



Analysis of Human Resources for Eye Health in Ogun State of Nigeria: Progress towards Vision 2020

T. J. Bogunjoko^{1*}, A. O. Hassan¹, T. B. Akanbi¹, A. S. Ashaye¹
and A. A. Akinye¹

¹Eye Foundation Centre for the Prevention of Blindness, Ilese-Ijebu-Imushin, Ogun State, Nigeria.

Authors' contributions

This work was done in collaboration among all authors. Author TJB designed the study, analysed the data and wrote the article. Author AOH conceived and helped in the design of the study. Author AAA controlled the quality of the data and proofed the article. Authors TBA and ASA helped in the design. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To conduct a situational analysis of human resources for eye health (HReH) and assess its progress towards vision 2020 goals in Ogun state of Nigeria.

Study Design: A descriptive cross-sectional study.

Place and Duration of Study: 21 eye care facilities in Ogun state between November and December 2014.

Methodology: Data was collected with an adapted questionnaire developed by WHO and IAPB. The questionnaire was filled by telephone interview to key officials of registration boards for ophthalmologists, optometrists and ophthalmic nurses and public and private institutions employing these professionals in the state. Sources of population data was from census, state website and estimated rate of annual population. Each of these targets graded to show if vision 2020 target was met in 2014.

Results: There were 21 eye care facilities in Ogun state. 7 (33%) are government owned, 2 (9.5%)

*Corresponding author: E-mail: tayo.bogunjoko@eyefoundationhospital.com;

are non-governmental organization (NGO)/mission owned and 12 (57.2%) are private for profit. There were 77 eye care workers in active service made up of 27 ophthalmologists, 31 ophthalmic nurses and 19 optometrists in 2014. Most eye care workers in Ogun state work in government establishments (66%), 26% in private for profit and 7.8% in NGO/mission. Vision 2020 targets had only been achieved for ophthalmologists in 2014. The Ogun state ratio for ophthalmologist was 5.4 per million populations, 3.8 for optometrists and 6.3 for ophthalmic nurses. The percentage of each of the eye care workers average 25% in the capital city and 75% outside capital. Practitioner per million population specific for capital and outside capital is worse outside capital city.

Conclusion: The HReH was above the vision 2020 target for ophthalmologists. The ophthalmic nurses are above average and optometrists very low. There is need for a targeted investment for these two categories of practitioners and the need to address maldistribution of eye care workers.

Keywords: Human resources for eye health; vision 2020; ophthalmologists; optometrists; ophthalmic nurses; Ogun State.

1. INTRODUCTION

In the last 20 years, it has been known that human resources for eye health (HReH) are key to achieving substantial reduction in global and regional blindness and visual impairment. Vision

2020, the right to sight has as one of its three elements: the human resource development. It has suggested regional HReH targets which are thought to be needed for major reduction in avoidable visual impairment by the year 2020 [1-5].



Fig. 1. Map of Nigeria showing states of the federation
Source: Nigerian official website

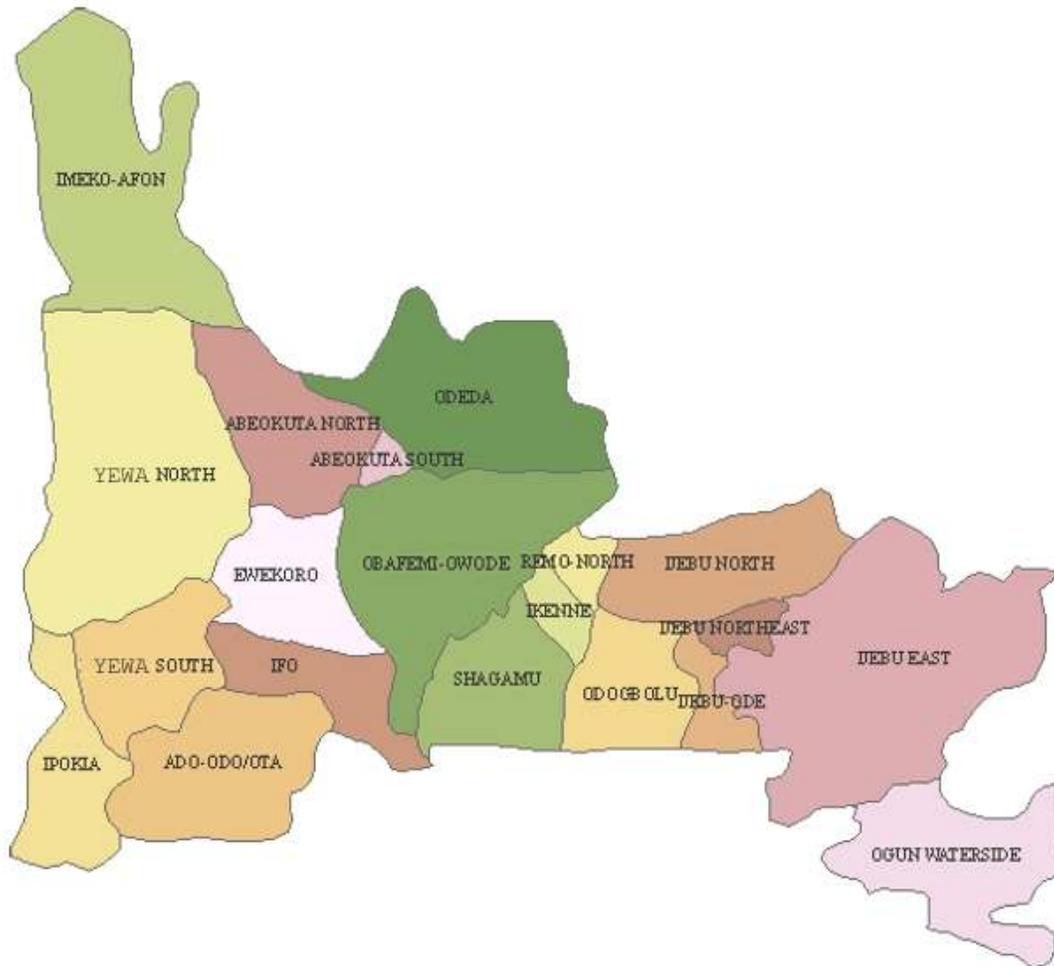


Fig. 2. Map of Ogun state showing 20 local governments that make up the state

Source: Ogun state official website

The global action plan (GAP) has the target to reduce prevalence of avoidable blindness and visual impairment by 25% by 2019 [3]. One of the key ways to do this is to have a strong and equitable eye health system to train and maintain more eye doctors, nurses and optometrists whose sizes and composition are proportionate to the eye care needs in a population [1,6-8]. There has been little information on HReH in sub-Saharan Africa especially Nigeria. From what is known, it is envisaged that vision 2020 programme goals may be difficult to attain [9,10].

Nigeria is one of the countries in West Africa made up of 178 million people (2014 estimated). It is made up of 36 states plus the federal capital territory Abuja. Ogun state is one of the 36 states

that make up Nigeria. It is located in the southwest zone of Nigeria with a population of 3.7 million (2006 national census). Estimated population for 2014 is 4,830,636. It is made up of 20 local government areas with headquarter in Abeokuta whose population in 2014 was estimated at 579,676. 45% of the population is urban while 55% is rural [11-15].

In Nigeria and Ogun state in particular, there has been deficit of information on workforce training, retention and distribution. Information on this and more will help develop appropriate and specific HReH strategies to meet the GAP target. The objectives of this study are to conduct a situational analysis of HReH and assess its progress towards vision 2020 goals in Ogun state of Nigeria.

2. MATERIALS AND METHODS

2.1 Design

The study was a descriptive cross-sectional study of all ophthalmologists, optometrists and ophthalmic nurses and public and private institutions employing these professionals in Ogun state. All the clinics and hospitals offering eye care services were approached from the record in the state ministry of health and professional bodies. Data was collected with an adapted questionnaire developed by World health organisation (WHO) and International agency for the prevention of blindness (IAPB) [9,10]. The questionnaire was filled by telephone interview to key officials of registration boards for ophthalmologists, optometrists and ophthalmic nurses and public and private institutions employing these professionals in the state on work entrance, active workforce and exit in the last 3 years including location and sector. The questionnaire was designed to collect information on three HReH cadres identified in VISION 2020 plans and appropriate to the Ogun state context: (i) Ophthalmologists (physicians (MD or MBBS) who specialize in the eye and visual system: DO, FWACS, FMCOPh, and FRCS), (ii) Optometrists (personnel with a BSc or doctor of optometry (OD) (normally four to six years of university education) (iii) Ophthalmic nurses (non-physician practitioners with post basic nursing (minimum one year) qualification in ophthalmology.

For all cadres in the active workforce, information on their location (capital city or outside capital) and type of employer (government, NGO/mission or private-for-profit) was collected.

Sources of population data was from census, state website and estimated rate of annual population of 3.18% [11,14]. Vision 2020 targeted HReH cadres: vision 2020 targets per 1,000,000 populations. Ophthalmologist: 4; Optometrist: 20 and ophthalmic nurses: 10 each of these targets was graded to show if vision 2020 target was met in 2014.

HReH workforce dynamics was calculated for practitioner per population ratios (PPPR)

- For overall population
- Compared with vision 2020 target
- Target number of practitioners
- Numbers of practitioners in the workforce
- Practitioners shortage

PPPR was calculated for those working in capital city and outside capital city. This shows the geographic distribution of eye care practitioners in Ogun state.

2.2 Data Management and Analysis

Data were collected and recorded in the questionnaire by TB (principal investigator) and a second researcher. All questionnaire data were reviewed by TB for consistency. HReH workforce dynamics was calculated for practitioner per population ratios (PPPR). PPPR was calculated for those working in capital city and outside capital city. These were compared with vision 2020 targets.

2.3 Ethical Consideration

This study was approved by the Olabisi Onabanjo University Teaching Hospital's Health Research Ethics Committee. All the participants provided written informed consent to participate in this study.

3. RESULTS

3.1 Ogun State Population Situation 2014

Estimated population of Ogun state in 2014: 4,830,636 [11].

Estimated population of (capital) Abeokuta in 2014: 579,676. [11,15] See Table 1.

3.2 Type of Eye Hospital/Clinics

There are 21 eye care facilities in Ogun state during this period of 2014. 7 (33%) are government owned, 2 (9.5%) are NGO/mission owned and 12 (57.2%) are private for profit.

Table 1. Population situation of Ogun state in 2014 & 2020

Year	Total population	Pop living in capital (Abeokuta)	% pop living in Abeokuta	Pop over 50 years of age	% pop over 50 years of age
2014	4,830,636	579,676	12%	483,063	10%
2020 (projected)	5,913,710	707,991	12%	650,508	11%

Table 2. Types of eye hospital/clinics

Type of eye hospital/clinics	Number	%
Government	7	33.3
NGO/Mission	2	9.5
Private for profit	12	57.2
Total	21	100

3.3 Characteristics of Eye Health Work Force by Sector in 2014

There are in active service 27 ophthalmologists, 31 ophthalmic nurses and 19 optometrists in 2014. On the whole most eye care workers in Ogun state work in government establishments (66%), 26% in private for profit and 7.8% in NGO/mission. For the ophthalmologists, 44.4% work in government establishments, followed by 33.3% in private for profit and 22.2% in NGO/mission. Ophthalmic nurses are 100% in government establishments while optometrists are 58% in the private for profit, and the rest 42% in government. None in non-governmental organization (NGO)/mission (Table 3).

3.4 Characteristics of Active Eye Care Practitioner Work Force within Ogun State: 2014

The percentage of each of the eye care workers average 25% in the capital city and 75% outside capital. Ophthalmologists 22% in capital, 78% outside capital, ophthalmic nurses: 26% capital, 74% outside capital. Optometrists: 26% capital, 74% outside capital. Note that rural populations are higher than urban populations within the state (See Table 4).

3.5 Eye Care Practitioner Work Force Dynamics: 2014

In terms of practitioner per million population specific for capital and outside capital, it is worse outside capital city. This is worst for optometrists (3.3/million) compared to 8.6/million for capital city (38.3%). For ophthalmologists, it is much better (4.9/million) to 10.3 (47.5%). For ophthalmic nurses 5.4 outside to 13.8 capital (39%) (See Table 5).

Table 3. Characteristics of active eye care practitioner work force by sector: 2014

Eye care cadre	Total active	Government	NGO/mission	Private for profit
Ophthalmologists	27	12 (44.4%)	6 (22.2%)	9 (33.3%)
Ophthalmic nurses	31	31 (100%)	-	-
Optometrists	19	8 (42.1%)	-	11 (57.9%)
Total	77	51 (66.2%)	6 (7.8%)	20 (26%)

Table 4. Distribution of eye care workforce within Ogun state

Eye care cadre	Total active	Capital	Outside capital	Training programme
Ophthalmologists	27	6 (22.2%)	21 (77.8%)	3
Ophthalmic nurses	31	8 (25.8%)	23 (74.2%)	
Optometrists	19	5 (26.3%)	14 (73.7%)	
Total	77	19 (24.7%)	58 (75.3%)	3

Table 5. Practitioner per million population specific for capital and outside capital

	No of practitioner in active service	Ogun state	capital	Outside capital	Vision 2020 target no of practitioner	Shortage in practitioner to meet the target
Ophthalmologist	27	5.5	10.3	4.9	20	Target met
Ophthalmic nurse	31	6.4	13.8	5.4	49	18
optometrist	19	3.9	8.6	3.3	100	81

As in Table 5: vision 2020 target number of practitioner is 20 for ophthalmologists where the target has already been exceeded. No shortage in practitioner to meet the target. For ophthalmic nurses 49, short of 18. Optometrists 100, short of 81.

3.6 Vision 2020 Targets for Eye Care Practitioners per Million Population

The Ogun state of Nigeria ratio for ophthalmologist is 5.5 per million populations, which means it exceeded the target of 4.0 in 2014 by 37.5%. For ophthalmic nurses, the state ratio is 6.3 per million populations which are 63% of the target of 10. Optometrist state ratio is the lowest, 3.8 per million populations, 19% of the target of 20 (Table 6).

3.7 Projected Situation: 2020

With the percentage projected population of 12% for Abeokuta, in 2020, the population will be about 707,991, not up to a million. The other parts of the state are the remaining 88% Table 1.

3.8 Projected Eye Care Practitioner Workforce Dynamics: 2020

In the last 3 years, 4 ophthalmologists exited and one for optometrist. 8 exited for ophthalmic nurses. Projected net change in 6 years (2020) is therefore more in the negative for ophthalmic nurses (-16) and -2 for optometrists and positively of 2 for ophthalmologist. Number of workforce projected is 29 for ophthalmologist, 15 for ophthalmic nurses and 17 for optometrists (Table 7).

Table 6. Eye care practitioners per million population

	Ophthalmologists	Ophthalmic nurses	Optometrists
Vision 2020 target	4	10	20
2014 situation in Ogun state	5.5	6.3	3.8

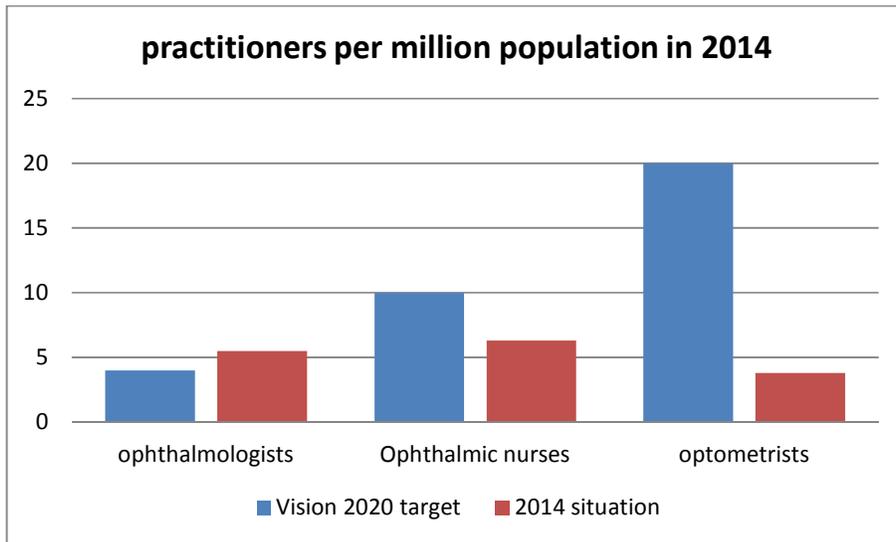


Fig. 3. Practitioners per million population in 2014

Table 7. Projected eye care practitioner workforce dynamics: 2020

Eye care cadre	Over last 3 years			Projected net change in 6 years	Projected no in active work force
	Active 2014	no entered work	No exited		
Ophthalmologist	27	4	3	2	29
Ophthalmic nurses	31		8	-16	15
optometrist	19		1	-2	17

4. DISCUSSION

4.1 Ogun State Population Situation

The estimated population of Ogun state of Nigeria in 2014 is 4,830,636 [10-14]. This is more than the population of some African countries like Botswana and Gambia and comparable to the population of countries like Sierra Leone and Togo [9,10].

4.2 Type of Eye Hospital/Clinics

In Ogun state, 33% of the eye care facilities are owed by government (Public), 57.2% private for profit and 9.5% NGO/mission. It must be noted that the government and the NGO/mission facilities are the main centres that do about 95% of cataract surgeries in the state [16]. They are majorly secondary and tertiary centres [16]. Those in the category of private for profit are mainly outpatient clinics owned by ophthalmologists, optometrists and ophthalmic nurses involved with mainly refraction for glasses and in a few cases surgery for cataract.

4.3 HReH Distribution in Ogun State and by Sector

For the fact that 33% of eye care facilities are owned by government, 66% of eye care workers in Ogun state work in government institutions, 26% in private for profit and 7.8% in NGO/mission.

4.3.1 Ophthalmologists

There are 27 ophthalmologists working in eye care facilities and majority of them (44%) work with government, 33% with private for profit and 22% with NGO/mission. Most of the doctors are with government because they feel more secured, in that they are rest assured of getting their salaries and it is a pensionable job. Some of the ophthalmologists own private clinics that they fall back on later in the day at close of work to attend to their private patients. The number of ophthalmologist in Ogun state of Nigeria is more than that of countries like Gambia and Botswana combined, and Sierra Leone too [9,10]. It is only Togo in that category that is nearer to Ogun with 22 ophthalmologists. There are no cataract surgeons in Nigeria, as compared to other countries earlier stated [9,10,17-19,20-21].

4.3.2 Ophthalmic nurses

All the 31 ophthalmic nurses work with government. A few of them are also owners of private eye clinics. The reason for all of them being in government is because most of them were trained by the government as ophthalmic nurses. So they are bound to go back and work for the government that trained them. It is the same reasons as those of ophthalmologists for security and guarantee of pension and gratuity. There are much more ophthalmic nurses in Botswana, Togo and Gambia [9,10,22].

4.3.3 Optometrists

There are few optometrists (19) and most of them work in private for profit (56%) mostly owned by them. The remaining 44% work with government. No optometrists work with NGO/mission. This is because government employ few of them, the rest find it easy to open clinics to practice as a last resort. There are some ophthalmic nurses that are trained as refractionists. They are very few and undocumented. They are not easy to trace. This problem of few optometrists is same with other countries in sub-Saharan Africa [9,10].

4.4 HReH Distribution within Ogun State

25% of each of the eye care worker work in the capital which is just 12% of the population of the entire state [15]. The remaining 75% work outside state capital. On a deeper look, practitioner per million population was surpassed in the capital for the ophthalmologists and the ophthalmic nurses (above the vision 2020 target). Optometrists are far below the vision 2020 target. Therefore, for the ophthalmologists and the ophthalmic nurses, they are oversupplied with eye care workers to the detriment of the rest of the state. There is maldistribution of the eye care workers. The major eye care facilities in the state are well divided in the 4 divisions in the state but they are situated in urban centres, only 2 of them are in rural areas (NGO and private for profit) [16]. This is same with other countries in sub-Saharan Africa [23,9,10]. As stated above, most of the workers want to work in capital cities and other urban areas because that is where there are infrastructural facilities like public power supplies, pipe borne water, and equipment to work with, the hospital themselves are located in urban centres [24,25,26,20,21].

4.5 Vision 2020 Targets

Ogun state surpassed the vision 2020 target for ophthalmologists in 2014 by 37.5%. Ophthalmic nurses are 65% in to it. Optometrists below 19%. The optometrists have a shortage in practitioner of 81 to meet the target of vision 2020. Ophthalmic nurses 18. The projected number of ophthalmologists in active workforce will surpass the vision 2020 target of 20. The optometrists and the ophthalmic nurses will not be able to meet the target unless adequate measures are taken to bridge the gap. This is same with countries like Gambia and Botswana that have already met the target for ophthalmologists and ophthalmic nurse except that Nigeria is yet to as per ophthalmic nurses [9,10,22].

5. LIMITATIONS OF THIS STUDY

1. Other mid-level ophthalmic personnel like the community ophthalmic technicians, community ophthalmic nurses trained by one of the major eye hospitals and a few general nurses working in the eye hospitals/clinics in Ogun state were not taken into consideration in this study.
2. Equally, no record about refractionists, they mostly practice in unregistered eye clinics.

6. CONCLUSION

Majority of eye care workers work in government institutions. Practitioner per million population was surpassed in the capital for the ophthalmologists and the ophthalmic nurses. Optometrists are far below the vision 2020 target. There is maldistribution of the eye care workers. Ogun state surpassed the vision 2020 target for ophthalmologists. There is need for a targeted investment for optometrists and ophthalmic nurses to address the shortages and the maldistribution of eye care workers between urban and rural population if the aim of vision 2020 is to be met in Ogun state of Nigeria.

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COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Pakistan Institute of Community Ophthalmology V2020. Global human resource development assessment for comprehensive eye care. Vision 2020 Human Resources Development Working Group, Pakistan. Available:http://www.iapb.org/sites/iapb.org/files/Global_HR_Development_Assessment.pdf
2. Vision 2020. Global initiative for the elimination of avoidable blindness: Action plan 2006 to 2011. WHO; 2007. Available:http://www.who.int/blindness/Vision2020_report.pdf
3. World Health Organisation. Universal eye health: A global action plan 2014 -2019. World Health Organization; 2013. Available:<http://www.who.int/blindness/actionplan/en/>
4. World Health Organisation. Global initiative for the elimination of avoidable blindness. World Health Organization; 1997. Available:http://whqlibdoc.who.int/hq/1997/WHO_PBL_97.61_Rev.1.pdf
5. World Health Assembly. Prevention of avoidable blindness and visual impairment: Report by the secretaria. World Health Assembly 59th Session, Provisional Agenda 11.7; 2006. Available:<http://apps.who.int/iris/handle/10665/21095> webcite
6. The international agency for the prevention of blindness. What is global action plan? Available:www.iapb.org/advocacy/who-action-plan/focus-challenges
7. Resnikoff S, Felch W, Gauthier TM, Spivey B. The number of ophthalmologists in practice and training worldwide: A growing gap despite more than 200,000 practitioners. Br J Ophthalmol. 2012;96(6): 783-787. PubMed Abstract | Publisher Full Text
8. Available:[IAPB-Africa HREH-Strategic-Plan_2014-2023.pdf](http://www.iapb.org/advocacy/who-action-plan/focus-challenges)
9. Palmer JJ, Chinanayi F, Gilbert A, Pillay D, Fox S, Jaggernath J, Naidoo K, Graham R, Patel D, Blanchet K. Mapping human resources for eye health in 21 countries of sub-Saharan Africa: Current progress

- towards VISION 2020. Human Resources for Health. 2014;12:44.
10. Palmer JJ, et al. Trends and implications for achieving VISION 2020 human resources for eye health targets in 16 countries of sub-Saharan Africa by the year 2020. Human Resources for Health. 2014;12:45.
 11. The official website of Ogun state, Nigeria. Available:www.ogunstate.gov.ng/population-figures
 12. Nigeria 2006 census figure (population). Available:www.nigeriamasterweb.com/Nigeria06censusng
 13. Available:www.tradingeconomics.com/National bureau of statistics
 14. National Population Commission website.
 15. United Nations, Department of Economic and Social Affairs, Population Division. World Urbanization Prospects: The 2014 Revision, CD-ROM Edition; 2014.
 16. Bogunjoko TJ. Knowledge, attitude and practices among medical officers and diabetic patients regarding diabetic retinopathy in Ogun state of Nigeria. Journal of Ophthalmology of Eastern Central and Southern Africa; 2016.
 17. Lewallen S, Etya'ale D, Kello AB, Courtright P. Non-physician cataract surgeons in sub-Saharan Africa: Situation analysis. Tropical Medicine & International Health, TM & IH; 2012.
 18. Courtright P, Ndegwa L, Msosa J, Banzi J. Use of our existing eye care human resources: Assessment of the productivity of cataract surgeons trained in eastern Africa. Arch Ophthalmol. 2007;125(5):684-687. PubMed Abstract | Publisher Full Text OpenURL
 19. Courtright P, Mathenge W, Kello AB, Cook C, Kalua K, Lewallen S. Setting targets for human resources for eye health in sub-Saharan Africa: What evidence should be used? Human Resources for Health. 2016;14:11.
 20. Adepoju FG, Ayanniyi AA, Pam V, Akanbi TB. Human resource development for VISION 2020 in developing countries: A change from absolute numbers. Eur J Ophthalmol. 2011;21:820–5.
 21. Adepoju AA, Patel D, Ayanniyi AA, Adekoya BJ, Omolase CO, Monsudi KF. Cataract surgical services in Kwara State, Nigeria. British Journal of Medicine & Medical Research. 2014;4(20):3743-3754.
 22. Molao C. Situation analysis of ophthalmic nursing services in Botswana. London School of Hygiene and Tropical Medicine; 2010.
 23. Eze BI, Ferdinand Maduka-Okafor C. An assessment of the eye care workforce in Enugu State, south-eastern Nigeria. Human Resources for Health. 2009;7:38.
 24. Bozzani FM, Griffiths UK, Blanchet K, Schmidt E. Health systems analysis of eye care services in Zambia: Evaluating progress towards VISION 2020 goals. BMC Health Services Research. 2014; 14:94.
 25. Lemiere C, Herbst C, Jahanshahi N, Smith E, Soucat A. Reducing geographical imbalances of health workers in sub-Saharan Africa: A labour market prospective on what works, what does not, and why. In The World Bank: Washington, DC; 2010.
 26. Rabi MM, Kyari F, Ezelum C, Elhassan E, Sanda S, Murthy GV, et al. Review of the publications of the Nigeria national blindness survey: Methodology, prevalence, causes of blindness and visual impairment and outcome of cataract surgery. Ann Afr Med. 2012;11:125-30.

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