

## EVALUATING CATARACT SURGERY NUMBERS AND CONSTRAINTS TO THE DELIVERY OF OPTIMAL CATARACT SERVICES IN KEBBI STATE, NIGERIA

Monsudi KF<sup>1</sup>, Allen F<sup>2</sup>, Ayanniyi AA<sup>3</sup>

<sup>1</sup>Monsudi KF, Department of Ophthalmology, Federal Medical Centre, Birnin Kebbi, Kebbi State. Phone +2348027938305, E-mail kfmshood@yahoo.com

<sup>2</sup>Allen F, London School of Hygiene and Tropical Medicine, Keppel Street London. Phone +442079588345, E-mail allenfoster@lshtm.ac.uk

<sup>3</sup>Ayanniyi AA, Department of Ophthalmology, College of Health Science, University of Abuja, Nigeria. Phone +2347063101502, E-mail ayanniyikabir@yahoo.com

### Corresponding author:

Monsudi KF, Phone: +2348027938305, Email: kfmshood@yahoo.com

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### ABSTRACT

**Background:** Despite cataract being the commonest cause of blindness globally the surgical services to tackle the scourge remain sub-optimal in the sub-Saharan Africa. Regular appraisal of cataract services is necessary to meet WHO Vision 2020 Cataract Surgical Rate (CSR) target for the African sub-region.

**Aim:** To evaluate the cataract surgery numbers and constraints to the delivery of optimal cataract services in Kebbi, Nigeria.

**Methods:** A descriptive and analytic cross-sectional study involving all the hospitals offering cataract surgical services in Kebbi using quantitative questionnaire to obtain a four-year-period (2012-15) information among others number of cataract surgeries performed and constraints in the delivery of cataract services.

**Results:** Cataract Surgical Rate was highest in 2015 with 567. The state hospital with lesser yearly budget performed more surgeries in the reviewed four-year-period compared to the tertiary hospital. The major barriers to the demand for cataract services were poverty, distance to eye clinic, fear of surgery, lack of awareness, cultural belief, ignorance, cost of surgery, long waiting hours and the elongated list of patient awaiting surgery.

**Conclusion:** Cataract Surgical Rate still remains low in Kebbi, and below WHO recommended minimal target for Africa. State hospital is the major contributor to the output in cataract service. The causation of the low demand for cataract services includes among others long waiting list at the state hospital, high cost of surgery at the tertiary and private hospitals. The need for all stakeholders in eye care in Kebbi to work together for improvement of the service delivery is underscored.

### INTRODUCTION

Worldwide, the commonest causes of visual impairment are uncorrected refractive error (43%) and cataract (33%). Other causes include age related macular degeneration (2%), glaucoma (2%), diabetic retinopathy (1%), trachoma (1%), corneal pathology (1%) and a large number of undetermined causes (18%)<sup>1</sup>. However, a study by an expert group as part of Global Burden of Disease (GBD) reported 223.4 million visual impairment globally of whom 32.4 million were blind and 191 million were moderate and severe visual impairment (MSVI)<sup>2</sup>. Ninety percent of visual impairment are in developing countries. Meanwhile, 80% of all cases of visual impairment are preventable or treatable<sup>1</sup>. More than half of the world's visually impaired population were in China, India, Indonesia, Nigeria and Pakistan<sup>2</sup>. However, cataract still remains the commonest cause of blindness worldwide, accounting for half (51%) of all cases of blindness, followed distantly by glaucoma (8%), age related macular degeneration (5%), childhood blindness (4%), corneal opacities (4%), uncorrected refractive errors (3%), trachoma (3%), diabetic retinopathy (1%) and undetermined causes (21%)<sup>1</sup>.

In the continent of Africa, cataract accounts for an estimated half of the seven million blind people<sup>3</sup>. It's

the most common cause of blindness in Nigeria<sup>4</sup> accounting for 42.9% of all cases of blindness in individuals above 40 years of age<sup>4</sup>.

### Kebbi State

Kebbi State was created in 1991 from the old Sokoto state and one of the 36 States in Nigeria. It is located in the North-western part of Nigeria between latitude 10° N and 13° N as well as longitude 3° E and 6° E. It is bordered in the north by Sokoto State, to the east by Sokoto and Zamfara States, to the south by Niger State, and to the west by Benin and Niger Republics (Figure 1). According to Nigerian population census in 2006, the state was inhabited by 3,256,541 people<sup>6</sup> with a land mass of 36,229 square kilometres, mainly tropical savannah vegetation. There are 21 Local Government Areas (LGAs) with 4 emirate councils.

Birnin Kebbi town is the capital of Kebbi State and also the headquarters of Birnin Kebbi LGA. It has a population of 113,688 people<sup>6</sup>. The residents are from various ethnic groups including Hausa, Fulani, Dakarkari, Gungawa and others. The main religion is Islam then, Christianity. The major occupations within Birnin Kebbi include trading, civil service (white and blue collar jobs), artisans and farming<sup>5</sup>.

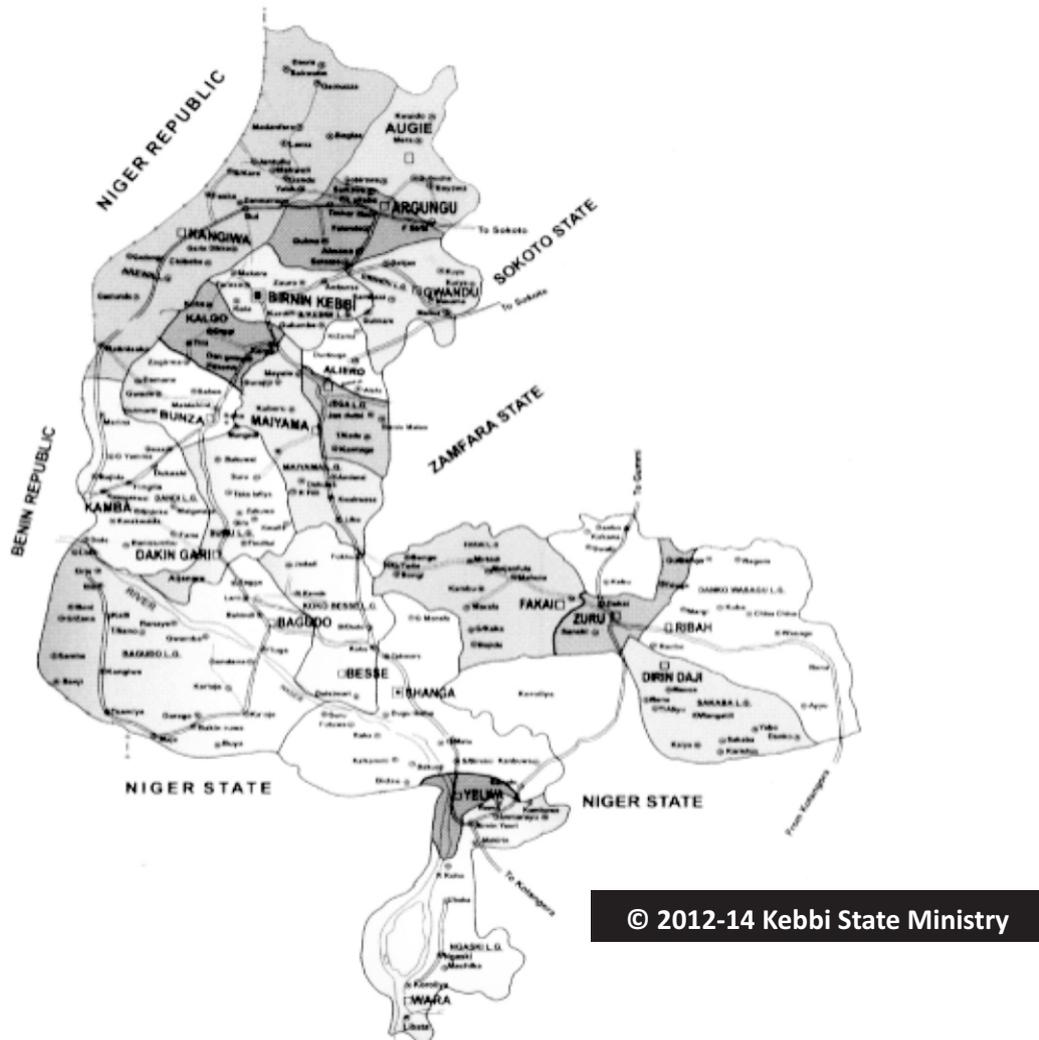


Figure1: Kebbi State map shown neighbouring states and countries

### Eye care services in Kebbi state

Eye care services are provided by Federal Medical Centre (FMC), a tertiary hospital, Birnin Kebbi; Hafsat Eye Clinic (HEC), a specialist hospital (formerly Sir Yahaya Memorial hospital) Birnin Kebbi, 4 private hospitals and 25 general hospitals which are distributed across the state (Table 1). However, only FMC, Hafsat Eye Clinic and Royal Balm Eye Clinic (RBEC) offer cataract surgical services. Figure 2 depicts the 3 hospitals offering cataract surgical services within Birnin Kebbi,

the State capital. Hafsat Eye Clinic was established in 2004 by the Kebbi State government in collaboration with Tuls Chanrai Foundation (TCF), an India based NGO reputed in high quality cataract services<sup>5</sup>.

The FMC eye clinic was established in 2003. It has 15 beds capacity and provides tertiary eye care services. The Royal Balm Eye Clinic is a private clinic that commenced services in March 2014.

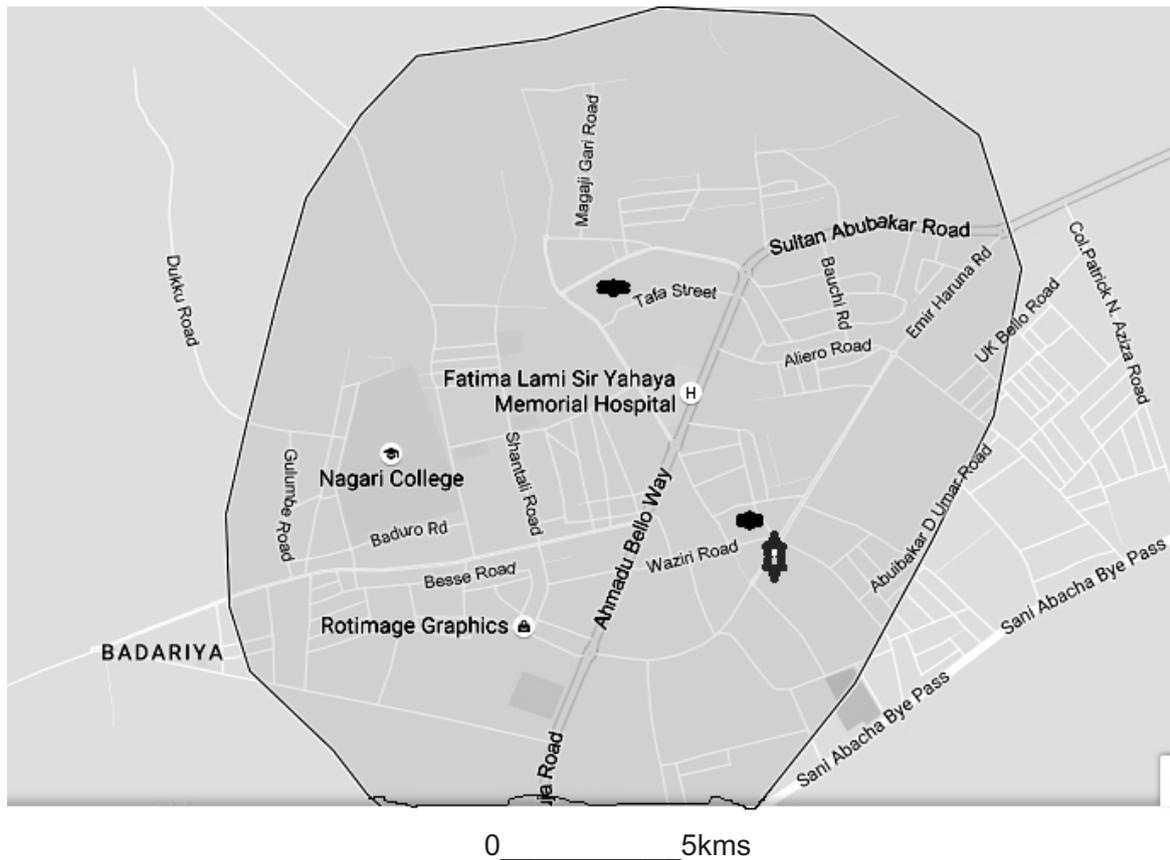


Figure 2: Birnin Kebbi map shown the location of 3 hospitals

### Justification for the study

The cataract surgical services delivery started in Kebbi State in 2004 with establishment of Hafsat Eye Clinic by the Kebbi government and the signing of a memorandum of understanding with Tulsu Chanrai Foundation, an India based Non-Governmental Organisation. However no evaluation has being done to examine the standard of services provided. This study assessed the state of cataract services and constraints in Kebbi and suggested ways to improving it.

### AIM AND OBJECTIVES

#### Aim

To evaluate the cataract surgery numbers and constraints to delivering of optimal cataract services in Kebbi, Nigeria.

#### Objectives

1. To document the number of cataract surgeries being performed by each health institution (Federal, State and private) in Kebbi State.
2. To identify the constraints in the delivery of cataract services.
3. To make recommendations on how to improve the delivery of cataract services.

### MATERIALS AND METHODS

#### Study design

This is a descriptive and analytic cross-sectional study conducted from June 18th to July 10th, 2016 in three hospitals (Federal Medical Centre, Hafsat Eye Clinic and Royal Balm Eye Clinic) offering cataract surgical services in Kebbi.

#### Inclusion criteria

In each facility, 4 persons (a senior ophthalmologist, senior ophthalmic nurse, programme manager/administrative officer and the medical director/head of the hospital) were interviewed using structured questionnaires.

#### Data collection

The data were collected using modified questionnaires used in a previous similar study<sup>7</sup>. The questionnaires were administered to the selected key opinion leaders in the 3 hospitals asking about the number of human resources rendering cataract services in their facility, the availability, state of instruments/infrastructure, health information management and pharmacy for cataract services. Furthermore, at each facility, questionnaires were also administered to each senior ophthalmologist, senior ophthalmic nurse and programme manager/

administrative officer of cataract services asking about the constraints facing the services.

The medical director/head of the hospital was also asked about financing of the services. The 4-year records (2012-15) of each of the tertiary and the State hospital as well as 2-year records (2014-2015) of a private hospital was examined to estimate the number of cataract surgeries performed. While other information is being reported in a separate communication, this article evaluates cataract surgery numbers and constraints to delivering optimal cataract services in Kebbi.

#### **Pilot study**

Pilot test for the study was done at Usmanu Danfodiyo University Teaching Hospital (UDUTH) Sokoto, a teaching tertiary hospital in Sokoto a neighbouring state where cataract surgical service is rendered. The problems noted during the pilot test were corrected.

#### **Data management**

The data were double entered into Excel spreadsheet and later exported onto and analysed by Stata 14. The analysis was done using simple frequency

proportions and is presented as tables, charts and graphs.

#### **Ethical consideration**

Ethical clearance for this study was obtained from London School of Hygiene and Tropical Medicine Ethical and Research committee. In addition, ethical approval was obtained from Kebbi State Ministry of Health and Federal Medical Centre (Birnin Kebbi) Research and Ethical committee. Furthermore, permission was also obtained from the Nigeria Director of Tulsu Chanrai Foundation (TCF) in Abuja, Nigeria. Moreover, there was written consent from each eye care worker interviewed at the three hospitals. The data collected was code protected in computer and accessed only by the researcher.

## **RESULTS**

#### **Services delivery**

The Kebbi State hospital carries out eye surgeries 3 days in a week and renders services to more patients per hour compared to other facilities in the state (Table 1).

Table1: The distribution of operating theatre day/week and cataract operation per hour

	<b>Tertiary</b>	<b>State</b>	<b>Private</b>
<b>Operating theatre day/week</b>	1	3	2
<b>Cataract operation/hour</b>	1	6 – 7	2

#### **Cataract output**

Cataract surgical output was collected from 2012 to 2015 in tertiary and state hospitals while, only 2 years record (2014-2015) was obtained for private hospital because the hospital was established in 2014. Overall, the state hospital had the highest cataract surgeries within the study period. The year

2015 recorded highest number of surgeries. Two thousand, three hundred and eighteen (2318) surgeries were performed. The CSR was calculated based on estimated Kebbi State population from 2012-2015. Figure 3 shows cataract surgeries performed per year.

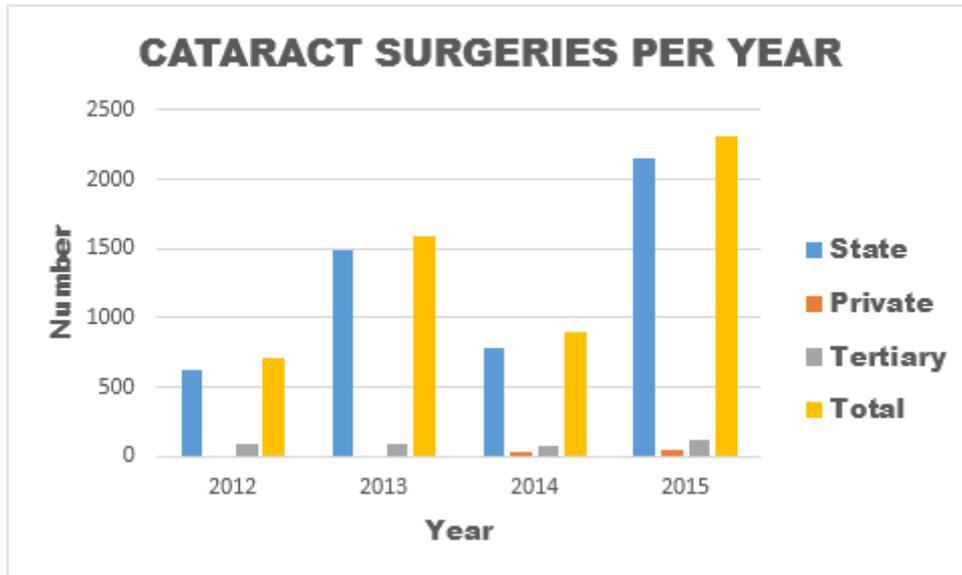


Figure3: Cataract surgeries performed per year

CSR increased by 109% in the year 2013 from 2012. However, it dropped by about 56% in 2014. The CSR was highest in the year 2015 with 125% increment from year 2014 (Table 2). However,

breakdown of number of surgeries per surgeon revealed better output from state surgeon than in the other two facilities (Table 3).

Table2: Number of surgeries and cataract surgical rate 2012-2015

Year	2012	2013	2014	2015
Estimated Kebbi Population (million)	3.81	3.9	4	4.09
Number of surgeries	713	1584	900	2318
Number of surgeon	4	5	5	5
Number of surgeries per surgeon	178	317	180	464
Cataract surgical rate	187	406	225	567

Table 3: Number of surgeries per year/surgeon in each facility

Year	Tertiary				State				Private	
	2012	2013	2014	2015	2012	2013	2014	2015	2014	2015
Number of surgeries	87	90	83	120	626	1494	782	2158	35	40
Number of surgeons	2	3	3	3	2	2	2	2	2	2
Number of surgeries per surgeon	44	30	28	40	313	747	391	1079	18	20

Percentages of Intraocular Lenses (IOL) Inserted  
All the cataracts surgeries performed at state and private hospitals within the study period had intraocular lens (IOL) inserted while, between 95%-99% operated cataract at tertiary facility had IOL inserted.

(8750) who were attended to in the 3 hospitals, with state hospital represented by 55% of the total patients. Figure 4&5 shows number of new and total patients that were attended to at each facility per year.

Patients' attending the health facilities  
Year 2015 recorded highest number of patients

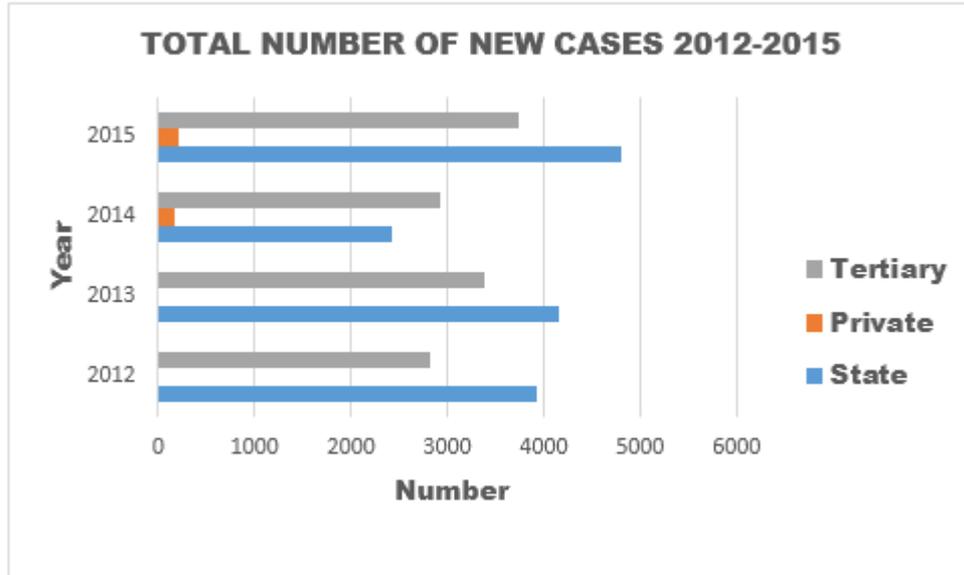


Figure 4: Total number of new cases seen per year

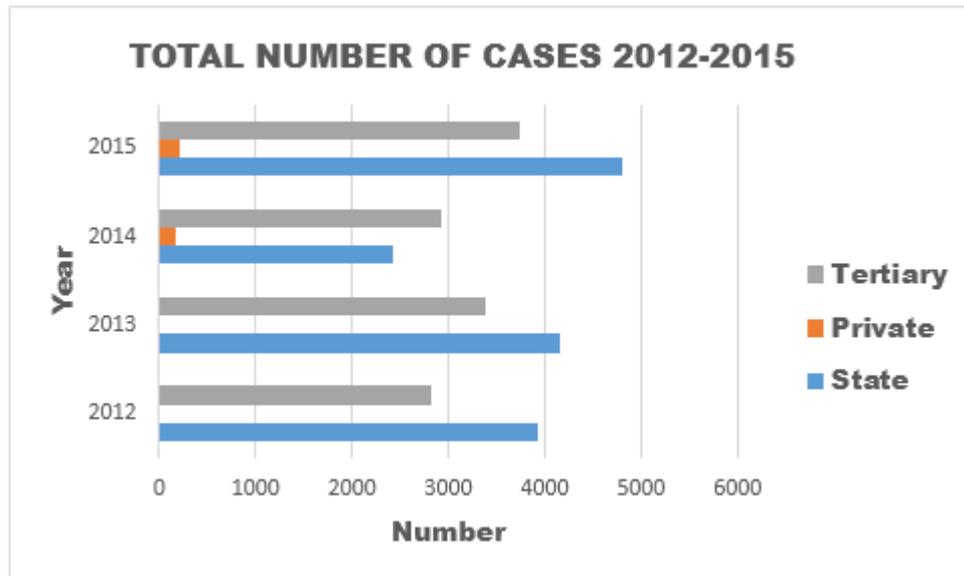


Figure 5: Total number of cases seen per year

**Eye Care Workers (ECW) opinion on Barrier to cataract surgery**  
Demographic of interviewed ECW

respondent is 47.33 years (SD 6.6 years) and age range between 33 and 54 years (table 4).

There were 8 (67%) males. The mean age of

Table 4: Gender and Institution distribution

		Institution			Total
		Tertiary	State	Private	
Sex	Male	3	3	2	8
	Female	1	1	2	4
Total		4	4	4	12

The most important patients' related barriers to increasing cataract output were poverty, distance of clinic, patient fear, lack of awareness, cultural belief and ignorance. The eye care providers' related barriers were cost of surgery at tertiary and private

facilities, patients waiting too long before surgery and long waiting hours before being attended to at the outpatient clinic at the state hospital. Table 5 shows ECW opinion on barrier to cataract surgery.

Table 5: Eye care workers opinion on barrier to cataract surgery

		Tertiary n=4	State n=4	Private n=4
<b>Patients barrier</b>				
<b>Why do you think cataract patients do not come</b>	Transportation	-	1	-
	Lack of awareness	-	1	1
	Poverty	4	2	3
<b>The patients are afraid</b>	Yes	3	-	2
	No	1	4	2
<b>Patient unaware of cataract services</b>	Yes	2	1	3
	No	2	3	1
<b>The patients have other alternative</b>	Yes	4	-	4
	No	-	4	-
<b>Eye clinic too far</b>	Yes	4	4	4
	No	-	-	-
<b>Cultural belief</b>	Yes	3	1	3
	No	1	3	1
<b>Ignorance</b>	Yes	1	3	3
	No	3	1	1
<b>The most important reason</b>				
	Eye clinic too far			
	Patient unaware of cataract services			
	Poverty			
<b>Hospital barrier</b>				
<b>Cost of surgery</b>	Yes	4	-	1
	No	-	4	3
<b>No enough people to work</b>	Yes	1	2	1
	No	3	2	3
<b>Poor visual outcome</b>	Yes	4	4	4
	No	-	-	-
<b>No enough equipment</b>	Yes	3	1	-
	No	1	3	4
<b>Attitude of staff</b>	Yes	-	2	1
	No	4	2	3
<b>Patients wait too long each time</b>	Yes	2	4	1
	No	2	-	3
<b>Service process are cumbersome</b>	Yes	4	1	-
	No	-	3	4
<b>Long waiting time before surgery</b>	Yes	-	4	-
	No	4	-	4
<b>Lack of good referral system</b>	Yes	1	-	-
	No	3	4	4
<b>The most important reason</b>	No enough people to work	1	1	-
	Service process are cumbersome	-	1	-
	Patient wait too long before surgery	-	2	-
	Cost of surgery	3	-	4

## DISCUSSION

Cataract Surgical Rate (CSR) in Kebbi State sharply increased to 180% by 2013 from 2012. The declination in 2014 could be explained by the increased terrorists' attacks and religious unrest in the northern part of Nigeria result in temporary closed down of the Hafsat Eye Clinic. The highest number of CSR recorded in year 2015 might be due to the effective effort of Nigeria security agents against the insurgents. The CSR of Kebbi State in the year 2013 (406) and 2015 (567) was more than Kwara State CSR of 300 recorded by Ogundimu<sup>8</sup> in 2001. However, the CSR fell below the projected target of 2,500 for the year 2015. The state hospital contributed between 80%-99% to the total CSR yearly.

Intra Ocular Lens (IOL) implantation in Kebbi State is between the good ranges of 95%-100%. The 100% implantation was recorded at state hospital. This may be due to more surgical experience and good patients' selection by the State's surgeons.

More than total half of patients were seen yearly at the State hospital compared to other facilities this may be due to cataract service delivery at the State hospital at no cost to the patients. The poor people readily buy into free health care services including cataract service.

There was no significant increment in the cataract output in 2013 at the tertiary health facility despite the conduct of three community cataract surgical outreach camps. This explained that outreach programme alone without other factors such as provision of transportation, staff attitudinal changes and lower cost of surgery will not results in increase CSR.

The state hospital with less yearly budget compared to tertiary hospital was more efficient and cost effective because large volume of cataract surgeries was performed. However, the State hospital had great support from NGO. This necessarily buttresses the fact that the productivity of the eye hospital goes beyond budgeting. The motivated staff, surgeon surgical skill, and provision of adequate instrument play an important role in the service delivery.

The major patient's factors reported by the interviewed Eye Care Worker (ECW) to be responsible for decrease in the cataract services delivery were poverty, distance of eye clinic, fear of surgery, lack of awareness, cultural belief and ignorance. While, cost of surgery (at tertiary and private facilities), patient wait too long before being seen, long waiting list before surgery at state hospital

were providers' factors for the decrease in the cataract output. This is similar to previous studies in the northern part of Nigeria<sup>9,10,11</sup>.

The cost of surgery has been reported by various studies to be the most important cause of poor utilization of hospital services in the developing countries<sup>9,10,11,12</sup>.

The cost reduction through bulk purchasing of consumable materials, different paying system, cross subsidization and increase efficiency through large volume surgeries have been suggested to be the best solution to the decrease in the cost of surgery in developing countries<sup>7</sup>. Furthermore inclusion of cataract services in the Kebbi State Health Insurance Scheme (KHIS) will help in the uptake of cataract services in Nigeria. Regrettably, lack of good referral, poor visual outcome, inadequate number of eye care workers and poor staff attitude were not viewed by the interviewees as important barriers to cataract services in Kebbi State.

## LIMITATIONS OF THE STUDY

1. The study look at services delivery from the providers' prospective
2. Qualitative study of barrier to services would have given better in-depth than the quantitative study.
3. Bias might have been introduced by the interviewee Eye care health workers at the tertiary hospital since the researcher was one of their staff. However this problem was minimised/resolved by preceding explanation conveying the important of the study towards improving cataract services delivery in Kebbi State.
4. The interpretation of the causes of barrier to cataract services cannot be generalised because of few number of ECW interviewed. However, it would be useful in addressing highlighted barriers in the concerned health facilities.

## CONCLUSION

Cataract surgical services in Kebbi state has been improving since 2012. The free cataract services at the State hospital play an important role in the reduction of cataract blindness. Employment of more surgeons at the State hospital, reduction in the cost of surgery and further training of surgeon at tertiary facility are important factors in improving cataract services in Kebbi State.

## Implications on both clinical practice and policy maker

Implication of this study on policy maker – it enable

the policy maker to know where they can help/intervene in the improvement of eye care services delivery in Kebbi state.

Implication of this study on clinical practice – it help in the assessing and providing better cataract services to needed populace.

## RECOMMENDATIONS

### Kebbi State Government

1. The ECW should work with the other stakeholder so as to include cataract services in KHIS
2. Establishment of more surgical centre at all the 6 emirates of Kebbi State.

### Tertiary hospital (FMC)

1. Reduction in cost of surgery through various cost containment will help in increasing the uptake of cataract services
2. The training of surgeons and other ECW will improve the effective services delivery
3. Promote awareness programme about cataract services delivery through various media outlet
4. Effective community outreach programme with the involvement of community leader will help in improving uptake of services
5. The establishment of co-operation and linkage between tertiary ECW and state hospital will help in improving surgical skill of surgeon in the tertiary hospital.
6. The establishment of satellite eye clinics/hospitals will help in increasing the cataract output.

### State hospital (Hafsat Eye Clinic)

1. The employment of more surgeons and other provisional health worker will help in preventing long waiting list
2. The training of indigenous doctors as cataract surgeons by the NGO will help in promoting sustainability of the free cataract services
3. The establishment of a good referral system for effective referral of cataract patients from all the general hospitals within the State.
4. The commencement of staggered appointment will help in reducing the long waiting time

### Private hospital (Royal Balm Eye Clinic)

1. Reduction in cost of surgery through various cost containment will help in increase uptake of cataract services
2. Promote awareness programme about

cataract services delivery through various media outlet

3. The establishment of effective community outreach programme will help in the increase uptake of cataract services

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