecare programmes and services.<sup>17</sup> This compounds the gender disparity in terms of vision impairment in many parts of the world, including Africa, where women are more likely to suffer from vision impairment more than men.<sup>15,18</sup>

The scope of practice for optometrists is typically regulated by government licensing bodies or professional associations, which establish standards for education, training, and practice.<sup>19</sup> However, optometry as a profession is not yet regulated in several countries, including India, one of the largest countries in the world in terms of population, where almost 25% of adults above the age of 50 years suffer from vision impairment.<sup>20</sup> The current study adopted the WCO Competency Framework for Optometry which was released in 2024,<sup>21</sup> as a basis for analyzing the scope of practice of optometrists globally.

### Refraction and Visual Function Assessment and Management

Refraction, a component of the process of determining a person's prescription for corrective lenses, is a core competency of optometric practice worldwide.<sup>5</sup> Most of the countries surveyed reported no or minimal restrictions in the refractive assessment and management domain. Around one quarter of the countries surveyed prohibit remote refraction. Limited research is available regarding the role of tele-health in optometric practice, with interest peaking during the coronavirus pandemic of 2019 (COVID-19) due to lockdowns.<sup>22</sup> In some countries, there is limited knowledge amongst practitioners about tele-optometry, and there are concerns about the accuracy of prescriptions offered.<sup>23</sup> With advancements in

technology, the role of optometry in tele-health including refraction will be reshaped.<sup>22</sup> In terms of the visual function and assessment domain, optometrists in France are prohibited from assessing and managing strabismus and amblyopia. Eye care delivery in France is a collaborative effort between ophthalmologists and orthoptists, where opticians, since optometry is not recognized as a profession, deal mainly with dispensing of glasses based on prescriptions issued by ophthalmologists.<sup>24</sup>

## Ocular Health Assessment and Management

In some countries, optometrists are authorized to perform a wide range of diagnostic and therapeutic procedures, including prescribing medications for certain eye conditions, managing ocular diseases, and providing pre- and post-operative care for refractive surgeries.<sup>25</sup> However, in other countries, optometrists have a more limited authority and may not be allowed to prescribe medications or treat certain conditions.<sup>26</sup> The most observed limitations in the optometry scope of practice in this study were within the ocular health assessment and management domain. It is of interest to note that the management of ocular conditions is a crucial part of the WCO concept of optometry, and in the competencies required by optometrists as per the WHO Eye Care Competency Framework document.<sup>27,28</sup> The World Report on Vision clearly highlights the role optometrists play in the prevention of vision impairment and the management of many of its causes.<sup>1</sup> Restricting the scope of optometrists may reduce the effectiveness of efforts to eliminate vision impairment globally, potentially affecting the quality of life of persons and possibly increasing the financial burden on individuals and healthcare systems.

## Continuing Education

Optometrists, like many other healthcare professionals, are often required to participate in continuing education programs to maintain their licensure/registration and stay abreast of advancements in their profession and health care generally. The nature and frequency of continuing education requirements vary by country and may influence the breadth of services optometrists are qualified to provide.<sup>29</sup> Limited studies are available on continuing education in the optometry profession. This study showed the broad spectrum of continuing education requirements and their implementation in the countries surveyed. This highlights the need to raise the current levels of practitioners through implementation of continuing education to ensure that their knowledge is always current.

## Strengths, Limitations, and Recommendations

Variations in optometric scope of practice globally reflect a combination of factors, including legal and regulatory frameworks, professional standards, and educational opportunities.<sup>5,8,26</sup> Understanding these variations is essential to ensure that optometrists can practice to the full extent of their training and expertise while meeting the eye care needs of diverse populations. Optometry practice, knowledge, and skills have expanded widely over the past decades. Practice opportunities also expanded beyond the typical optometry practices and clinical opportunities. The current study provided an opportunity to understand the current scope of practice, knowledge and skills in countries that were members of the World Council of Optometry.

The strength of this study lies the methodology of data collection which ensured the reliability of the results through non-random, purposive sampling coupled with a key informant strategy, where questionnaire responses were verified through oral interviews to ensure data accuracy. In addition, the questionnaire used was adapted from a version previously used by policy makers and stake holders.

The study is limited in that it represents the situation of countries that were members of the World Council of Optometry during the survey period. This restricts the wider generalization of study outcomes to the status of optometry in other parts of the world, as it reflects the situation in these member countries. Notwithstanding this, study outcomes apply to approximately 250,000 optometrists across 39 countries, and the diversity of the countries in terms of their geographic distribution supports the conclusions and recommendations.

Optometrists play a crucial role in early detection of eye diseases such as glaucoma and diabetic retinopathy. A shortage in personnel can limit access to early detection and diagnosis and preventive measures.<sup>1</sup> Early detection is essential for timely treatment and better prognoses. A lack of optometrists can lead to delayed diagnoses and potentially worsen eye conditions.<sup>1</sup>

A shortage of optometrists, observed in some countries surveyed in the current study, can hinder public health efforts to promote eye health and prevent vision loss.<sup>1</sup> Therefore, highly trained optometrists are crucial for addressing these healthcare needs.<sup>3,4</sup> This is especially important given the categories of people who need eyecare based on The Lancet Global Commission on Global Eye Health; persons with ongoing care needs, persons who have early-stage disease, and persons with symptomatic conditions that require service but do not cause vision impairment.<sup>30</sup> Optometrists can provide care to all patients' categories along with ophthalmologists, with each profession having its full scope of practice.<sup>30</sup>

## Conclusion

The study aimed to provide information on the demographics of optometrists in countries who were members of the World Council of Optometry during the period 2022–2023. In addition, the regulation of the profession and the scope of optometry practice were surveyed. There is an observed inequality in the distribution of optometrists especially in developing countries. Some countries do not recognize optometry as a profession. Even if optometry is recognized, many countries restrict the scope of optometry practice as defined by the competency domains detailed in the World Council of Optometry Competency Framework for Optometry, and the World Health Organization Eyecare Competency Framework. The results obtained from this study are expected to assist policy makers and stakeholders in fulfilling the World Health Organization's call for optometry services to provide people-centered eye care through evidence-based information. Also, inform the recently launched WHO SPECS 2030 initiative that envisions a world in which everyone who needs a refractive error intervention has access to quality, affordable and people-centered refractive error services.<sup>31</sup>

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## Disclosure

Yazan Gammoh is the chair of the Education committee of the World Council of Optometry (WCO). Priya Morjaria is the chair of WCO Public Health committee. Sandra Block is the 2023–2025 President of WCO. Peter Hendicott is the 2021–2023 President of WCO. The authors report no other conflicts of interest in this work.

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