Evaluating Eye Health Care Services Progress Towards VISION 2020 Goals in Gurage Zone, Ethiopia.

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Abstract

Background

Ethiopia signed the VISION 2020 Global Declaration and launched its eye health program in 2002. Since then, there has been limited systematic and comprehensive evaluation of the progress towards VISION 2020 goals in Ethiopia.

Purpose

To evaluate Gurage Zone progress towards VISION 2020 targets and process indicators.

Method An institutional-based cross-sectional study was conducted among all public and private eye health care facilities in the Gurage Zone within the Southern Nations, Nationalities, and People Region of Ethiopia. The evaluation protocol was adopted from the VISION 2020 situational analysis data collection tool. We used this structure to evaluate progress in terms of human resources, infrastructure, and service delivery at the Zonal Health Office and facility level.

Result

At the time of the study, the Gurage Zone had a 1.7 million catchment area population. There was a total of five eye care centers, of which one was established by a Non-Governmental Organization. Three of these facilities were secondary eye care centers with an operating theater and two of them were primary eye care centers. At the zonal level, there is no survey data available on the prevalence of blindness. There was no systemic evaluation of VISION 2020 process indicators. The budget allocation specific to eye health care was less than 0.7% of the total budget of the office. The human resources for eye health in the catchment area were: one ophthalmologist, two cataract surgeons, five optometrists, and 12 ophthalmic nurses, which is below the VISION 2020 targets for human resources for eye health. In terms of equipment, neither primary eye care center had a slit lamp biomicroscope, and two of the three secondary eye care centers did not have intraocular pressure (IOP) measuring equipment. Only one secondary eye care center was providing glaucoma surgical services, and no center provided either emergency or elective pediatric surgery. The cataract surgical rate (CSR) determined by the study was 1967.

Conclusion

Gurage Zone had not achieved VISION 2020 goals in terms of critical human resources and service delivery. We recommend that the Zonal Health Office carries out a focused and baseline evaluation of eye health care service achievements.

Introduction

The World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB) launched "VISION 2020: The Right to Sight" in 1999. The objectives are to eliminate avoidable blindness by 2020 and prevent a projected doubling of the burden of visual impairment between 1990 and 2020. The major causes of blindness are being targeted: cataract, trachoma, onchocerciasis, childhood blindness, and refractive error.¹

Because of population growth and aging, the number of blind and visually impaired people is increasing at an alarming rate. These observations highlight the importance of responding to WHO's Global Action Plan by scaling up current global, regional, and national efforts to eliminate the burden of avoidable blindness and vision impairment.²

Eye health promotion, prevention, treatment, and rehabilitation are all part of comprehensive eye care services. The integration of these services into national health systems is a critical prerequisite for achieving the VISION 2020 goals. To date, all 193 WHO member states have formally committed to investing in eye care, and the vast majority of countries have established VISION 2020 committees and developed national eye care plans. However, implementation of these plans varies greatly across countries and remains the most difficult challenge to achieving the set goals.¹

There are still large populations in Sub-Saharan Africa who have limited or no access to eye care. While progress has been made in some areas, there are lessons Ethiopia can learn from these accomplishments that will help it get closer to achieving the VISION 2020 goals. The VISION 2020 strategy specifies measurable objectives such as cataract prevalence reductions and process indicators. Human resources for eye health (HReH), practitioner per million population ratios, or the number of ophthalmologists per million people in a region are examples of process indicators.^{1 4 5}

In 2002, the Ethiopian government signed the VISION 2020 Global Declaration and launched its eye health program. The national strategic plan for blindness prevention prioritizes three key areas of activity: Controlling diseases that cause avoidable blindness; developing and deploying human resources for eye health delivery; and developing and strengthening infrastructure and appropriate technology for eye health.⁶

In this study, we evaluated eye health and progress towards VISION 2020 goals in terms of human resources, infrastructure, and service delivery in the Gurage Zone of the Southern Nations, Nationalities and People Region of Ethiopia (SNNPR).

Methods

We conducted a facility-based cross-sectional study using quantitative and qualitative methods in all eye care (ophthalmic) centers in the Gurage Zone as of May 2018. The Gurage Zone is located 158 kilometers south-west of Addis Ababa in the SNNPR in Ethiopia and has a total area of 5932 square kilometers. According to projections based on the 2007 population census by the Central Statistics

Agency (CSA), the total population is 1,713,076, of which 839,406 (49%) are males and 873,670 (51%) are females.⁷

The list of government and non-governmental organizations (NGO) health care facilities providing ophthalmic services was obtained from the Gurage Zone Health office. Upon visiting the facilities, contact persons were identified by the principal investigator.

A questionnaire was administered during face-to-face interviews with the eye clinic head. The questionnaire was adopted from the VISION 2020 situation analysis data collection tool and was divided into four sections, including general information, equipment, services, and human resources.^{8 9}

General information about the facilities included location, main sources of funding, catchment area population size, number of beds, availability of outreach services, and number of patients seen per year. For equipment, a list of items considered essential for a functional eye unit was derived based on the guidance by the International Agency for the Prevention of Blindness (IAPB).¹⁰ The objective was to assess how many pieces of equipment were available and whether they were considered to be in optimal working condition. Information on the types of eye health care services offered was collected, including refraction and spectacles dispensing, population screening, low vision services, and surgery for cataract, trichiasis, and glaucoma. In the last section of the questionnaire, participants were asked to list the number of human resources for eye health available by role, including information on their nationality, gender, place of training, and years of practice.

Eye care service management in the Gurage Zone was evaluated using parameters of condition management, stakeholder relationships, policy and regulation, and financing.

The principal investigator conducted semi-structured interviews with an ophthalmologist, administrators, government officials, and other people working in eye health care to assess the current situation in the Gurage Zone. These respondents were asked about strengths and weaknesses of the system, policy suggestions and visions for the future.

All qualifying ophthalmic centers which were operational during the study period were included in the study. Health care facilities without trained eye care professionals and or ophthalmic centers which were not functional during the study period were excluded.

Targets and process indicators based on VISION 2020 goals were calculated for the Gurage Zone based on WHO expert group recommendations for Sub-Saharan Africa established in 1997 (Table 1). The practitioner per population ratio was calculated and compared with their respective VISION 2020 targets.

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Operational definitions

Primary eye care comprises prevention and non-surgical treatment of the most common eye conditions and referral for most surgical and advanced treatments (such as cataract and glaucoma surgery).

Secondary eye care comprises primary eye care services plus surgical services for the most common eye conditions, such as cataract and glaucoma.

Tertiary eye service comprises all subspecialty eye care services, including advanced diagnostic, medical, and surgical treatment for both children and adults.

Table 1: VISION 2020 process indicators and targets per 1 million populations for Ethiopia

VISION 2020 process indicators and targets per 1000000 population and actual numbers		
	VISION 2020 Standard	Actual Finding
Ophthalmologist	4	1
Cataract surgeon	4	2
Ophthalmic- clinical officer (OCN)	10	0
Ophthalmic-nurses (ON)	10	12
Optometrists	20	5
Mid-level refractions	20	0
Cataract surgery performed per 1,000,000 population per year	2000	1967
Cataract surgeries performed per surgeon	500	-

Results

The health system profile of Gurage Zone in 2018 had a total of 71 health facilities, of which 64 (90.1%) were public and 7 (9.9%) were NGO. Five hospitals were primary hospitals and one was a secondary hospital. In the Gurage Zone, only 5 (7%) facilities provided eye care services.

There has been no survey conducted on the prevalence and causes of blindness specifically by the Gurage Zonal Health Bureau. Instead, there were Zonal Health Office reports indicating that cataract and trachoma were the top causes of blinding disease. A focal person was assigned to the zonal office in the neglected tropical diseases division to focus on eye health and prevention of blindness. The focal person was aware of the VISION 2020 program. However, there was no VISION 2020 committee established at the zonal level and therefore there were no previous systematic evaluations of eye care services according to VISION 2020 in Gurage Zone.

Orbis and Christian Blind Mission (CBM) were the main partners of the zone health bureau supporting a trachoma prevention and treatment program. Partner support included finance, training, and program

evaluation. The partners made progress and played a crucial role in combating trachoma in the Guarage Zone. There was no comprehensive eye care service regulation program based on written protocol and code of conduct.¹¹ Despite the absence of a regulated comprehensive eye care service system, the zone conducts an evaluation of the prevalence and management of active trachoma, as well as an assessment of the availability of Trachomatous Trichiasis (TT) surgical coverage, every three years.

The budget of the zonal office in 2018 specifically allocated for eye care services was 0.69% of the annual capital budget. It was mainly allocated for the TT program. There was no budget allocation for medical equipment and technology transfer. The budget support from partners was a hundred times higher than the government's budget allocation. The strongest secondary eye care unit (SECU) in the zone was the one that had an ophthalmologist and was supported by a partner in terms of finance, equipment fulfillment, and management. Despite regular trachoma activities and cataract monitoring, there were no eye health promotion activities and no national eye care quality standard controlling mechanism at this zonal level.

Eye care centers

Five (7%) of the health facilities in the zone provided eye care, three of which are health centers and two of which were district hospitals. Of these five facilities, two were equipped as primary eye care centers and three were secondary eye care centers, but no tertiary eye care center exists. These five facilities saw 118,900 patients in the 2017/2018 budget year. On average, the facilities had been open for 11.4 years. The first eye care center in the zone was established in 1995 and the rest were established after the launch of VISION 2020. All the eye care centers were supported by government and non-governmental organization (NGO) funding and planning. The government provided 80% of the funding, with NGOs providing the remaining 20%. Orbis, CBM, and Light for the World were the NGOs supporting the centers. Only one secondary eye care center had inpatient care with 60 beds, which made the inpatient bed to population ratio 1:28,550. Outreach services were provided by all but one of the eye care centers, and those services included cataract surgery, trachomatous trichiasis (TT) surgery, and refraction.

There were only two primary eye care units (PECU) for a catchment area of more than 1.7 million people. This was by far below the recommended number of primary eye care centers for this catchment area. The numbers of PECU and SECU per million populations at the zonal level were 1.2 and 1.75, respectively. The overall fulfillment of PECU and SECU as per the national standard which was adopted from VISION 2020 in terms of human resources, services, and equipment was 42.8% and 55.5%, respectively (Figure 1).

Human Resource

Of the 3,700 health care providers in the Guarage Zone, there were 23 eye care workers (0.62%), of whom 16 (69.5%) were males and 7 (30.5%) were females, giving a male to female ratio of 2.3:1. There was one ophthalmologist (0.15:250,000) who was working in an NGO hospital, 3 cataract surgeons (0.4:250,000) (1 working in an NGO hospital), 5 optometrists (0.17:50,000) (3 working in an NGO hospital), and allied eye health professionals (0.7:100,000) (1 ophthalmic clinical officer and 5 ophthalmic nurses working in

an NGO hospital). There was no specific eye health human resources strategic plan prepared or implemented at the zonal level. There has been an increasing trend in the number of TT surgeons over the past five years. There were a total of 3 ophthalmic nurses who were practicing in primary eye care centers and one ophthalmologist, 3 cataract surgeons, 5 optometrists, and 9 ophthalmic nurses were practicing in secondary eye care centers.

All eye health care workers were Ethiopians who were trained in Ethiopia. The places of training were: Gonder University, Quiha Hospital, Addis Ababa University, Jimma University, Alert Hospital, Yirgalem Hospital, and Hawassa University. One maintenance technician was trained in India. On average, the healthcare workers had 10.4 years of experience, with a range of one to twenty-three years of practice. The monthly salary of the staff ranged from \$160 USD to \$1805 USD.

The available human resource for eye care at zonal level was below the target of the VISION 2020 process indicators across all professions. The number of ophthalmologists and optometrists was critically low. The ratios for ophthalmologists and optometrists were 0.15:250,000 and 0.35:100,000, respectively (Table 2).

Table 2: Comparison of eye care personnel working in Gurage Zone and the VISION 2020 recommendation May, 2018

Profession	Number of Practitioners	VISION2020 Target for Number of Practitioners	Deficit	Need Met/Unmet
Ophthalmologist	1	7	6	Unmet
Cataract surgeon	3	7	4	Unmet
All surgeons	4	7	3	Unmet
Ophthalmic clinical officers (OCO) and nurses (ON)	12	17	5	Unmet
Optometrist	5	17	12	Unmet
Manager	1	2	1	Unmet
Technician	1	3	2	Unmet

At the national level, the number of professionals per million population was comparable with zonal status, but below VISION 2020 targets (Figure 2).

Equipment

Equipment fulfillment in PECU was 20% as per national standards and for SECU it was 70.4%. Of all the available equipment in the facilities, 82% was functional, 9.8% needed repair, and 8.2% was beyond repair. (Figure 3) Both primary eye care centers didn't have a slit lamp biomicroscope, and except for one

secondary eye care center, all did not have IOP measuring equipment. Only one center had a maintenance technician. (Table 3)

Table 3: The number of equipment and the number of eye care centers with equipment in Gurage Zone Ethiopia, 2018

Equipment	Gov. Eye Care Unit (n=4)		NGO (n=1)	Total (n=5)	
	Equipment (n)	Unit (n, %)	Equipment (n)	Equipment (n)	Unit (n, %)
Loupe	4	2 (50%)	2	6	3 (60%)
SLM	4	2(50%)	3	7	3(60%)
Applanation Tonometer	0	0	3	3	1(20%)
Direct Ophthalmoscope	4	4(100%)	10	14	5(100%)
Indirect Ophthalmoscope	0	0	1	1	1(20%)
Trial Lens Set	6	3(75%)	4	10	4(80%)
Trial Frame	3	1(25%)	4	7	2(40%)
Cross Cylinder	1	1(25%)	4	5	2(40%)
A Scan	2	2(50%)	2	4	3(60%)
B Scan	0	0	0	0	0
Operating Microscope	3	2(50%)	3	6	3(60%)
YAG Laser	0	0	0	0	0
Cataract set	19	2(50%)	10	29	3(60%)

Services

There were five eye care centers, of which three were secondary eye care centers. Sixty percent were providing school screening, refraction services and cataract surgery. All the SECUs had operating theaters. Only one center provided inpatient care, low vision, and glaucoma surgery services. TT surgery was provided in all eye care centers. No SECU provided elective and emergency pediatric surgery, vitreo-retinal surgery, pan retinal photocoagulation, YAG capsulotomy or exenteration services.

Cataract Surgery

The total number of cataract surgeries performed in the previous calendar year was 3,373, including cataract surgery performed at outreach. From these, 2163 (64.2%) surgeries were done at the base unit and 1210 (35.8%) were done at outreach surgery. The cataract surgical rate (CSR) was 1,967. There was

no data for calculating cataract surgical coverage (CSC). The average waiting period to receive cataract surgery was 12 days. The IOL implantation rate was 95%. All the centers had quality control mechanisms for cataract surgery outcomes, which were the IOL implantation rate, outcome tally, and complication auditing system. The zonal CSR and cataract surgery per surgeon (CSPS) were compared with the national level and VISION 2020 targets (Figure4).

Refraction

In the Gurage zone, only secondary eye care centers provide refraction services. Two out of the three secondary eye care centers had optical workshops, but only one was functional. Neither primary eye care center offered refraction services. Pediatric refraction and cycloplegic (retinoscope) refraction were available only in one of the SECUs. All secondary eye care centers had services for glass prescriptions in their compound, but only one had pediatric glass prescription services.

Discussion

This is the first study to be conducted in Ethiopia at zonal level. We assessed progress toward Vision 2020 goals in terms of health system management, eye health care service delivery, eye health human resources, and infrastructures.

The zonal health bureau did not establish a VISION 2020 committee, which is one of the top priorities for managing and evaluating eye health. There was a national VISION 2020 committee but the cascading did not reach the zone. IAPB and WHO recommended the implementation of VISION 2020, which should be planned at the district level.¹²

The budget allocation specific to the eye health services was 0.69% of the total annual capital zonal budget. While partners, particularly Orbis and CBM, supported more than 72% of the annual budget of the zone for eye care service improvement. CBM was supporting one SECU, in terms of finance, equipment fulfillment and management. The strongest SECU in the zone was the one which was supported by CBM. This showed that government priority for eye health was not sufficient.

The number of health facilities providing eye care was only 7%. This showed poor integration of eye health care services within the existing health system. This was a failure in one of the three main national strategic plans drafted in 2006. Overall, in terms of available human resources and equipment fulfillment at the facility level, SECU and PECU achieved 55.5% and 42.8%, respectively.

The human resource for eye health in the zone was critically low. All types of professionals were below the target of VISION 2020. There was only one ophthalmologist (0.15:250,000) in the zone. This finding goes with most Sub-Saharan African countries, according to a study conducted by Palmer et al in 16 sub-Saharan countries.¹³ The number of optometrists was also very low. It was 0.17:50,000 population. In their study, Palmer et al. evaluated that all sub-Saharan countries will not achieve the VISION 2020

targets by 2020. Ethiopia is currently half-way to meeting VISION 2020 target. At the current increasing eye care practitioners' growth rate, it is projected to be met by 2034.^{13 14}

Equipment fulfillment in both PECU and SECU as per national standards for eye care services was 20% and 70.44%, respectively. The emphasis given to PECU in terms of infrastructure, integration, and human resources was so shocking that it did not fulfill at least 50% of the national standards. The SECU was not providing elective pediatric and vitreo-retinal surgery. It was because of a lack of the necessary equipment and trained personnel.

There were a total of 3,373 cataract surgeries performed in the previous year. Sixty-four percent were done on a regular basis, while 35.8% were done during outreach campaigns. The CSR was 1967, which corresponded to the Vision 2020 target of 2000. But the number of surgeries performed on an outreach basis was high. This might affect the progress in achieving stable CSR in the future. Refraction services were provided in all SECUs. But none of the PECUs provide the service. This finding was against the national standard in which refraction service is one of the important activities of PECU.

Conclusion

The Gurage Zone had achieved minimal in terms of human resources for eye health, which was very critical. The number of primary and secondary eye care units was below the Vision 2020 targets. It showed that the Gurage zone needs to do a lot to achieve the VISION 2020 program.

Recommendation

The Zonal Health Office is recommended to conduct a focused and baseline evaluation of eye health care service achievements and needs to expand the number of eye care centers, especially primary eye care units and human resources for eye health. We also recommend that the Ministry of Health conduct a national eye care service evaluation.

Declarations

Ethical Approval and Consent to Participate

The research proposal was approved by the Department of Ophthalmology Research and Ethical Committee at Addis Ababa University. Permission was obtained from the Gurage Zone Health Bureau. All protocols are carried out in accordance with relevant guidelines and regulations. Participants were aware of the study and understood the benefits and risks involved. Informed consent was obtained from all heads of the eye care centers.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

No competing interest.

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Authors' contributions

JGS contributed to conception, design, acquisition, analysis, and interpretation of data and drafted and wrote the article.

TT contributed to conception, design, drafting, and revising the article for publication.

OS contributed to reviewing and editing the article critically for important intellectual content and publication.

AC contributed to reviewing and editing the article for publication.

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Conflict of interest

The authors declare that there are no conflicts of interest.

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Figures

Figure 1

Map of the Gurage Zone, SNNPR, Ethiopia.

Figure 2

Number of Eye care centers, comparison between National and Zonal Level per million populations, Gurage Zone Ethiopia 2018.

Figure 3

Comparison of human resources per million populations between zonal, national and VISION 2020 targets

Figure 4

Functional Status of Equipment available at Eye Care centers in Gurage Zone Ethiopia, 2018

Figure 5

CSR and cataract surgery per surgeon comparison between Zonal, National, and VISION 2020 targets in Gurage Zone Ethiopia, 2018

Supplementary Files

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