

Should glaucoma treatment be public funded in Nigeria?

Dissertation for the Award of Master of Arts in Medical Ethics and Law, School of Law, Centre for Professional Ethics at Keele University, Keele, Newcastle Under Lyme, Staffordshire, UK.

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MA Medical Ethics and Law

Dissertation ETH 40041

Word count: 19 994

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Abstract

Hundreds of thousands Nigeria's Individuals With Glaucoma are losing vision because they cannot afford glaucoma treatment. The Nigeria's majorly open market healthcare makes glaucoma treatment compliance impossible among mostly poor Individuals With Glaucoma. This work analyses arguments against and for public funding glaucoma treatment with a conclusion that Nigeria should fund glaucoma treatment. The arguments against consider opponent's alleged major obstacles to public funding especially inherent complexity of glaucoma disease, poor level of glaucoma awareness and glaucoma education among Nigerians, inadequate resources for glaucoma care, and doubtful Nigeria's economic incapability to fund glaucoma treatment. The Quality Adjusted Life Year and Utilitarian approaches to diseases prioritization towards funding but not necessarily humane are also considered. The arguments for public funding glaucoma are discussed in two sections; the first section considers possible harms of glaucoma impaired vision or blindness on the Individuals With Glaucoma and Nigeria's economy. Glaucoma's harms impact negatively on the Individuals With Glaucoma's daily activities, health, education, work and economy. The second section considers some justice based approaches to funding including Hippocrates, Marx, Rawls, Aristotle, utilitarianism, egalitarianism, communitarianism, capability theory, well-being theory and fair opportunity rule. Finally, a two tiered healthcare system especially tier-one that would provide basic universal healthcare including glaucoma treatment suggested. The work concludes that Nigeria should fund basic universal healthcare through a general health insurance policy that guarantees basic healthcare for diseases of public health importance including glaucoma treatment at no cost at point of delivery to enhance treatment compliance and reduce blindness from glaucoma.

Acknowledgements

I hereby acknowledge Dr. Sorcha Ui Chonnachtaigh who supervised this work for her useful suggestions. I appreciate Tertiary Education Trust Fund (TETFund), Abuja, Nigeria and University of Abuja, Abuja, Nigeria which in partnership sponsored me for Master of Arts in Medical Ethics and Law at Keele University, Keele, Newcastle Under Lyme, Staffordshire, UK. Also, I thank Keele University for its support through Keele International Students Scholarship (KISS) Award.

My special thanks to my loved ones especially Rashidat Oluwafunke, Mubarak Abiola, Mukhtar Obafemi, Farida Fadekemi & Hamida Folakemi who endured my absence while the programme lasted. Finally, I glorify my Creator - Omniscience - for the opportunity and blessings.

List of Initialisms

ARMD = age related macular degeneration

AUD = Australian Dollar

GDP = Gross Domestic Product

HIV/AIDS = Human Immunodeficiency Virus/Acquired Immuno Deficiency Syndrome

IOP = Intraocular Pressure

IWG = Individual(s) With Glaucoma {person(s) who suffer(s) from glaucoma}

N = Naira (Nigeria currency)

NHIS = National Health Insurance Scheme

NHS = National Health Service

OCT = Optical Coherence Tomogram

POAG = Primary Open Angle Glaucoma

QOL = Quality Of Life

USD = United States Dollar

YLD = years of healthy life lost as a result of disability

Chapter One

Introduction

1.1. Glaucoma overview

Definition

Glaucoma is a group of eye diseases with progressive loss of vision, characteristic visual field changes, optic nerve fibres damage and one of the risk factors is raised intraocular pressure (IOP) (Khaw and Elkington 2003, p. 36).

Prevalence

Globally, about 64.3 million people, aged 40 - 80 years have glaucoma, with a projection of 76 million by 2020 and 111.8 million in 2040 (Tham et al. 2014, p. 2081). Glaucoma is responsible for irreversible blindness in about 4.5 million people worldwide (Quigley and Broman 2006, p. 262) with the majority in Asia and Africa. With a prevalence of 0.7%, over 150 000 Nigerians above age 40 are blinded by glaucoma (glaucoma blinds) and many more in various stages of visual impairment. Except there are effective glaucoma control measures more Individuals With Glaucoma (IWG) risk irreversible blindness.

Types

Glaucoma has many types but the commonest is primary open angle glaucoma (POAG) in which there is no known causative agent however, many risk factors have been identified including IOP, family history (Kavitha et al. 2014, p. 2091), black race, central cornea thickness, and increasing age (Khaw and Elkington 2003, p. 37). POAG is common among people above 35 years of age. Whereas POAG is common among Nigerians, closed angle glaucoma is common among the Japanese.

Natural history

Glaucoma has phasic natural history including early phase which is very difficult to detect, middle phase which is detectable with high clinical acumen and investigation, and late phase which is detectable by clinical examination. Glaucoma is a very worrisome eye disease because it causes irreversible damage to optic nerve fibres. However, detection of glaucoma in its early phase and sustained effective treatment can slow down its progression towards preserving useful vision (Kim 2015, p. 160; Mafwiri et al. 2005) thus, underscoring the need to screen people particularly those at risk of glaucoma to enhance early detection and treatment towards preserving useful vision in glaucomatous eyes.

Glaucoma is a relentless degenerative eye disease with optic nerve cells at various stages of degeneration. Three categories of nerve cells are therefore possible including dead, dying and living (normal). The dead nerve cell is irreversible and irreplaceable. The balance of normal and dead nerve cells has implication on visual function; a situation where most or all nerve cells are

dead would produce corresponding visual impairment or blindness. Therefore, treatment aims to preserve normal cells, restore normal function in dying cells and minimize harmful byproducts of dead cells.

Treatment options

Many treatment measures are available for glaucoma including awareness towards early detection, medication and surgery. Globally, the second week of March (glaucoma week) has been set aside to create awareness on glaucoma. There are basic and sophisticated resources that can detect or diagnose glaucoma. The clinical interventions to control glaucoma include anti-glaucoma drugs and various surgical procedures including laser applications (Khaw and Elkington 2003, pp. 39-40).

There are challenges to successful prevention of glaucoma blindness among Nigerians including low level of glaucoma awareness and education, late presentation (Omoti et al. 2006, pp. 97-100), poor treatment compliance and inadequate yet lopsided glaucoma care resources (Abdu 2013, p. 1). Importantly, inability of mostly indigent Nigerian IWG to afford treatment is worrisome and requires an urgent attention to reduce burdensome blindness and visual impairment in the IWG.

1.2 Research Question

Untreated or poorly treated glaucoma remains a worrisome cause of irreversible blindness among Nigerians. Despite the likelihood of preventing glaucoma blindness by early and

sustained treatment, most Nigerians would not have glaucoma treatment because they cannot afford it. However, glaucoma treatment has minimal benefit of marginally improved vision making it less cost effective and less appreciated by the IWG. Nonetheless, glaucoma treatment is a healthcare need because it can preserve useful vision in the IWG. Comparatively, the price of glaucoma blindness should be much more burdensome to society than the price for marginal visual improvement on glaucoma treatment. Whereas blindness arguably has little if any monetary worth, marginal visual improvement is priceless. Should glaucoma treatment be public funded in Nigeria?

1.3 Rationale

Currently, thousands of Nigerians are either visually impaired or blinded by glaucoma. The trend is regrettable as early and effective treatment can preserve life-long useful vision in the IWG. A major reason for the unfortunate trend and the concern of this work is inability of many IWG to afford glaucoma treatment. This remains a big challenge to sight preservation efforts as the IWG are not seeking treatment, presenting late for treatment (Adekoya et al. 2014), and complying poorly to treatment including outright dropout from glaucoma care (Ashaye and Adeoye 2008, p. 227). The rationale for this work is based on my personal observations in eye care practice, Nigerian studies, and Nigeria's healthcare indices.

My observation indicates many IWG cannot afford glaucoma treatment

I have noticed over the years of eye care practice in Nigeria that many IWG cannot genuinely afford glaucoma treatment because they are very poor. In an opinion survey of 229

beneficiaries of a cost free eye care in Nigeria, most participants (57%) indicate reason for attending the programme as inability to afford paying eye care services (Ayanniyi and Fadamiro 2010, p. 93). The proportion may even be higher were only IWG surveyed. The IWG even when aware of their progressive failing vision and available eye care services rarely access eye care for lack of funds. Many IWG are either not gainfully employed or earn less than adequate for their basic life needs.

IWG' poor treatment compliance suggests their inability to afford treatment

In an analysis of 452 dropouts from a follow-up glaucoma clinic in Nigeria, Ashaye and Adeoye (2008, p. 227) report as high as 60.5% dropouts within a year. Notably, 43.1% dropouts occur immediately after the first follow-up eye clinic visit. Regrettably, the study downplays the inability of many IWG to afford glaucoma treatment as it concludes that the high dropouts might be due to the IWG' perception of glaucoma as being not a serious eye condition.

Rather, the high dropouts from a glaucoma clinic particularly after receiving appropriate counseling from eye specialists plausibly suggests inability to afford further treatment by many of such dropouts. This would be much so, as the dropouts include (poor) students, unemployed, retirees or dependants. In a study, Adekoya et al. (2014) report that 27.7% of 177 IWG are retirees. Besides, the high dropouts in the study among the IWG on multiple anti-glaucoma eyedrops and those from far distances to the eye clinic would plausibly be due to their inability to afford the cost of glaucoma treatment.

On the other hand, the view that cost adversely affects glaucoma treatment among IWG is further buttressed by the study's affirmation that 37.2% of those with severe glaucoma, 40.8% of those who reside nearer the eye clinic and 52.1% of those on single medication also are dropouts from the follow up clinic. It appears unreasonable for the IWG to trade-off sight with blindness having been properly informed by the eye specialists the danger of not getting treatment especially when such IWG can afford treatment. Nonetheless, some IWG may display unusual behaviour.

The cost of glaucoma treatment is prohibitive to an average IWG

The cost of treating glaucoma is beyond what an average Nigerian IWG would afford especially on life-long basis. Glaucoma treatment comprises direct cost particularly for anti-glaucoma drugs and surgeries, and indirect costs for associated expenses - tests, transport. In a study among Nigerian IWG, Adio and Onua (2012, p. 2023) report a monthly anti-glaucoma direct cost of N6 000 (USD 40) and when indirect costs are added, the cost increased to N15 810 (USD 105.4) per IWG. Notably, nearly three quarters of IWG (73.3%) pay out of pocket for their treatments and two third (80, 66.7%) visited the eye clinic monthly. Though, surgery is believed to be a cheaper option, (USD 275.4, N41 310), no IWG opted for it. Undoubtedly, many IWG would neither access nor afford life-long treatment cost in a specialist's eye clinic because they are few and expensive.

Nigeria lacks universal health insurance coverage

The available National Health Insurance Scheme (NHIS) enrolls only Nigerians who are government or corporate organizations' employees who constitute a small fraction of

population. Besides, the enrollees have to pay 10% of their treatment fee at delivery and many times NHIS treatment is incomplete because required tests or drugs may not be available. Of course, some tests and specific glaucoma treatments are not covered by NHIS. Usually, all NHIS ineligible Nigerians and sometimes many NHIS enrollees either pay out of pocket or forgo treatment if they cannot afford it.

Glaucoma lacks Sponsors or Funders

Unlike cataract treatment that readily attracts funding for being quite cost effective, glaucoma is notorious for not being attractive to funders or sponsors. Remarkably, the IWG get little or no treatment attention during funded periodic free eye care across Nigeria. Glaucoma is an 'orphan' requiring public funding.

Glaucoma is common among working age group

Glaucoma is a leading cause of visual impairment and blindness among Nigerians especially the working age group. In a nationwide survey of visual impairment and blindness among Nigerians aged 40 years and above, glaucoma has a prevalence of 0.7% and second only to cataract, the most common cause of blindness, which has a prevalence of 1.8% (Abdull et al. 2009, pp. 4114-4120). It is of note that many Nigeria communities have glaucoma prevalence above a national average of 0.7%. This translates to more than 150 000 blind Nigerians from glaucoma alone. Equally worrisome is the fact that many working-class Nigerians who are at various stages of visual loss from glaucoma may end up being blind. Glaucoma blindness depletes Nigeria's work force.

Nigeria's healthcare resources are lopsided in cities

Whereas more Nigerians reside in rural than urban areas, there is less health resource in rural than urban areas (Adepoju et al. 2011, p. 822). This can lead to glaucoma treatment and eye clinic follow up noncompliance as many IWG residing in rural areas may not be able to sustain or afford distant journey in accessing lopsided resources for glaucoma care in the urban areas. This essentially translates to added cost (indirect cost) of care considering the transportation, escort and time loss.

Glaucoma has negative impact on IWG' quality of life

Finally, glaucoma causes blindness among Nigerians with negative impact on the quality of life. Onakoya et al. (2012) demonstrate in a study among Nigerian IWG that the quality of life reduces in glaucoma even in its early stage and worsen with the severity of the disease. Overall, glaucoma has negative impact on the IWG and society.

1.4. Dissertation overview

This work considers arguments against and for a Nigeria nation providing resources to treat its citizens who suffer from glaucoma and holds that funding would be in the overall interest of Nigeria. This chapter - contains five sections; background on glaucoma, the research question, the rationale, this section (the overview) and the concluding part of chapter outlines the answer to the research question.

Chapter Two essentially explores the plausible arguments against Nigeria's funding glaucoma treatment from an opponent's perspective. However, the chapter also provides necessary

rebuttal to an opponent's view. The opponent contends that glaucoma is inherently difficult disease and its treatment has marginal benefit. Nonetheless, the complexity of glaucoma should attract public sympathy towards its funding. The opponent considers it unfair for Nigeria to fund glaucoma in the face of other competing, more cost effective healthcare needs however; any disease like glaucoma that causes suffering deserve to be treated. Besides, the opponent submits Nigeria lacks adequate healthcare resources to embark and sustain a Nigeria-wide glaucoma treatment but resources can be mobilised for glaucoma treatment. Also, the Nigerian populace, especially the IWG, is thought not to have glaucoma education or aware of their expected role to make glaucoma treatment a success but the programme will create awareness as it progresses. Importantly, the argument that Nigeria's badly managed economy would not fund glaucoma treatment because of its required huge resources than envisaged is examined.

Chapter Three is divided into sections that mainly provide arguments for Nigeria's funding glaucoma based on harms of glaucoma blindness. The first section is on adverse effects of glaucoma on visual function domains including visual acuity, visual field, colour vision, depth perception and contrast appreciation. It notes correlations between glaucoma visual impairment and diminished quality of life in the IWG. The fact of glaucoma treatment beneficial effects is noted. The implication of glaucoma damaging effects on visual function to the IWG's daily activities, health, education, economy, and work are analysed in the remaining section of the chapter. The arguments relate harms of glaucoma to the IWG to its negative impact on

society. Importantly, the chapter notes that public funding glaucoma treatment is social justice and has much economic gain.

Like Chapter Three, Chapter Four is divided into sections but essentially focuses on justice in resource allocation - argues for Nigeria's funding glaucoma. The first resource allocation section observes that glaucoma funding can benefit from healthcare resources at three levels including macro, meso and micro-allocations. Second, a section provides justice-based arguments especially Hippocrates, Marx, Rawls, Aristotle, utilitarianism, egalitarianism, communitarianism, capability theory, well-being theory and fair opportunity rule for Nigeria's funding glaucoma treatment. These justice-based approaches contend that Nigeria's funding glaucoma would plausibly enable the IWG to lead a flourishing life and be able to achieve their life goals which blindness caused by glaucoma would have prevented. Third, a justice-based healthcare rationing and a two tiered healthcare system are suggested towards funding glaucoma in Nigeria. While tier-one healthcare provides basic universal healthcare for diseases of public health importance including glaucoma at no cost at the point of delivery; tier-two covers all imaginable glaucoma care but at the IWG's expense. The chapter observes that Nigeria should provide a general healthcare insurance cover to sustain tier-one. Finally, the chapter holds that ethical-based rationing in glaucoma treatment would save cost without compromising the best possible visual preservation among the IWG.

Finally, Chapter Five concludes the work by reiterating that glaucoma causes irreversible blindness among Nigerians which by so doing interrupts the IWG's flourishing lives and consequential huge economic loss to Nigeria. The majorly open market healthcare cannot

adequately meet the goal of reducing glaucoma blindness. However, public funding glaucoma can reduce glaucoma blindness and would signify social justice and socio-economic gains. It is proposed a two tiered healthcare where tier-one provides cost free basic universal healthcare including glaucoma care and being sustained through general health insurance to all Nigerians.

1.5. Conclusion

Nigeria can and should fund glaucoma treatment. Glaucoma causes irreversible blindness that necessarily interrupts flourishing lives making the IWG unable to achieve their life goals. Loss of vision affects all opportunities open to the IWG in life. The opportunity available to visually impaired IWG shrinks and can be a fairly crude measure of the relative moral importance of healthcare needs for glaucoma. Therefore, glaucoma by its effects on human life is a disease making its treatment a need. Interestingly, treating glaucoma has capacity to sustain useful vision and would have appeal to social justice. It holds promise to protecting flourishing life and enhancing Nigeria's economy by enabling the IWG to be productive.

Chapter Two

Arguments against Nigeria's funding glaucoma treatment

2:1 Introduction

Despite glaucoma being responsible for blindness in thousands of Nigerians and accompanying disruption of their flourishing lives, Nigeria's funding glaucoma would not be easy to accomplish. This chapter analyses opponent's arguments against Nigeria's funding glaucoma treatment. These include an inherent complexity of glaucoma, inadequate healthcare resources, the IWG factor and economic reason.

2:2 Glaucoma is inherently complex eye disease

The opponent to public funding glaucoma treatment may argue that glaucoma is **inherently complex eye disease and in most cases the cause is unknown** but rather shrouded in pressure, neural, vascular and mechanical theories (Fechtner and Weinreb 1994, pp. 23-42; Weinreb and Khaw 2004, pp. 1711-1720). At best glaucoma is only associated with many risk factors particularly IOP, family history, and race which are further indications that glaucoma treatment would be difficult and less cost effective. Even IOP is only controllable never can family or race of the IWG be modified.

Contrary to the opponent's argument, the complexity of glaucoma as a disease should elicit public concern for the IWG rather than being a hindrance to public funding glaucoma treatment. Glaucoma is not a self-inflicted condition like lung cancer in chronic cigarette smoker or liver cancer in chronic alcoholics rather, glaucoma is either genetically or sporadically acquired. Even when health conditions are self-inflicted they are not absolute hindrance to public support for such individual. If public can consider funding equally challenging diseases like sickle cell anaemia, HIV/AIDS and cancers; glaucoma should reasonably equally enjoy similar funding consideration.

The opponent to public funding glaucoma may further contend that **glaucoma is inherently relentless once it manifests** and even when treated it cannot be cured. Moreover, glaucoma treatment is not IWG-friendly because it has to be sustained to make impact if any, and probably a reason for its notoriety for the IWG's poor treatment compliance. Undoubtedly, glaucoma is relentless but it is similar to and should be ranked in the category of systemic hypertension and diabetes mellitus that are not curable but are controllable. Rather than excusing funding glaucoma and the IWG's compliance to treatment on the need to sustain its treatment for life, glaucoma should receive a deserved attention like hypertension and diabetes mellitus that are equally not curable but controllable. Funding glaucoma treatment should be premised on being controllable rather than its funding being excused on its relentless nature.

On another note, the opponent may argue glaucoma non-funding **based on anti-glaucoma drug side effects** because some anti-glaucoma drugs are associated with annoying side effects for instance, diamox is known for diarrhea, metallic taste and tingling sensations. It is

counterproductive should the IWG fail to use anti-glaucoma drugs even when such are free at delivery. Notably, this would not be a reasonable justification to abandon public funding glaucoma treatment because side effects are not limited to only anti-glaucoma drugs.

Generally, all drugs have side effects though, some are insignificant and some anti-cancer drugs may even have life threatening side effects. It is a fact that the side effects of anti-glaucoma drugs are uncommon, tolerable and are rarely life-threatening. Of course, there are many tolerable anti-glaucoma drugs that are being used without any untoward effects on the IWG.

Furthermore, the opponent may argue that **the diagnosis of glaucoma is not easy especially at its early stage** when it has not caused much damage to the eye. Glaucoma is such that it cannot be diagnosed in its earliest stage, very difficult to diagnose in its earlier stage and would require specialist for diagnosis in its early stage. Even with that some cases of glaucoma would still be misdiagnosed. Sometimes there is confusion between glaucoma and other ocular conditions that may mimic glaucoma such as myopia or familiar high cup disc ratio. This would impact adversely on effort to reduce blindness through funding glaucoma treatment. Nonetheless, this should not be a hindrance to public funding glaucoma as the number of misdiagnosis if any would not be significant enough to excuse funding glaucoma treatment. It would rather be a challenge that is easily resolvable by eye care specialists through improved expertise or diagnostic skills with time the more the number of the IWG accessing glaucoma treatment. On a practical note, it would be absolutely impossible to totally eliminate occasional misdiagnosis in medical practice as atypical but rare disease conditions do occur.

To the opponent, the **objective of public funding to prevent blindness from glaucoma is even unlikely to be feasible**. This is so as it would only be possible in condition of early diagnosis and sustained treatment for glaucoma. For reasons not limited to inadequate resources, many Nigerians would necessarily not be diagnosed early enough to be helped even if treatment is free at delivery. Moreover, population screening of Nigerians for glaucoma is impossible for economic and logistic reasons. Should such screening even be feasible, Nigeria has no resources to accomplish it. Though, a total population screening is ideal but the truth is that no society can afford it. It is counterproductive to invest huge public resources on glaucoma treatment only for the beneficiaries to present themselves at a late stage of the disease when treatment would virtually be of no use.

Contrarily, the opponent position appears theoretical as experiences during cost free eye care programmes across Nigeria over the years prove beyond reasonable doubts that Nigerians would access cost free glaucoma treatment services if public funds it. It is an incontrovertible fact that usually, Nigerians turn out in great numbers to access all cost free health programmes especially cost free eye care services. The IWG would not only avail themselves with glaucoma treatment which is free at point of delivery should there be such opportunity but would also come along with family members which would help in early diagnosis of the IWG.

2:3 Lack of adequate resources for glaucoma care

The opponent may further argue against public funding glaucoma treatment on account of **inadequate resources for eye care** as the success of glaucoma treatment would draw largely from early detection and sustained treatment for glaucoma. This would require trained manpower, equipment and health facilities for effective delivery. At present the proportion of such sophisticated resources to Nigeria's population is very low to achieve success for Nigeria-wide glaucoma treatment.

Paradoxically, **Nigeria's population is skewed towards remotely located rural settlements whereas the available inadequate resources for glaucoma care are lopsided in urban areas** (Adepoju et al. 2011, p. 822). This would necessarily lead to glaucoma treatment noncompliance among rural IWG who would not be able to afford added travel costs (indirect cost). Even, not all eye clinics are adequately equipped to render glaucoma services. In a study on challenges of glaucoma service delivery in tertiary facility in Nigeria Olatunji et al. (2008) underscore the need to improve on resource for glaucoma treatment.

Nonetheless, Nigeria cannot have all required resources to undertake Nigeria-wide glaucoma treatment from the outset rather there would be improvement through resource mobilization and redistribution over time. It is a fact of life that any worthwhile venture is not without its initial challenges that are taken care of over time. Great and successful ideas or technologies including motors, aeroplane and even computers were neither aesthetically appealing nor very effective and efficient at their inception but today combine all and are still improving. The UK NHS and the US Medicaid reached their towering heights after passing through turbulent

periods and are still subjects of periodic reviews. Public funding glaucoma can definitely outgrow the limited manpower and material resource obstacles with their fair distribution across the Nigerian communities.

2:4 Poor glaucoma awareness and education among Nigerians

In another vein, the opponent may argue that **poor level of glaucoma awareness and education among Nigerians** would jeopardise public funding glaucoma treatment. This is so because education plays a significant role in awareness and knowledge of consumers of healthcare services. It is doubtful if the goal of reducing the number of Nigerian glaucoma blinds would be achieved without people first being aware of glaucoma disease which plays a very crucial role in their early presentation for glaucoma care. Glaucoma treatment can only be meaningful when it is commenced in its early stage. This would require a high level of awareness and understanding among the populace. The huge resources expended towards preventing glaucoma blindness are wasted when the IWG seeks treatment at very late stage of glaucoma because treatment would no longer preserve useful vision.

Moreover, the success of glaucoma treatment, especially compliance, would depend much on glaucoma education among the IWG. This may be in form of eye care personnel verbal or written messages on glaucoma, treatment interventions especially salient investigations, drug administration and surgery. Second hand messages through an interpreter may not necessarily have similar impact on the IWG's compliance to treatment plan. The opponent may contend

with a view that funding would amount to a waste of taxpayers' money if the IWG fails to understand relevant information on treatment.

Undoubtedly, education would greatly assist the populace in information dissemination on glaucoma. However, it would be counterproductive to excuse funding glaucoma treatment on low level of glaucoma awareness or education in Nigeria. Education and awareness are dynamic processes and never a one-stop affair. Though, initial glaucoma awareness campaign across Nigeria is necessary, the programme itself has potential to drive its own awareness with time. Educationally, people have to enjoy normal vision to even benefit optimally in a learning process. Moreover, it is plausible to raise the level of awareness of people on glaucoma using mass media particularly radio as well as talks in the hospitals and communities in local languages. Practically, the level of glaucoma education and awareness in Nigerian communities are not too bad to discourage public funding glaucoma. Whereas Nigeria can embark on glaucoma awareness campaign among the populace, glaucoma education would be much more relevant to the IWG. It is counterproductive to withhold important project like public funding glaucoma treatment on a flimsy premise of poor glaucoma education among Nigerians. Even at that, Nigerians' glaucoma education is not as bad as the opponent appears to suggest.

2:5 Low priority rating of glaucoma compared with other health conditions

Moreover, to the opponent, it may be **unthinkable to isolate glaucoma treatment for public funding in Nigeria**. In the first instance Nigeria has high burden of other diseases like malaria,

sickle cell disease, HIV/AIDS, hypertension, diabetes mellitus and cancers. Admittedly, these are not necessarily primarily eye diseases but the high prevalence of each of them makes it a priority for Nigeria's funding ahead of glaucoma. Moreover, each of them being a systemic disease has secondary effect on eyes and can lead to blindness if not treated. Worse still is the fact that when untreated, each of them can primarily cause death unlike glaucoma.

Similarly, the opponent may argue that **glaucoma should not even be the first priority among eye diseases** for public funding in Nigeria for obvious reasons. For instance, the commonest cause of blindness in Nigeria is cataract with a prevalence of 1.8% compared with 0.7% for glaucoma among Nigerians who are at least 40-year-old (Abdull et al. 2009, pp. 4114-4120).

This implies the number of Nigeria's cataract blinds is more than double glaucoma blinds.

Besides, cataract treatment is less cumbersome compared with glaucoma treatment. Except for complicated cataracts (especially caused by trauma, diabetes mellitus, eye infection, congenital or hereditary diseases or complicated surgeries), cataract treatment guarantees marked improved vision compared with glaucoma where visual loss is irreversible. Moreover, cataract treatment is well defined and lasting for a definite period compared with glaucoma treatment which is life-long. Overall, cataract treatment is cost effective than glaucoma treatment.

Furthermore, though, refractive error has less prevalence of blindness compared with glaucoma, it is a leading cause of visual impairment among Nigerians. Public funding refractive error in place of glaucoma has potential to prevent visual impairment among Nigerians. Like cataract, treatment for refractive error is unarguably cost effective than glaucoma.

Comparatively, ocular trauma causes blindness mainly among youths but like glaucoma, it can

cause irreversible blindness and unlike glaucoma can elicit emotions that would earn the injured victims treatment. Overall, glaucoma may not be the most favoured for public funding should eye diseases be prioritised.

Contrary to the opponent submission, it is unfair to allege that glaucoma would be isolated for funding among diseases of equal or greater public health importance in Nigeria when eventually funded; rather glaucoma has not been receiving a deserved support. Of course, any disease that potentially or outrightly threatens a flourishing life qualifies to be treated. It is counterproductive to oppose funding glaucoma treatment because a particular disease has not been funded. Instead, there should be general advocacy for public funding all deserving diseases.

By the way, it is incorrect to insinuate that hypertension, diabetes mellitus, sickle cell anaemia, cancers, cataract and refractive errors are not accorded more priority than glaucoma in Nigeria. Rather, all these diseases receive far more funding attention though, not necessarily adequate, relative to glaucoma. Perhaps, the prioritization of these diseases for funding over glaucoma occurs because they are considered though, not necessarily correctly, of more public health significance therefore, swaying public attention from the plight of the IWG. Regrettably, public attention is erroneously distracted from funding glaucoma because of mismanaged Nigeria resources which if appropriately managed should be sufficient to fund all diseases of public health importance including glaucoma.

Moreover, it would be unfair to compare cataract and refractive error with glaucoma as they are usually amenable to treatment unlike glaucoma that causes irreversible blindness.

Therefore, should the irreversibility of the blindness be considered, glaucoma funding should even be prioritized over cataract because blindness from cataract unlike from glaucoma can be reversed. This does not necessarily amount to arguing against funding cataract. Besides, whereas either cataract or refractive error can readily attract donors to support its treatment such assistance is rare for glaucoma.

On another note, the opponent may employ **quality adjusted life years (QALY) and utilitarianism** to advocate public funding cataract, refractive error, hypertension and malaria rather than glaucoma. Suppose Nigeria is to fund each of these diseases. Suppose (1) a year of healthy life expectancy to be worth 1, (2) a year of unhealthy life expectancy to be worth less than 1 (Williams 1985, pp. 3-5), (3) an average life expectancy in Nigeria to be 60, (4) each IWG is 40-year-old and (5) the treatment of each disease cost N6 000 (£20) .

On treatment, it is possible to restore each individual with hypertension, malaria and cataract to her pre-disease (normal) state thus, each plausibly has a year of healthy life expectancy to be worth 1. Contrastingly, a treatment of visually impaired IWG would not restore vision to the previous normal state thus, a year of unhealthy life expectancy would be worth less than 1. Expectedly, more value would be added to the life of each individual with other diseases unlike glaucoma.

Equally, from a utilitarian point of view more Nigerians are afflicted by other diseases compared with glaucoma thus, the treatment of each would be greater good for a greater number compared with glaucoma treatment. Even, in order of healthcare need priority, glaucoma

would not be preferred for public funding in place of hypertension, malaria, and cataract.

Whereas other diseases can primarily cause death glaucoma can only do so secondarily.

The opponent argument exposes the pitfalls of QALY and utilitarianism. QALY and utilitarianism necessarily discriminate against funding glaucoma because the IWG are not as many as the number of individual with each of hypertension, diabetes mellitus, cataract and refractive error and also it may cost more to treat glaucoma relative to each of the other diseases. However, the IWG live with the reality of harmful effects of glaucoma and definitely both QALY and utilitarianism are unhelpful because they would prioritise for funding other diseases ahead of glaucoma.

The fact is each of the IWG experiences interruption to flourishing life just like individual with comparable other diseases. Though, QALY estimates that funding glaucoma treatment is not cost effective, the treatment associated marginal gain in visual recovery and capacity to preserve life-long useful vision are huge benefits of public funding glaucoma when compared with irreversible blindness from untreated glaucoma.

Marginal vision makes life worthwhile when compared with blindness that mostly makes life not worth living. Of course, QALY and utilitarianism are arguably setting double standard because it seems they trivialize harm caused by glaucoma while magnifying that caused by other diseases. Rather, glaucoma and other diseases are of equal importance as each of their respective afflicted individuals experiences discomfort and interruption to a flourishing life.

2:6 Nigeria cannot afford the expenses required for glaucoma treatment

Undoubtedly, the opponent may put up a strong argument that Nigeria is yet to **translate its huge potentials to socio-economic benefit** capable of supporting public funding glaucoma treatment. Notwithstanding, Nigeria being the most populous African nation, about 180 million people (Nigeria Population 2015), and Africa's largest economy, GDP 510 billion USD (Nigeria GDP 2015), its economic index shows most Nigerians are below the poverty line with about one-third of the entire population living in extreme poverty (Buhari 2015). Many Nigerians are either unemployed or poorly remunerated with consequential economic inequality. Nigeria society essentially has dual economies: first, a very rich economy for selected few who live in affluence and second, a poor economy for the majority who live in misery.

The trio of poverty, unemployment and inequality has implication for public funding of glaucoma treatment. It would be impossible to tax Nigerian IWG who are not gainfully employed. A public funded healthcare would be sustainable when there is public support particularly when beneficiaries pay taxes. Even with the payment of taxes by the UK citizens, rationing has to be introduced into public healthcare services as NHS bill increases yearly. Public funded glaucoma treatment would not be feasible or sustainable because most intended beneficiaries are indigents or not gainfully employed and would not be able to pay taxes to support glaucoma funding.

Foisting further economic argument, the opponent may posit that **Nigeria's economy cannot at present fund glaucoma treatment**. In the first instance, Nigeria has mono-product economy that depends on crude oil sales, however, the recent fall in price of crude oil necessarily plunges

Nigeria into economic crisis. The fall in crude oil price is unlikely to recover appreciably because there are advances in cleaner, safer, and more efficient alternative sources of energy. Besides, more crude oil deposits are being discovered globally. For instance, the US shale oil and the recently discovered Gatwick oil in the UK. A simple economic analysis would necessarily mean more oil and reduced market price. It is doubtful if Nigeria can fund glaucoma treatment without a predictable source of revenue.

Nonetheless, the opponent underrates Nigeria's economic potential and essentially pessimistic. Contrary to the opponent's argument, Nigeria can fund glaucoma treatment with potential benefit to improve Nigeria's economy (Chapter 3, section 3:3:4 contains further details). Nigeria is blessed with human and material resources – large population, fertile land, deposits of solid minerals and crude oil that can be harnessed to fund glaucoma treatment. Nigeria's economic predicament is not due to lack of resources but huge mismanagement of its resources (Gaskia 2013; Soludo 2015). For many years, most Nigeria's ruling class engaged in looting of public funds (Adetayo 2015; Saharareporters 2015) and lacked any concrete plan for the nation, impacting negatively on national development especially funding social services. Nigeria would comfortably afford social services including funding glaucoma treatment if it can successfully curb stealing and corruption in public places.

Interestingly, Nigeria appears committed to change the status quo for better by recently voting new government that so far has demonstrated the will power to tackle endemic corruption and mismanagement. Expectedly, the new government would create new jobs that would enable

more Nigerians to be gainfully employed as well as pay taxes to support public services including public funding glaucoma treatment.

Moreover, should Nigeria able to block huge revenue loss by tackling the growing crude oil theft (Isenyo 2015), it would have sufficient revenue to support social services including funding glaucoma treatment. Meanwhile, the crude oil price is dynamic and subjected to global market forces and a fall in price is not unusual. However, Nigeria needs to factor such into its economic plan so as not to be caught unaware during periods of global oil price recession. This would be necessary to enable Nigeria to sustain social services especially funding glaucoma treatment when implemented. Contrary to the opponent's argument Nigeria has resources but only need proper management to support public funding glaucoma treatment.

The opponent may still raise serious objection to public funding glaucoma treatment considering **the cost estimate of glaucoma treatment** itself. The cost of glaucoma treatment would include direct (visible) - for anti-glaucoma drugs and surgeries - and indirect (invisible) – associated expenses. In a study of economic burden of glaucoma among 120 Nigerian IWG, Adio and Onua (2012, p. 2023) report an average monthly direct cost of £20 (N6 000) for anti-glaucoma medication and with added indirect cost, increased to £52.7 (N15 810) per IWG. Also, two thirds (80) of the IWG (66.7%) visited the eye clinic monthly and the cost of glaucoma surgery was £137.7 (N41 310).

Suppose based on the finding, a conservative monthly cost implication of treating an IWG is £40 (12 000). Thus, an IWG would require a conservative estimate of £480 (N144 000) per year.

Suppose 1 million Nigerians require glaucoma treatment per year, this estimate would be £480

million (N144 Billion). There is likely a yearly increment due to increasing populating and improving life expectancy. Cumulatively, over an estimated life-time treatment period of 40 years for the IWG the cost implication is huge and beyond what Nigeria's economy would sustain. Even at present, expending £480 million (N144 Billion) on glaucoma treatment alone would implies Nigeria's health budget for the year 2015 would need to be supplemented and without attending to other important health needs.

Nonetheless, a Nigerian state should be able to support the glaucoma treatment per citizen with £20 (N6 000) monthly. Funding glaucoma treatment of its citizens should be considered a social service with positive impact on quality of life (QOL) and potential for huge economic returns. This would necessarily means the real cost Nigeria public would spend on each IWG is far less than £20 (N6 000) in the final analysis considering the potential benefits - preservation of flourishing life, ability to contribute to economy, tax remittance. The plausible modality on how Nigeria can reduce the real cost of glaucoma treatment is further discussed in Chapter Three (section 3:3:4 Economy). However, using the opponent's analysis to excuse Nigeria's funding glaucoma amounts to trade-off IWG's vision for blindness because funding would encourage treatment compliance to preserve vision unlike plausible blindness from lack of treatment. The fact remains that vision is invaluable, priceless.

To the opponent of public funding, **increasing life expectancy among Nigerians** would be a serious challenge to Nigeria's funding of glaucoma as POAG is common above age 35 years. This translates to more IWG for glaucoma treatment for as long as they live. Generally, human medical care needs are more towards the last years of life which on average is more than 25%

of acute health care costs spent by each individual throughout life (Wanless 2002, p. 16).

Remarkably, this rather is useful information to estimate the number of citizens that would plausibly require glaucoma care rather than a serious challenge to its funding.

Furthermore, the opponent may oppose glaucoma funding for **fear of likely rising cost of glaucoma treatment over time**. The rising costs can occur from advances in equipment for early detection, investigating and monitoring the IWG as well as novel drugs and techniques in treating glaucoma. There would be complementary manpower training to manage new equipment and treatments with plausible increasing cost of glaucoma treatment. Of course, the IWG would challenge Nigeria's healthcare to do more through their increasing expectations assuming right to free and comprehensive healthcare.

Nonetheless, advances in glaucoma management are signs of development towards the IWG's and public good. Arguably, new technology may even be more cost effective, proven cost benefit, cost saving and eventually plausibly without serious challenge to public funding glaucoma treatment. Glaucoma funding can stimulate advocacy for universal funding of other diseases of public health importance with eventual benefit to society because healthy citizens would plausibly be productive, thus helping the nation. Funding would plausibly create job opportunity for many jobless Nigerians because there would be need to recruit manpower for glaucoma treatment.

Additionally, opponent may oppose public funding of glaucoma treatment in Nigeria because of **necessary accompanying rising overall remuneration of personnel** that would be engaged to deliver glaucoma treatment. Public funding of health conditions is associated with changes in

spending. For instance, the proportion of NHS budget on secondary care has decreased while more are now spent on primary care and preventive medicine. Also, more than half of all NHS resources is spent on salaries (Newdick 2005, p. 3), and, particularly General Practitioners, these have increased above the rate of inflation in recent years. Furthermore, clinical negligence claims represent a significant drain on NHS funds.

Finally, the problem of healthcare funding appears universal as Hall (1994, p. 694) observes that giving a whole population optimal access to healthcare would consume the entire resources of a nation. A study even estimate that providing all the health care that could be beneficial to each French citizen would cost five-and-a-half times France's gross national product (Richard D Lamm, cited in Jackson 2013, p. 36). It is impossible to give what one does not have and remains doubtful if Nigeria, a resource-limited economy, can afford qualitative glaucoma treatment for its citizens. However, this appears a pessimist and defeatist position on a vital health issue because every worthy cause has its own price. Definitely, funding glaucoma would not be without its challenges but the gain in preserving the IWG's dignity is invaluable.

2:7 Conclusion

The chapter analysed the alleged factors against public funding glaucoma treatment. The opponent argued against funding relying on complexity of glaucoma disease, the anti-glaucoma drugs' side effects, poor level of glaucoma awareness and education among Nigerians, inadequate resources for glaucoma care, relative low priority of glaucoma to other diseases

from QALY and utilitarian considerations, the cost implication of glaucoma treatment and the capability of Nigeria to fund it.

Nonetheless, public funding glaucoma is a worthwhile venture in view of treatment potential to preserve life-long useful vision which facilitates the IWG's dignity enabling flourishing life. The complexity of glaucoma should rather attract funding than non-funding. Rather than rejecting a deserved glaucoma funding on discriminatory and inhumane grounds of QALY and utilitarianism, a reasonable compromise should be a public funded glaucoma and other diseases of public health importance through a general health insurance policy. A two tiered healthcare that hopefully would address this proposal is further discussed in Chapter Four. An appropriate management of Nigerian resources would enable it to fund required social services including universal healthcare. Therefore, the opponent's allegation that Nigeria lacks economic capability to fund glaucoma treatment is not genuine and only occurs because of mismanagement. Importantly, vision is priceless and necessary to flourishing life. Meanwhile, Chapter Three analyses harms of glaucoma impaired vision which further underscores the necessity for public funding glaucoma treatment.

Chapter Three

Harms of glaucoma: Arguments for Nigeria's funding glaucoma

3:1 Introduction

Glaucoma adversely affects visual function impacting negatively on the IWG's flourishing life. Unlike Chapter Two which analyses arguments against funding glaucoma, this chapter argues for public funding glaucoma. The arguments consider the plausible glaucoma's harm to the IWG through impaired visual function especially its adverse effects on their daily activities, health, education, work, economy and overall harm to Nigeria.

3:2 Glaucoma impairs visual function

Glaucoma relentlessly interferes with domains of visual function including central vision, peripheral vision, colour perception, stereoacuity, and contrast sensitivity. Regrettably, glaucoma impaired visual function is irreversible and adversely affects quality of life (QOL). In a Nigerian study comparing 132 IWG with controls (persons without glaucoma), Onakoya et al. (2012, pp. 287–295) report glaucoma does affect QOL. The study shows that the IWG do have reduced QOL as defined by the two instruments used. Early or mild glaucoma is associated with reduced QOL compared with the controls.

The highlights of the way glaucoma affects the QOL among Nigerians by the study include greatest difficulty with glare and dark adaptation. These can make driving not only horrible for glaucomatous motorists but can lead to accidents especially while driving at night. Such motorists would rather experience blur distant vision because light rays from oncoming vehicle are scattered leading to poor visibility on the road. Also, the study affirms correlation between increasing visual field defect and worsening QOL. Worsening visual field is dreaded in glaucoma because it signifies the progression of optic nerve damage and bad outcome for vision. Nonetheless, not all the IWG would experience severe visual field loss.

Furthermore, the contrast sensitivity correlates moderately with QOL among Nigerian IWG. Impaired contrast sensitivity in a progressive glaucoma implies difficulty in reading or in differentiating between objects which have distinctive features. For instance, an IWG may have difficulty differentiating between among others deep blue and light blue objects. This unnecessarily makes the entire life unreal and annoying.

Additionally, the report indicates the cup-to-disc ratios, visual acuity, and visual field indices correlate with the QOL. This implies higher cup-to-disc ratios, worsening visual acuity and progressively narrowing visual field are indicators of deteriorating visual function with negative impact on QOL.

Importantly, the study among Nigerians affirms that POAG, the commonest type of glaucoma in Nigeria, reduces the QOL even in the early stages of the disease, as there is a significant reduction in the QOL of the IWG with mild glaucoma compared with the controls. There is a

clear trend of worsening QOL scores with increasing severity of disease. The study has clinical worth in view of the correlation observed between the QOL scores and objective measures of visual function. Moreover, it should have appeal in Nigeria's funding glaucoma treatment. The study establishes that glaucoma affects various domains of visual function in Nigerian IWG.

Elsewhere, there are studies in concordance with lessened QOL findings among Nigerian IWG. For instance, McKean-Cowdin et al. (2008, pp. 941-948) report greater severity of visual field loss in persons with open angle glaucoma with adverse impact on vision-related QOL. The impact was noted in persons who were previously unaware that they had glaucoma.

The authors hold that a prevention of visual field loss in the IWG is likely to reduce loss of vision-related QOL. This essentially is the basis for glaucoma treatment which is achievable if and only if there is early diagnosis and strict compliance to an effective glaucoma treatment. It is most likely compliance to glaucoma treatment would markedly improve should public fund glaucoma treatment. This would go a long way to reduce the burden of blindness from glaucoma in Nigeria. Glaucoma treatment compliance is most unlikely among indigent IWG in an open market healthcare system.

Equally, in a study among individuals with ocular hypertension or POAG, van Gestel et al. (2010, pp. 1759-1769) report that visual field loss in progressing glaucoma is independently associated with a loss in both disease-specific and generic QOL. The study holds that it is important to prevent progression, both in early and in advanced glaucoma, especially in the IWG with

inferior hemifield defects and severe defects in either eye. Furthermore, the study notes that visual functioning and generic QOL is lower in severe glaucoma than in mild glaucoma.

Glaucoma treatment slows down disease progression, but may have its own effect on the QOL. Though, uncommon, a glaucoma treatment that adversely affects the QOL is a setback to effort at preserving flourishing life in the IWG. However, it may be related to side effects of anti-glaucoma drug therefore, anti-glaucoma prescription should be reviewed periodically to detect and resolve intolerable side effects. It is counterproductive for an anti-glaucoma drug to prevent harms of glaucoma and concurrently produce side effects that negatively affects the QOL.

Furthermore, Evans et al. (2009, pp. 433), report that the QOL is impaired to a similar extent by diseases associated with peripheral visual loss (glaucoma) and central visual loss (age related macular degeneration – ARMD), but different domains are affected. In contrast to ARMD, mental aspects (such as cognition, emotion) appeared to be affected more than physical aspects in the IWG. Furthermore, Evans et al. observe that the differential impact upon the QOL might be a function of the pathology of the disease, for example potential for blindness and better ability to perform physical tasks due to retention of central vision may explain these observations in glaucoma.

In their study, Hyman et al. (2005, pp. 1505-1513) observe that open-angle glaucoma is a leading cause of visual impairment worldwide and that the visual impairment caused by glaucoma can affect the QOL and functional ability, especially in individual with severe glaucoma.

The aforementioned studies variously indicate glaucoma interfering with visual function and beneficial effect of glaucoma treatment on visual function even if only marginal visual function improvement in the IWG. Besides, it is instructive from these studies that preserving good vision in the IWG has high hope in sustaining general health related QOL. Meanwhile, section 3:3 analyses the implication of glaucoma interfering with visual function on daily activities and health, education, occupation and economy.

3:3 Harms of glaucoma to daily activities and health, education, work, economy

3:3:1 Daily activities and health

Visual impairment has far reaching implications on human lives. A visually impaired has difficulty coping with basic daily activities: movement around in the house, cooking, eating, toileting, bathing and cutting of nails. A blind individual may unknowingly wear untidy clothes. The most severely affected activities by visual impairment include driving, reading, threading needle but most would still cope with feeding and wearing of clothes (Ayanniyi et al. 2013, pp. 21-29). Limitations to normal daily activities essentially make life miserable, and uninteresting.

Glaucoma can interfere with the IWG's perception of colours, impacting negatively on life activities such as an IWG unknowingly buying overripe banana or being cheated at market by unknowingly paying one thousand naira note (Nigeria's currency) in place of twenty naira note

or shortchanged in a business transaction. The world of an IWG with impaired vision is not real any longer and sadly enough the impaired vision is irreversible. Additionally, glaucoma can impair the IWG's ability to appreciate the dimensions of objects as two or three or misjudge the depth of a space (stereoacuity) leading to an IWG missing steps while moving along the staircase, or enter a ditch while attempting to cross over it leading to injuries.

Generally, visual impairment, its causative disease notwithstanding, is notorious for its negative impact on QOL especially among old people. For instance, in separate studies Kelly (1995, pp. 273-275) and Haymes et al. (2002, pp. 79-91) report difficulties in the activities of daily living as impact of visual impairment among older adults. A study by Ayanniyi et al. (2012) report similar findings among 130 visually impaired Nigerians. The study covers age range 19 to 95 years, representing a general impact of visual impairment across age groups. Also, the study reports glaucoma (29, 22.3%) as second leading cause of visual impairment after cataract (82, 63.1%) underscoring the need for Nigeria to fund glaucoma to reduce visual impairment and its attendant challenges to the IWG' daily activities.

Visual impairment has negative impact on the IWG' health by way of not being gainfully employed leading to inability to afford balanced diet. Nigerian glaucoma blind may suffer malnutrition as she becomes dependent on family (probably too poor to help) and a society without social welfare services for glaucoma blinds leading to untoward hardship. Lack of balanced diet can predispose to diet related diseases including malnutrition leading to low bodily immunity then, infection.

Moreover, a visually impaired may have challenges in maintaining personal hygiene for instance cutting finger and toe nails. Furthermore, a blind would not detect contaminated meals or drinks which on consumption cause diseases. Visual impairment caused by glaucoma would be taxing for an individual who has been leading a very active life as it predictively exposes to a life of inactivity, boredom, obesity, social isolation and loneliness (Wang et al. 2008), lower life satisfaction, anxiety, depression and suicide (Renaud and Bedard 2013, pp. 931-943). Cognitive impairment, dementia and increase mortality are not rare after becoming blind (Wang et al. 2014, pp. 79-94). Evans et al. (2008, pp. 1428-1433) have reported increase need for residential or institutional nursing care and increase use of health care services among visually impaired. This undoubtedly underscores economic burden caused by glaucoma.

Following visual impairment the estimated loss of wellbeing is staggering; an Australian 2004 study estimated loss of wellbeing attributable (years of healthy life lost as a result of disability, YLD) to visual disorders was 40 068 years, and the net cost of loss of wellbeing was 4.82 billion AUD (Taylor 2006, pp. 272–275). Moreover, many studies have reported falls, hip fracture and other accidents among elderly visual impaired (Ivers et al. 1998; Patino et al. 2010; Lopez et al. 2011). Treatment of elderly visual impaired for wounds and bone fractures is not only daunting but an added cost.

Remarkably, neither all the IWG experience glaucoma's adverse effects in equal proportion nor glaucoma is solely responsible for adverse QOL in many IWG with impaired vision. It is possible the IWG have comorbidities that even put them in severe distress than only glaucoma impaired vision would suggest. Nonetheless, it is plausible that should such IWG have no added visual

impairment the nasty experiences would have been lessened. On aggregate, to make life worthwhile for all, that is those IWG who would be facing only the challenges associated with glaucoma impaired vision and those who may be unfortunate to have comorbidities, it is reasonable to prevent glaucoma impaired vision through public funding glaucoma treatment in Nigeria.

3:3:2 Education

The development of a society is related to its level of literacy. Good sight is a prerequisite learning tool because learning and vision are inseparable entity. Estimate indicates that 80% of what we learn comes through the visual processing of information (Parker 1989; Glezer 1995; Zeki 2005). Learning is an important visual taxing activity that has far reaching effect on human and world development. Learning activities such as reading, writing, or demonstration depend on normal visual function: visual acuity, visual field, colour perception, depth perception and contrast appreciation. Through normal visual function the learners can appreciate what the teachers write, draw or demonstrate.

Glaucoma impaired vision is a serious challenge to learning and known cause of poor academic performance and out right school drop outs across the globe (Jose et al. 2008, p.21). This necessarily affects the IWG self-development through learning. An IWG may have difficulty recognizing colour contrasts such as black letters on a white background or colour prints against various coloured background, a situation which negatively affects learning. The aggregate

impaired educational developments of the IWG translate to huge loss to Nigeria by way of loss in productivity and development.

Glaucoma has no respect for students for instance, in a survey of ocular health among school children in Ilorin, Nigeria, Ayanniyi and colleagues (2008, pp. 137-140) report features of glaucoma among eight pupils, one of whom had already lost vision to glaucoma in one eye. The pupil was eight years old at the time of the survey and would face long blind years in case she loses vision in second eye. Being blind from glaucoma at a very tender age has negative implication on the pupils' education especially in a resource-limited Nigeria. It would be as bad as dropping out of school and remain illiterate, unfulfilled life dreams, becoming socially dependant, and even suffer untimely death. Should there be a Nigeria's funded glaucoma treatment in place the pupil would have benefited from such which would have saved her, her family and society from adverse impact of glaucoma.

Equally of concern is the fact that most Nigerian schools do not conduct pre- and post-school admission eye screening (test) for the pupils (Ayanniyi et al. 2015, p. 138) otherwise, the glaucomatous eye should have been detected and treatment instituted ahead of the pupil going blind. However, the parents probably might have not been able to afford or sustain her glaucoma treatment underscoring the need for Nigeria's funding glaucoma treatment to prevent avoidable glaucoma blindness and its impact on Nigerians.

3:3:3 Occupation

Glaucoma impaired visual function has serious implication on career choice and/or survival in a chosen vocation. The IWG who suffer from impaired colour vision would not be able to sustain careers in vocations that require the recognition of colours to flourish as professionals. For instance, the vocations such as graphic art, creative art, and driving (Cole 2005; Cole 2008) require working with colours. Similarly, chemistry teachers and students as well as Nigerians engaged in traditional dye industry may not be able to cope with their work should they suffer from glaucoma impaired colour vision. Glaucoma colour vision defects may require affected professional to quit the job which necessarily exposes the IWG to further challenges occasioned by abandoning means of livelihood.

On the other hand glaucoma colour vision defect in a driver may endanger many lives including the driver, passengers and unlucky passers-by. Imagine a glaucomatous driver who has impaired colour vision, making him to mistake a red traffic light for green; such mistake can cause an accident that would claim many lives. Suppose such driver continues driving to cross a rail line when he actually supposed to stop for an oncoming train to pass, such would lead to an inevitable fatal collision of train with the vehicle causing human and material losses. This graphic illustration is much more relevant to Nigeria where traffic indicators at many road and rail crosses may be defective. Glaucoma colour vision defect would have taken many lives in such a terrible accident. Equally, a glaucomatous driver who suffers from constricted visual field may also cause a problem of similar magnitude especially at a T-junction, such driver would not

be able to appreciate any oncoming vehicle from either side of the road and this may lead to an accident.

Regrettably, many Nigerian drivers are not aware they have glaucoma or sometimes evade standard motor driving licensing test (Oladehinde et al. 2007; Adekoya et al. 2008) even when they are aware of their impaired vision (Ayanniyi and Chikwe 2012, p. 41). In a study to determine the eye health status among 42 male Nigerian drivers, Ayanniyi and Chikwe (2012) report that only 4 (9.5%) ever had eye test to obtain motor driving license. Notably, the study observes that good vision is essential for driving to enable a driver to judge distance, to read road signs and appreciate the traffic lights and to respond appropriately to challenges on the road while driving.

Moreover, an ethical dilemma has been reported by some Nigerian ophthalmologists in a middle-aged driver and co-staff of the same institution who is visually impaired by an advanced glaucoma yet driving institutional automobiles (Okoye et al. 2009). The implication of the report though, regrettable, is that many anonymous visually impaired glaucomatous drivers are driving on Nigerian roads. It is plausible that many accidents on Nigerian roads are caused by such drivers who might have been visually impaired by glaucoma. Generally, health conditions that affect motorist's well-being can be costly to society. For instance, Andreas Lubitz, a copilot allegedly crashed Germanwings in French Alps killing all 150 people on board having suffered from suicidal depression and unknown eye disease (Sawer 2015).

Furthermore, farming is important to Nigeria's economy. The Nigeria's population is skewed to rural areas with over half of Nigerians being engaged in farming activities. Glaucoma impaired

visual function in farmers does interfere with farming activities. One can nostalgically recall a farmer who suffers from glaucoma impaired visual function and presented in our clinic and who included in his complaints that he sadly, ended uprooting half of his planted crops while weeding his farm as he could not properly identify and separate planted crops from the weeds. Regrettably, glaucoma was at its advanced stage and medical treatment could not assist the farmer again. Many farmers across Nigerian communities suffer from glaucoma with its associated impaired visual functions. The aggregate of farmers who are rendered non-productive by glaucoma blindness is a set back towards achieving food sufficiency because it depletes capable manpower for food production.

Disturbingly, virtually every vocation is affected when individuals engaged in such specific occupations have impaired visual function. In a study among 130 visually impaired Nigerians - 22.3% caused by glaucoma - Ayanniyi et al. (2013, p. 27) report reduction in the workforce for public service, farming and artisan following visual impairment. The driving and teaching vocations were absolutely affected by visual impairment and both increased the magnitude of dependants forty times. Remarkably, many blinds especially indigent glaucoma blinds end up leading a miserable life and often resort to the street begging for alms to survive.

3:3:4 Economy

Another notable reason for Nigeria to fund glaucoma treatment is huge economic gain that can accrue from preventing glaucoma blindness. In the first instance, an IWG who enjoys near

normal vision would be able to flourish, be productive and contribute to the economy rather than becoming a dependant. A blind IWG is essentially visually handicapped and would need assistance to survive. For instance, it necessarily costs more to provide same quality of education given to sighted individuals to glaucoma blinds because it would require specialized resources. Nigeria would gain money by preventing the IWG going blind through funding of glaucoma treatment. Frick and Foster (2003, p. 6) report that lost vision accounts for estimated 7.5 billion USD in annual lost productivity globally.

In the same vein, a blind IWG is essentially a dependant who rather than contribute to the economy depends on family and society. The living expenses of the blinds have to be borne by family and society and even, in exceptional cases where glaucoma blinds are endowed to cater for their living expenses, such would still require people's assistance for services they could ordinarily have rendered to themselves. Often, Nigerian indigent blinds beg for alms because there is no reliable social security system for the blind.

Meanwhile, of serious public health and economic concerns is the fact that glaucoma is Nigeria's leading cause of irreversible blindness. This is so because glaucoma prevalence is on the increase proportionately to increasing total and elderly populations. In a study on 'economic impact of POAG in Australia' Dirani et al. (2011) observe that the prevalence of glaucoma in Australia is expected to increase from 208 000 in 2005 to 379 000 in 2025 because of the aging population. This has implication on glaucoma treatment as estimate indicates that health system costs over the same time period increased from 355 million AUD to 784 million AUD. Equally, total costs (health system costs, indirect costs and costs of loss of well-being)

would increase from 1.9 billion AUD to 4.3 billion AUD. The finding is instructive and relevant to Nigeria in view of its equally growing and aging population because it would be cost-effective for Nigeria to fund glaucoma treatment than to allow it untreated and risk plausible huge economic loss from necessary blindness.

Similarly, Nigeria's funding of glaucoma treatment plausibly would save the society huge financial burden if one extrapolates Kymes et al. (2010) findings to Nigeria. They report that over the people's expected lifetime, the cost of managing visually impaired POAG individual is higher than people without glaucoma by 1688 USD or approximately 137 USD per year. This probably, is due to the fact noted in the study that compared to other Medicare beneficiaries, glaucoma diagnosis was not found to be associated with significant risk of comorbidities before the development of visual impairment. Thus, glaucoma related visual impairment is better prevented as it necessarily pushes the IWG into further additional health or financial stress.

A good reason for Nigeria to fund glaucoma treatment is the plausibility of reducing the cost of glaucoma treatment. It can be argued that the cost per any particular product can be reduced if such product is mass produced. The cost of such product can even be further reduced if there is a projection into the future and the raw materials for such product are purchased in bulk. This can be true in such situations when the raw materials are storable or non-perishable and where inflation is increasing or stable. Suppose the average cost of anti-glaucoma drugs to an average IWG is £20 (N6 000) per month in an open market. It is possible to markedly reduce such amount, say by half (£10, N3 000), should Nigeria decides to bulk purchase. Alternatively, cost reduction is plausible if Nigeria purposefully establishes pharmaceutical plants or encourages

local production of anti-glaucoma products. Nigeria domestication of companies producing anti-glaucoma products promises further benefits including job opportunities and taxes that can boost Nigeria's economy.

Similarly, Nigeria can get a price reduction or payment deferment by partnering with companies producing anti-glaucoma drugs and equipment. For instance, some companies producing laser and optical coherence tomogram (OCT) do partner some eye care facilities globally. Whereas OCT is useful in investigating, diagnosing and monitoring glaucoma; lasers are useful in treating glaucoma only that both are very expensive. A particular laser equipment becomes outdated or inactive after a period of time (shelf life). It would be a win-win situation for both Nigeria and such companies as there would be Nigeria ready market for the products and Nigeria would prevent glaucoma blindness at lower cost.

Regulating the cost of anti-glaucoma products necessarily makes glaucoma more cost effective because the real cost of anti-glaucoma products would be far less than they would have been in an open market scenario. Moreover, indigenous companies producing anti-glaucoma products can boost economy through tax remittance. Should the companies even enjoy tax waiver, many Nigerians would be gainfully employed saving Nigeria the social costs of unengaged yet active citizens especially welfare allowance. Of course, having a secure job is psychologically appealing and can translate to good health to citizens with overall benefit to society. Glaucoma funding would necessarily increase job opportunities for skilled and unskilled Nigerians.

Meanwhile, Nigeria is endowed with conditions that can attract companies engaging in anti-glaucoma products should Nigeria be willing to fund glaucoma treatment through partnership. For instance, Nigeria has land where such company can be sited free of charge, there is cheap skilled and unskilled labour market and a predictable climate. Interestingly, in March 2015 Nigeria voted a new political party into power which holds promise to tackle Nigeria's social ills.

Admittedly, Nigeria has been rendering some social welfare in healthcare such as payment of salary of health professionals in public service, erection and maintenance of public health facilities, training of health care professionals and the establishment of NHIS where government pays large percentage of the insurance fee with only 10% being paid by the beneficiaries. Nonetheless, there is always room for improvement. The society is better when there is improvement leading to development. Nigeria's funding glaucoma treatment would further enhances Nigeria's social welfare rating and add more value to Nigerians' lives.

It is doubtful whether a disease such as glaucoma with frightening indices especially irreversible impaired vision, early and sustained treatment for any visual benefit should be subject to cruel market forces in a country ravaged by poverty and unemployment. Such approach would necessarily expose the vulnerable citizens who cannot afford treatment and Nigeria is worst for it through high burden of dependant blind people on society.

3:4 Conclusion

Untreated glaucoma rapidly destroys visual function domains including visual acuity, visual field, colour vision, depth perception and contrast appreciation leading to impaired vision or blindness. This impacts negatively the IWG's ability to flourish and diminished quality life because of disrupted basic daily activities, health, learning, work, and economy. Glaucoma treatment can prevent glaucoma blindness and its associated negative impacts on the IWG. Glaucoma should be public funded for social justice and huge socio-economic gains.

Chapter Four

Justice and resource allocation: Arguments for Nigeria's funding glaucoma

4.1 Introduction

One of the major issues in glaucoma treatment discussed in Chapters Two and Three is resource for glaucoma treatment. Healthcare resources are finite commodities yet have to appease competing healthcare demands. Unless healthcare resources are fairly distributed, most poor Nigerian IWG would continue to suffer visual impairment and society would be worse for it.

This chapter categorises healthcare resource allocation and provides justice-based arguments for Nigeria's funding glaucoma treatment. The arguments below consider approaches to justice. I will discuss Hippocrates, Marx, Rawls, Aristotle, utilitarianism, egalitarianism, communitarianism, capability theory, well-being and fair opportunity rule. Finally, justice-based healthcare rationing and two tiered healthcare model are discussed. A proposal for general health insurance funded tier-one of the two tiered healthcare that provides universal cost free basic healthcare for diseases of public health importance including glaucoma is made.

4:2 Category of resource allocation

Resource allocation relating to healthcare (including glaucoma treatment) has been categorized; macro-, micro- and, in-between the two, meso-allocation (Gillon 1975, p. 266). Macro-allocation involves the budgetary distribution of national resources to different sectors of life for instance, health, defense, education. Advanced economies such as the UK and the US have huge health budgets compared with poor economies. For instance, in 2014/2015 the UK NHS budgeted £113.3 billion (NHS Budget 2014) and the US allocated 26% of its \$3.9 trillion 2014 budget to health (US Federal Budget Analyst 2014).

Contrariwise, Nigeria, a resource-limited economy allocated a paltry 5.6% of its N4.962 trillion (£16.6 billion) 2014 budget to health (Thisday 2014). Interestingly, the NHS 2014 budget is almost seven times aggregate Nigeria's 2014 budget. Poor budgetary allocation to health is bane to healthcare development in Nigeria. Nigeria can accomplish improved healthcare delivery by increasing health budget through macro-allocation.

A meso-allocation is the sharing of budgetary allocation among the divisions of a given sector. For instance, the distribution of health budget to various health divisions such as public health, women health, children health, eye health. A situation where Nigerian state is willing to fund glaucoma treatment would mean additional resources (for glaucoma care) would be deployed to eye health at meso-allocation stage of resource distribution. Meso-allocation also includes decisions on allocation, at health authority level, for competing medical and other healthcare

claims and decisions within a hospital on how to allocate between competing specialties and firms.

A micro-allocation is rationing of resources within a given subsector in view of finite resources and competing demands. Rationing refers to the 'discretionary allocation of scarce resources, with deprivation generally distributed unevenly across society' (Jackson 2013, p. 36). It can be allocation between two IWG or diseases for instance, funding glaucoma treatment in an IWG at its early stage (high benefit) rather than an IWG at its late stage (doubtful benefit) or funding glaucoma treatment instead of cataract. Rationing aims at judicious use of resources. Although complex and taxing, resource allocation decision to healthcare is based on moral assessments of how competing claims can be fairly resolved especially based on justice (Kushe and Singer 2006, p. 401).

Many criteria have been suggested for selecting a beneficiary such as an IWG for micro-allocation for instance, Rescher (1969, cited in Kushe and Singer 2006, p. 402) suggests five distinct primary criteria including relative likelihood of success of treatment, life expectancy of the IWG, family role of the IWG, potential contribution to society and past services rendered. Rescher's criteria have their own merits and demerits; while likelihood of success would be useful to take decision in situation of scarce resource, not all cases would merit unambiguous categorisation, a life expectancy criterion may necessarily discriminate against the elderly, thus the criteria are not necessarily objective. This is so as a-15-year-old boy who needs antibiotic to treat bruises on his leg, which would cause no death, would be preferentially treated, because of his long life expectancy, instead of using the same antibiotic to cure a-75-year-old man (short

life expectancy) of a life threatening pneumonia. A reasonable decision should have been to use the only available antibiotic to save the elderly man.

Moreover, there are diverse opinions on criteria for micro-allocation; some hold that plausible length and quality of life gained ought to be the deciding moral consideration in allocating scarce resources whereas others would prefer that the scarce lifesaving resource should be allocated based on account of past and/or potential future contribution to society (Kushe and Singer 2006, p. 402). Harris prefers that age is not used to decide resource allocation especially in the individuals below age 70 unlike Veatch, all other things being equal, who argues that based on egalitarian justice, age should be considered in healthcare allocation (Harris; Veatch cited in Kushe and Singer 2006, p. 403). Harris position appears more reasonable than Veatch however, there should not be discrimination in resource allocation even above age 70 because (many) old people have earned their healthcare through their contributions to economy during their working years.

Furthermore, Gillon (1975, p. 266) observes that healthcare rationing may be based on a number of criteria such as welfare maximization (the least in age expected to live longer and maximize returns), medical need (the most sick need the healthcare most), merit (the kindest person becomes the beneficiary), partiality (the favourite becomes the beneficiary), fairness (lottery – devoid of favouritism), social worth (the privilege versus the less privilege), and efficiency/efficacy (probability of medical success).

A careful analysis of Gillon's (1975, p. 266) list of criteria for allocating healthcare resources would reveal that partiality is an obvious injustice and the medical need should be a better

criterion for micro-allocation. Medical need correlates with the Marxist criterion for justice- 'to each according to his need'. However, medical needs are also as varied as there are patients. Medical needs may include prolongation of life, elimination of disease and attainment of health, and improved quality of life, in the sense of both reduction of suffering and enhancement of flourishing. These medical needs are not necessarily the same in worth of impact on life however, each patient has to be fairly treated thus, the need for justice in resource allocation.

Nonetheless, a medical need should have impact on health- a state of complete physical, mental, and social wellbeing, and not just the absence of infirmity. Medical need is a necessary criterion for just distribution of medical resources (Williams 1973, pp. 230-49). Like in previously cited example, the medical need for antibiotic in the 75-year-old man who would die without antibiotic treatment for pneumonia far outweighed that of the 15-year-old boy who would survive without antibiotic treatment for his leg bruises.

Glaucoma treatment is a need because untreated glaucoma markedly reduces QOL which is detrimental to the IWG and society. Glaucoma treatment is a fundamental need making it obligatory as without it the IWG are significantly harmed due to interrupted capacity to flourish (an Aristotelian approach). Glaucoma treatment meets the criterion for need because without treatment there can be harm of blindness. The principle of need holds that the essential social resources, including healthcare, should be distributed according to need. Need implies that without it that person will suffer a harm, or at least be detrimentally affected (Beauchamp and Childress 2013, p. 251).

Glaucoma treatment is a necessity and not just a desire (Papanikitas 2013, p. 71). Culyer (2007, pp. 235-236) observes that healthcare need exists if there is capacity for an intervention to enhance health benefits which is derived by comparing the IWG situation with and without treatment. Glaucoma treatment satisfies Culyer's criterion for healthcare need because the IWG's condition would plausibly be worse without treatment.

Regrettably, many Nigerian IWG cannot afford or access glaucoma treatment with consequential impaired vision – a necessary unhealthy state even when an IWG is physically and mentally stable. The Nigerian IWG would largely benefit from glaucoma treatment however, it would be impossible through open market healthcare because IWG would not afford it, causing blindness and adverse effect on society. In the UK the need for healthcare is addressed by the State and funded by means of taxation (Papanikitas 2013, p. 71). Glaucoma treatment is a need and Nigeria should emulate the UK and other nations where health is accorded the deserved priority.

Nonetheless, healthcare resources are finite and cannot satisfy all healthcare needs and wants thus, underscoring ethically defensible way of allocating resources. Unlike diseases that could be reversed following treatment, glaucoma treatment should not be based on ability to pay especially in Nigeria where most IWG cannot afford treatment. Most developed countries have adopted public policies - guided by social welfare and justice considerations - that provide some basic level of healthcare to the poor and other vulnerable groups, who would otherwise die or suffer great harm because they cannot afford to pay for private healthcare insurance or care. This would imply that the developed nations have long realised that the market-orientated way

of allocating healthcare resources is inadequate (Kushe and Singer 2006, p. 401). It is reasonable to believe that open market healthcare has failed to achieve desired healthcare for the people especially the minority poor in advanced nations and it can rarely be helpful in Nigeria where majority is poor.

4:3 Approaches to justice and arguments for Nigeria's funding glaucoma treatment

Nigeria grapples with healthcare inequalities including inadequate healthcare resources, access to healthcare, and diseases peculiarities. Many IWG are not getting treatment mainly due to inability to afford treatment. Because of increasing healthcare cost, the available NHIS is limited in operation and inefficiently serving only a minority group. There is concern about what justice requires of societies and global community on healthcare provisions. The challenge of inequalities and cost are truly concern of justice in health policy and healthcare institutions. The inequalities and cost threaten access to, and proper distribution of, healthcare. For instance, cataract afflicts more Nigerians and its treatment is very cost effective than glaucoma. These inequalities create support for cataract even when glaucoma causes irreversible blindness making it worse than cataract. Also, the inequalities between HIV and glaucoma attract funding to HIV; HIV infection elicits instant fear of death and sympathy unlike glaucoma. The need for justice in healthcare resource distribution cannot be overemphasised.

Currently, most Nigeria's IWG are at the mercy of the market forces leaving many of them not receiving treatment and consequently, suffer costly irreversible blindness. Remarkably, those

who get treated for glaucoma are the selected few IWG who are aware of their glaucoma status and can afford treatment as well as the privilege few that enrolled for NHIS. It is doubtful if there is justice in a situation where many IWG actually need healthcare service but only a few get it. Undoubtedly, a fair healthcare policy that makes healthcare provision for the IWG would reduce the burden of blindness in Nigeria.

It is important to examine the approaches to justice in relation to the Nigeria's funding glaucoma treatment towards reducing avoidable burden of glaucoma blindness among Nigerians. The term justice implies fairness, equitable, and appropriate treatment in light of what is due or owed to persons (Beauchamp and Childress 2013, p. 249). Distributive justice means fair, equitable, and appropriate distribution of benefits and burdens determined by norms that structure the terms of social cooperation (Fleishacker 2005).

4:3:1 Hippocrates, Marx, Rawls and Aristotle

Hippocratic duty holds that prioritizing the common good over the individual is morally wrong.

This is not necessarily correct in situations where individual's good would affect the common good. For instance, an individual may enjoy smoking but many societies banned smoking in

public places because it does not serve common good. However, Hippocratic duty may

advocate treatment for an IWG. The original Hippocratic oath though, has been revised, expects

a doctor to make the care of her patient her first concern. Thus, the care for an IWG should be

the concern of healthcare professionals so as to prevent avoidable blindness. By advocating,

mobilising and lobbying for resources towards glaucoma treatment, the health professional is doing good (beneficence) and preventing harm (non-maleficence) of glaucoma blindness to her patient.

To Marx, justice demands that each should be given according to need and taken from according to ability. The health need of an IWG is glaucoma treatment, that of an individual with cataract is cataract extraction and a hypertensive should have adequate dose of anti-hypertensive medication. Glaucoma should not be considered a less harmful disease to cataract or hypertension because each is harmful to its victim by interfering with the individual's ability to flourish.

Rawls's theory of justice holds that a rational person, who makes a decision behind a veil of ignorance, unaware of plausible beneficiary, will look after the least well-off (Papanikitas 2013, p. 72). Incidentally, poor citizens in the society bear disproportionately bad social indices especially disease burden. It is for public good should the societal poor get treatment support that plausibly enables flourishing life that would improve economy. Many Nigerian IWG are indigents and would benefit from treatment funding.

Similarly, Aristotle exhorts that equals should be treated equally, unequals unequally in proportion to the relevant inequality. This would imply that glaucoma like other diseases should be accorded same treatment status or better, as its effects are grave, if left untreated. Virtually all accounts of justice in healthcare hold that delivery programmes and services design to assist persons of a certain class for instance, the indigent should be made available to all members of that class. It is unjust to deny given benefits to some when others in the same class receive such

benefits. Like HIV, hypertension or cataract, glaucoma is a disease of public health importance in Nigeria and should equally enjoy funding support like others.

4:3:2 Utilitarianism

Glaucoma treatment would plausibly maximize social utility by preventing blindness among the IWG thus making them retain their quality life, being productive and useful to society. A functional vision enables individual to participate in business transactions, free association, and freedom to move around to access available resources. A normal vision enables individual to have healthy interaction with the society and to lead a flourishing life. Though, some blind people lead flourishing lives but blindness in a society with poor social welfare and healthcare supports could seriously impede quality of life. Theories of distributive justice link the morally relevant properties of persons to morally justifiable distributions of benefits and burdens. Glaucoma treatment appeals to the principles of distributive justice from a utilitarian perspective because it has potential to maximize utility or welfare.

Glaucoma treatment would produce the maximal balance of positive value over disvalue (positive utilitarianism) - or the least possible disvalue (negative utilitarianism), if only undesirable results can be achieved. By slowing down the rate of progression of glaucoma, it enhances life-long useful vision in the IWG. This is a positive value as compared to blindness (disvalue) that would occur should there be no treatment. Also, by blocking the plausible negative impact of blindness including economic and social dependence on family and society is

a value over disvalue that makes glaucoma treatment, overall, in keeping with utilitarian principles.

Nigeria's funding glaucoma would have appeal to utilitarian theory. The utilitarian enjoins society to act to maximize welfare for the greatest number, at the least cost. Mill (1969) holds that justice is the most significant and rigorous forms of obligation set by the principle of utility. It is instructive; glaucoma treatment has cost-benefit as the IWG would enjoy useful vision for productive purposes. Being able to work would translate to capacity to support self, family and society by being able to pay tax. All these would necessarily be impossible in a blind individual in Nigeria and such individual rather depend on family and/or society. Overall, there is economic benefit in glaucoma treatment.

4:3:3 Egalitarianism

Egalitarianism is another important approach to justice that would be relevant to Nigeria's funding glaucoma treatment. In an egalitarian society an individual is viewed as equal to the other in certain respects. Here egalitarianism principally is not about equal sharing of all social benefits to all persons but rather identifies basic equalities while permitting some inequalities (Beauchamp and Childress 2013, p. 257). The glaucoma can be equated with other diseases such as malaria and HIV for public funding as all plausibly can prevent their victims from achieving their life goals or make their life worth less without treatment. The inherent natural history of glaucoma is distinct from that of malaria or HIV or cataract. These are necessarily

inequalities among these diseases yet the IWG can equally enjoy the social benefit of public support for treatment just like any other diseases being supported by society.

Justice is about a judgment of equal respect for persons and fairness to help us establish principles of justice. The IWG would earn equal public respect as individual with malaria or HIV if and only if there is support for glaucoma treatment just like it is done for HIV. Rawls (1999, p. 52-58) submits that impartiality should satisfy two fundamental principles including first, permitting an individual the maximum amount of basic freedom compatible with a similar measure of freedom for others. The second, social inequalities must satisfy two conditions: one, inequalities in social primary goods may be allowed, but only if they benefit everyone ('the difference principle') and two, social offices and positions be open to all under circumstances of fair equality of opportunity – 'a fair opportunity rule'. While Rawls considers justice in nations and social institutions, Daniels (2007) argues for a just healthcare system based primarily on these principles, with a special emphasis on what Rawls called 'fair equity of opportunity'. Daniels observes that health care needs are special and that fair opportunity is central to any acceptable theory of justice.

Nigeria healthcare allocation that adversely affects glaucoma treatment thus should be revised, as far as possible, to allow each IWG to achieve a fair share of the normal range of opportunities present in Nigeria. The society has duty to remove any obstacle to fair equality of opportunity including activities towards correcting disadvantages (Daniels 2007).

Glaucoma remains and should be viewed as undeserved restrictions on the IWG' opportunities to realize basic goals. The glaucoma treatment is needed to achieve, maintain, or restore

adequate levels of functioning so that the IWG can realize basic life goals. Nigeria healthcare system should be designed to meet these needs in order to prevent loss of visual functions that would reduce the range of opportunity open to the IWG. The allocation of healthcare resources, then, should be structured to ensure justice through fair equality of opportunity (Daniels 1985, pp. 34-58; Daniels 2007). Their social indices notwithstanding, the IWG should have equal access like individuals with other diseases to basic healthcare.

4:3:4 Communitarianism

On its own, the communitarian theories of justice prefer common good over individual interests, and have little regards for theories based on individual rights and contracts. It rather sees society as being built around the general welfare, to common purposes, and to education in citizenship. The social groupings and agreements towards common good have appeal to communitarian theories (Sandel 2005). Taylor (1979, pp. 39-62) challenges the concept of human good making individuals' rights priority over communal decision making as if individuals are separate entity existing independently of communities. Even the type of autonomy suggested by individualism, Taylor argues, cannot be developed in the absence of the family and other community structures and interests. Communitarians regard principles of justice as pluralistic, deriving from as many different conceptions of the good as there are diverse moral communities. What is owed to individuals and groups depends on these community-derived standards (MacIntyre 1988, pp.1, 390-403).

A communitarian policy should support a public funding of glaucoma treatment rather than individual being exposed to market forces that would not assist many indigent IWG. The outcome of the treatment would be for the common good. The healthcare allocation policy should be one in the common interest rather than in individual's interest. Callahan (1987, pp. 104-14) holds that there should be public policy from a shared consensus about the good of society rather than on the basis of individual rights. Glaucoma treatment should be a concern of a good society. It is beneficial should Nigeria notices and tackles the harms of untreated glaucoma through public funding glaucoma treatment.

4:3:5 Capability

Uniquely, capability theory of justice advances ten core capabilities that correlate with a worthwhile life underscoring reasonableness of Nigeria funding of glaucoma treatment because vision is important to the ten core capabilities. The capability is a state of proper functioning and well-being which are of basic moral significance. This theory was pioneered by Sen (1993, pp. 30-53) and developed by Nussbaum (2007, pp. 81-379) who uses the theory to address 'social justice' and the 'frontiers of justice' - the latter including justice for the disabled, the globally poor, and nonhuman animals. The capability theory holds that a minimal level of social justice requires 'the availability to all citizens of ten core capabilities', as follows (Nussbaum 2007, pp. 76-401; Nussbaum 2008, p. 351).

The first core capability concerns itself with life and entails ability to live a normal life, achieving a fulfilling life and a life worth living. Glaucoma treatment would plausibly enhance a normal life in the IWG because blindness adversely affects normal life. The life becomes sub-normal following a compromised visual function and affecting IWG's quality life. A glaucoma blind is plausibly not leading a worthwhile life because life dreams are disrupted. Blindness predisposes an IWG to morbidities which are risks to shortened life span. Moreover, the second core capability is bodily health including good health, nutrition, and shelter which are basic needs in life for normal individual. Glaucoma has capacity to interfere with the IWG's ability to flourish through impaired vision - a state of un-wellness. It predisposes to poor nutrition as the blind IWG is unable to cope with means of livelihood consequentially, inability to afford a balanced diet. Equally, due to the same economic loss, the IWG would be unable to afford house rent. Glaucoma treatment necessarily saves the IWG the troubles associated with untreated glaucoma.

Additionally, the third capability borders on bodily integrity by having capacity to move around freely, self-protection against violence, enjoy sex and free to procreate. While glaucoma blind can procreate regrettably, has lost sight to move around without a guide. Equally, the power to secure self against violence is also compromised. A glaucoma treatment that prevents visual deterioration to blindness would preserve bodily integrity of the IWG. Fourthly, there is capacity of senses, imagination, and thought. An individual should be able to use these capacities in an informed and human way aided by an adequate and diverse education and in a context of freedom of expression. Notably, the IWG have intact senses (but impaired or lost

vision), imagination and thought. However, a person with glaucoma-related visual impairment is limited in the use of these endowments. Of course, further education is more taxing and requires additional support that would be unavailable to many IWG. Nigeria's funding could prevent these possible difficulties.

Fifthly, there is capacity of emotions. This requires being able to have emotional attachments to things and people so that one can love, grieve, and feel gratitude without having one's emotional development blunted by fear, anxiety, and the like. Glaucoma blind can be emotionally affected, for example by depression, regret. This would be so because glaucomatous blindness is irreversible and there is no hope for visual recovery. The unmet life goals requiring normal vision would be regretted and many IWG may experience frequent emotion upset. Many who have lived independent life would find it difficult to transit to dependency while still active especially having to depend on relations. This plausibly predisposes to depression, suicide or death. The sixth is the capacity of practical reason. This has to do with conception of the good and being able to critically reflect on planning one's life. Health is a complete state of physical, mental and social well-being and not merely the absence of infirmity. The IWG, though, otherwise well, is unhealthy in the real sense of health. Life would be seen differently to a visually impaired and such life would be second-rated because life ambitions are limited to what are achievable with impaired vision.

The seventh is the capacity of affiliation. This requires capacity for meaningfully association with others, with self-respect and without undue humiliation. Transition from sighted to blindness is a challenge that the IWG would find difficult to cope with as it tells on the IWG's

entire life, worse still if such IWG had enjoyed active life. There would be unplanned restriction in social interaction for instance, being unable to drive a car to work or unable to attend social events like party, meetings because life becomes awkward and clumsy. It is not unusual for some glaucoma blinds to suffer stigmatization. For instance, a blind is stigmatized a 'sinner' because of erroneous cultural belief that blindness is a punishment for the sin committed or a blind may be stigmatized as unfit for marriage by prospective partner for fear of blindness being communicable or transmissible. The peers would no longer be able to keep company of the IWG. For instance, a blind IWG would necessarily not keen in joining her peers to visit a popular tourist site because the event is largely sightseeing.

The eighth is the capacity for other species which entails being able to live with concern for animals, plants, and nature generally. A glaucoma blind would be unable to appreciate the beautiful natural environment including landforms, plants and animals diversities. However, some may find useful pet animals to keep them company or as guide though, most Nigerians do not keep pet animals.

The ninth is capacity to play and entails being able to play and enjoy recreational activities. Certainly, sports and recreational activities depend largely on normal vision. The glaucoma blind obviously would necessarily be unfit to participate in most sporting or recreational activities. A blind IWG would only be able to do limited or restricted sporting or recreation if any at all. The tenth is the capacity to have control over one's environment. This would require being able to participate as an active citizen in political choices pertaining to one's life and property. Certainly, this would be compromised in blind individuals.

Interestingly, each of the ten capacities is basic to human dignity below which life would have little meaning in the real sense of it. The human natural capabilities should be developed in order to achieve the humanly possible goals that would make life meaningful including education, vocational skills, wealth creation and health care (Beauchamp and Childress 2013, p. 260). Undoubtedly, a disabling state precipitated by disease such as glaucoma would be a limiting factor towards developing or executing the human's capabilities.

It is reasoned by Nussbaum (2007) that the ten capabilities are essential to flourishing and must be socially sustained and protected- they are minimum requirements of justice. Justice demands that society should not obstruct the individual's development of her core capabilities but rather, the society should provide enabling environment to accomplish them. This is done through the provision of resources for decent living including healthcare. The purpose is to encourage individuals achieve their set goal while living their own life. A treatment of glaucoma would plausibly enable the IWG to achieve their set goal and live their chosen life. The justice entails restrain from being a stumbling block to a person's flourishing and genuine support for person's attempt to flourish (Nussbaum 2011, p. 237-38).

4:3:6 Well-being

Another important theory of justice is well-being theory. The well-being is a product of the capacity theory through development of abilities and opportunities. The well-being theory concerns itself with social justice. Powers and Faden (2006, pp. 16, 37) hold that 'social justice is

concerned with human well-being'. They argue that a theory of social justice should be concerned with six core dimensions of well-being: health, personal security, reasoning, respect, attachment, self-determination. It is a list of essential core dimensions of well-being, rather than a list of core capabilities. Being healthy, being secure, and being respected are desirable states of being, not merely capabilities or functioning. An IWG is not in a state of well-being if there is associated compromised quality of life caused by impaired vision or outright blindness. An IWG is denied justice should the society fail to provide healthcare support that plausibly would prevent/delay visual loss and its associated negative life impact.

Justice would enable individuals to acquire adequate dimensions of health, personal security, reasoning, respect, attachment, self-determination towards achieving well-being. While each of these six dimensions on its own enables justice, it also collaborates with others to enhance justice. The justice of health policy in societies and in the global order can be judged by how well these dimensions are implemented.

Justice would be done to IWG when Nigeria funds glaucoma enabling IWG to be in a state of well-being. Powers and Faden see the major problem of justice as reducing inequality in international health, especially reducing the role that poverty plays in causing and perpetuating poor health. The level of inequality can be reduced by the state through the provision of quality but affordable education and employment opportunity. Then, the major concern would be the right to health, not the right to healthcare.

It should be noted that the success of health as the first among the six dimensions of well-being would rely on the other five. They are essentially interdependent. The absence of any of the

other conditions can be seriously destructive to health. Moreover, the moral justification for health policies depends as much on the other five dimensions of well-being as it does on health (Power and Faden 2006, pp. 64-79).

Public funding glaucoma treatment would enable justice in access to healthcare as many IWG would not simply do because they could not afford treatment. A public healthcare system that provides the basic glaucoma treatment would save many Nigerians from losing their vision. A basic treatment can concurrently exist with superior care for those who wish and can afford it but without necessarily being superior in final visual outcome compared with basic care. However, there should be equal access, free choice, social efficiency, and well-being for all.

4:3:7 Fair-opportunity rule

On a different note but equally rational argument on justice, glaucoma can be described as disadvantageous property that the IWG never choose or wanted. It is more of biological lottery which the IWG have no control over. Equally, people have no control over the colour of their skin; they just found themselves as Whites or Blacks.

'Fair-opportunity rule' holds that the social benefits, glaucoma treatment for instance, should not be given or denied individuals on the basis of undeserved advantageous or disadvantageous properties respectively when acquisitions of such properties are beyond their control. There is no moral basis to discriminate between persons in social allocation in properties distributed by

the lotteries of social and biological life if people do not have a fair chance to acquire or overcome those properties (Beauchamp and Childress 2013, p. 263).

Glaucoma is transmitted either genetically or sporadically, implying that the IWG have no control over how they get glaucoma. By fair-opportunity rule, Nigeria cannot discriminate but provide effective treatment for glaucoma like any other disease being favoured for treatment. It would be unjust for a society to provide basic education to normal children and deny comparable education to the disabled children notwithstanding its higher cost. Such argument is true in health care and the fair-opportunity rule requires that the IWG receive healthcare that would ameliorate the unfortunate effects of life's lottery. This enables the IWG to maintain a suitable level of function and to have a fair opportunity in life. As Nigerian IWG are not responsible for their glaucoma, the fair-opportunity rule demands that they receive help to reduce or overcome the unfortunate effects of life's lottery of health.

In Nigeria, the primary economic barrier to healthcare access is inadequate insurance or funding for care. The available NHIS though, inadequate, service only privilege minority and majority either pay out of pocket for health or remain untreated. There is a need for a social consensus with all Nigerians having equitable access to healthcare, including insurance coverage. However, the specific role of government, methods of financing insurance and healthcare, and the meaning of equitable access have to be well defined. This would be so in a country where many are either not gainfully employed or are poorly remunerated. It is unclear whether such a fragile consensus can generate a secondary consensus about how to implement a system of equitable access. Should this workout well, glaucoma treatment would then be

piggy backed on the goodwill of a functional general public funding of healthcare services. This is doable and requires no rocket science ingenuity as similar healthcare issues appear in many nations.

4:4 Collective social protection and fair opportunity arguments

Basically two principal arguments including collective social protection and fair opportunity support a moral right to government-funded healthcare (Beauchamp and Childress 2013, p. 271). The collective social protection argument attempts to compare health needs to other needs that government has traditionally protected. It is argued that threats to health are relevantly similar to other threats such as crime, fire or pollution. It is a fact that collective actions and resources are deployed to resist such threats, and equally many collective schemes are used to protect health across the society especially public health and environmental protection. It is rational to expect, as a matter of coherence, collective action of critical healthcare assistance in response to threats to health.

The argument goes, by analogy of coherence, should Nigeria society has an obligation providing a service say security, consider essential, also has similar obligation towards another essential service such as healthcare. Similarly, should Nigeria society consider HIV essential for treatment equally, glaucoma should be essential for treatment as both afflict Nigerians and their treatments equally essential health needs. Nonetheless, the argument is not oblivious of antagonists tinkering with a notion that government responsibilities are neither obligatory nor

essential. However, argument from other comparable government services generates a public obligation to provide some level of goods and services to protect health.

Additionally, it is arguable that Nigerians have right to healthcare considering the fact that they have the right to expect a decent return on their investments into healthcare. Nigerians have invested so much into the healthcare professionals' education, biomedical research, and healthcare system as a whole. Nigerian public institutions including health institutions are established and sustained by public funds. It is expected that the society will reciprocate the contributions of Nigerians to healthcare. These contributions would range from cash (through taxation or proceeds from the sales of common patrimony of natural resources - crude oil etc) to kind (use of their skills) leading to a share of the burden of investment into healthcare system (Beauchamp and Childress 2013, p. 271).

It is not out of place for Nigerian IWG to expect from the individuals' and collective taxed investments, a protection for their health including glaucoma treatment. This should go beyond occasional government organized free or subsidized healthcare but one that is always available, accessible, affordable but preferably at no cost at delivery. This is a practical way to encourage treatment compliance among the IWG especially those that would become blind from glaucoma due to their inability to afford treatment.

Nevertheless, it appears a difficult task expecting a direct individual return on all collective investments. Of course some investments in healthcare are only for the purpose of discovering treatments, not for the provision of treatments once discovered. Also, not all investments eventually yield positive outcome and the liability should be shared. Even if Nigeria funds drug

research and regulates the drug industry, this activity does not justify the expectation that Nigeria would subsidize or reimburse individuals' drug purchases. However, it is not all citizens that invest into healthcare by way of their contribution that would eventually need or make healthcare demands. For instance, just a little fraction of Nigeria's population has glaucoma. The investment should be seen as a social pool where only the needy of healthcare - the IWG - draws from and not necessarily every citizen that make such investment. The argument on a moral right to healthcare secures only a right to a decent return on society's investment, not necessarily a full return.

In the same vein, the fair opportunity argument aligns with the collective social protection argument and its lesson is drawn from the fair-opportunity rule. It evaluates the justice of social institution based on its ability to mitigate lack of opportunity premised on unpredictable misfortune beyond an IWG's control. The IWG, like the victims of other regrettable misfortunes, have no control over it, have greater healthcare need that is, the glaucoma treatment need, and without it their lives would be worth less than when they are treated. It would be justice should Nigeria social institution of health funds glaucoma treatment. Daniels (2007, pp. 46-60) holds that as long as health conditions or disabilities create profound disadvantages and diminish the IWG' ability to function properly, justice requires that societal healthcare resources be expended to mitigate such effects and to enable the IWG a fair chance to express their inherent abilities.

On a different note, a comprehensive healthcare is desirable for all Nigerians. However, in reality it may not be feasible, due to finite resources especially considering the fact that health

is just one among many aspects of life that require attention. Of course, neglecting such other non-health sectors would not only be an injustice to them but also would necessarily affect the healthcare because health is a complex entity that depends largely on other sectors. For instance education, agriculture and even security would affect health if they are neglected. Nonetheless, justice demands that healthcare should be available and accessible to all. A more meaningful right of access to healthcare includes the right to obtain specified goods and services to which every entitled person has an equal claim. This essentially leads to basic healthcare services to all. The right to a decent minimum of healthcare therefore presents a more attractive goal- and, realistically, probably the only goal that can be achieved (Buchanan 1984, pp. 55-78; Buchanan 2009).

The basic healthcare services to all would be a practical egalitarian goal with universal accessibility to healthcare among Nigerians. A comprehensive glaucoma care for the IWG at no cost is a tall order and plausibly would necessarily mean shutting down Nigeria's economy and even borrow to supplement any short fall in the glaucoma treatment budget. The implication is as bad as a conclusion that Nigeria cannot afford glaucoma treatment. Nonetheless, glaucoma treatment is a need and its public funding is a worthwhile venture. Rather, Nigeria can afford to treat glaucoma with IWG still achieving the desire goal of life-long useful vision if basic treatment for glaucoma is adopted like for any other disease of public health importance.

4:5 Two tiered healthcare for glaucoma treatment

As a way to meeting egalitarian healthcare delivery with all citizens fairly treated, a standard conception of two tiered system of healthcare has been reported (Beauchamp and Childress 2013, p. 273). Tier-one would necessarily be free, universal and limited to essential treatment for glaucoma. Tier-two expectedly would take care of other glaucoma treatment demands. Specifically, it concerns itself with voluntary private coverage for other IWG's needs and desires. Tier-two would include better services especially in term of luxury and optional state of the art glaucoma care but at the IWG's expense either through private health insurance or direct payment.

The two-tier healthcare can be likened to a work place that provides a plate of cheap balanced diet at lunch time to each of its employees at no cost. Concurrently, any employee would be provided with a different balanced diet of her choice but at her own expense. The work place free plate of balanced diet is similar to tier-one healthcare because it contains basic nutrients for human growth and development. Like in tier-two, the employee's choice plate may in addition be served in an expensive plate and eaten in a reserved section of the work place's canteen. The difference in the two plates of food notwithstanding each employee would have eaten a balanced diet that is adequate to function optimally. Similarly, public funding tier-one healthcare allows the IWG access to basic glaucoma treatment necessary to preserve life-long useful vision.

Tier-one would meet basic health needs through universal access to basic health services.

Glaucoma treatment would be amply qualified as basic health need as it eventually makes life

worth less if untreated. The beauty of tier-one is that it takes care of all basic healthcare needs, a universal care. Moreover, the model provides healthcare to all citizens and enables the public to meet its obligations rather than avoid a social responsibility.

The two tiered healthcare provision boasts of a decent minimum care and offers a possible compromise among various theories of justice. This is so as it incorporates some moral premises that most theories emphasise. It promises basic healthcare for all through equal access while concurrently allowing unequal additional purchases by choice, thereby mixing private and public forms of distribution. It should appeal to an egalitarian as it has dual merits: an opportunity to use an equal access principle and incorporates fair opportunity in the distribution system. Equally, it should be a utilitarian delight as it would minimize public dissatisfaction, maximize social utility, and permit allocation decisions based on cost-effectiveness analysis.

Similarly, the proponents of a capabilities theory or a well-being theory can see the likelihood of increases in the capability of many to afford better quality care and achieve better states of health. Notably, a healthcare system that finds pockets of support from each of these accounts could also turn out to be the fairest approach to democratic reform of the system (Ubel 1996, pp. 1174-77; Menzel 2002, pp. 24-37).

The decent minimum treatment holds multiple beneficial effects to the IWG and Nigeria. In the first instance, it would save the IWG plausible worries that are associated with deteriorating vision with which they cannot help themselves. It would ensure the IWG are able to lead worthwhile life. This would translate to gains for Nigeria as the IWG would be productive and

be responsible to society rather than becoming dependants. The economic loss to society would be huge should glaucoma blind be rehabilitated at the society's expense. Though, rehabilitating glaucoma blinds would not restore lost vision but can make life more meaningful than without it.

Rehabilitating glaucoma blinds (persons who are blind due to glaucoma) can be very expensive and though, not directly saving life but somehow is comparable to rescue principle which asserts that it is intolerable for a society to allow people to die who could have been saved by spending more money on healthcare. Just as it would have saved unnecessary challenges, preventing poliomyelitis in children, by providing immunization rather than spending huge amount on rehabilitation that would not restore lost function later in life so also, is treatment of glaucoma before it becomes advanced.

Rather than Nigeria embarking on rescue principle through belated rehabilitation of glaucoma blinds, if such is even ever contemplated, expending huge resource on glaucoma that its harmful effect is controllable, it would be 'prudent insurance' to embark on glaucoma treatment to control its blinding effect. This would eliminate undue use of rescue principle which Dworkin (2000) has rightly criticized. He argues that rescue principle grows out of an 'insulation model' that gives a special treatment to healthcare compared to all other goods. It is unlike ideal market which entails a fair distribution of wealth and income as envisioned by Dworkin. Though, may be difficult to implement Dworkin's is a good model for determination of what justice requires in the way of a decent minimum.

4:6 Procedural strategies for setting priorities

Meanwhile, there are some target goals that are consistent with justice and national health policies that would assist glaucoma treatment among Nigerians. Firstly, there should be unrestricted access to a decent minimum of healthcare through some form of universal insurance coverage that ensures the right to healthcare. This would enhance glaucoma treatment compliance in the IWG especially the indigents who constitute the majority of Nigeria population.

Secondly, there should be acceptable incentives for health professionals and consumer - IWG. Effort should be made to contain and maintain cost so as to keep expenditures within control. This is necessary as any unplanned rationing at the tier-one would compromise the goal of providing a decent minimum. Thirdly, there should be a carefully planned fair system of rationing that does not violate the decent minimum standard. Lastly, the system should be amenable to periodic upward review which is devoid of radical interference with basic institutions that finance and deliver healthcare (Beauchamp and Childress 2013, p. 284).

4:7 Rationing in glaucoma treatment

Glaucoma is a complex eye disease so also its treatment. The truth is that the cost of managing an IWG can never be fixed and can be as much as new advances in glaucoma treatment can accommodate. Nonetheless, there is a basic minimum of treatment, which, should be viewed as necessary, that the society can and should accommodate without compromising the IWG's

visual function based on existing standard practice in Nigeria. The key issue in glaucoma is a treatment that is effective, sustainable and life-long. This will require some rationing at tier-one to accommodate finite resource and without compromising visual function. Here rationing would essentially satisfy a utilitarian strategy that emphasizes maximal benefit to the IWG and society, and an egalitarian strategy that emphasizes the equal worth of persons and fair opportunity. A good start would be a tier-one that can accommodate bimonthly two-anti-glaucoma drugs for each IWG. The drugs can be separated or combined. A combined two-drug regime would ensure compliance, less harmful to QOL (Kazaki 2015, p. 37) and reduce cost. It is not impossible to negotiate the price of anti-glaucoma drugs with pharmaceutical companies or set up Nigeria-owned-drug plants in order to reduce the cost of anti-glaucoma drugs. Moreover, few selected IWG who demand special care though not necessarily superior to basic treatment in term of the overall visual function outcome would receive tier-two care but at their own expense.

Rationing in managing glaucoma would essentially be in terms of health personnel, investigation, drugs, IWG and health facility. The IWG should be sorted out for treatment (triage). A comprehensive investigation is desirable in cases of suspicious glaucoma to arrive at correct diagnosis. Except whenever indicated, high-tech investigations should be sparingly used or be used on demand at tier-two. Those already blind by glaucoma should not be considered for drug treatment except there is associated pain. Personnel should be rationed with skilled personnel attending to all the IWG and highly skilled attending to difficult and tier-two cases.

4:8 Universal Healthcare Insurance

The current majorly open market healthcare where Nigerians purchase healthcare out of pocket or use NHIS would not enhance life-long useful vision among mostly indigent IWG because many would not afford payment or access NHIS. Health charges have been deterring poor Nigerians from accessing glaucoma care and plausibly worsen their visual outcome. Moreover, free market necessarily exposes the IWG to choices that would not maximize health benefit as they would attempt to get cheaper but inadequate treatment.

On another note, glaucoma causes irreversible blindness and would necessarily either be unattractive to private insurance or attracts prohibitive premium putting glaucoma in a class of such diseases that always have to be a state-funded safety net to cover the treatment of risks which private insurance companies choose to exclude from their policies (Jackson 2013, p. 36). Furthermore, Nigeria provided general health insurance for its citizens would insulate the IWG from the real costs of care, and would encourage glaucoma treatment compliance than they would in a straightforward open market model. Besides, it would plausibly optimize use of healthcare resources and improve experience of healthcare professionals. Finally, there would be gain in administrative cost saved by state-run systems compared with multiple private insurers. A Nigeria driven general health insurance coverage would also ensure justice in meeting glaucoma healthcare needs, its sustainability, and would promote (quality) and maximize (quantity) well-being among Nigerians. Glaucoma treatment is worth funding by Nigeria.

4:9 Conclusion

Justice in healthcare resource allocation would aid Nigeria's funding glaucoma treatment.

Allocating resources for glaucoma treatment can be at macro-, meso- and micro-levels.

Glaucoma treatment is a healthcare need because untreated glaucoma impairs vision, disrupting a flourishing life. Many IWG are indigents, require public funded treatment to reduce blindness burden in Nigeria. Justice-based approaches such as Hippocrates, Marx, Rawls, Aristotle, utilitarian, egalitarian, communitarian, capability, well-being and fair opportunity rule demand healthcare that would ensure glaucoma treatment for Nigerians at no cost at point of delivery. This is necessary to preserve vision and a flourishing life in the IWG.

The two tiered healthcare system holds promise in realizing glaucoma treatment in Nigeria at no cost at point of delivery. Whereas a tier-one would necessarily provide basic universal glaucoma treatment ensuring life-long useful vision, tier-two meets demands of any IWG especially sophisticated care at the IWG's expense but not necessarily better in eventual visual outcome than what obtains in tier-one. The two tiered model would enhance justice in meeting glaucoma treatment need with egalitarianism and utilitarianism at their best.

Tier-one provides cost free basic universal healthcare for diseases of public health importance including glaucoma and sustained by general health insurance coverage for all Nigerians. An ethical-based treatment rationing would save cost without compromising the best possible visual preservation among the IWG.

Chapter Five

Conclusion

Glaucoma is a relentless degenerative eye condition of complex origin. It accounts for irreversible blindness and impaired vision in hundreds of thousands Nigerians interrupting their capacity to flourish thereby responsible for huge economic loss to Nigeria. Glaucoma can be slowed down to enhance life-long useful vision if and only if glaucoma is diagnosed in its early stage and effective treatment is sustained. Many IWG would not seek or comply with treatment because they would not afford it. Nigeria's current open market treatment therefore, is inadequate to markedly reduce burden of glaucoma blindness in Nigeria. The indigent IWG would be relieved with public funding glaucoma treatment.

Despite Nigeria's funding glaucoma treatment being long overdue, the opponent to it would contend with flimsy excuses including majorly marginal visual improvement following treatment and poor state of Nigeria's economy to oppose it. However, glaucoma funding is worthwhile and feasible. The opponent excuses rather remain challenges that are even reasons why glaucoma should be public funded. The peculiarities of glaucoma should rather attract public sympathy and deserved funding for glaucoma. Moreover, with appropriate management of its resource, Nigeria should comfortably afford funding its social services including glaucoma treatment.

Importantly, treatment is a need to an IWG and justice demands fair treatment for her. It is unfair to excuse Nigeria's funding glaucoma on poor economy because doing so would only lead to more Nigerians going blind, a situation that would further worsen Nigeria's economy. Rather, Nigeria should mobilise and allocate resources towards glaucoma care.

Nigeria's allocation of resources towards funding glaucoma can be macro, meso and micro-allocations. Glaucoma treatment is a healthcare need because untreated glaucoma causes visual impairment interrupting flourishing life. Public funding glaucoma meets Nigeria's social responsibility, reduce burden of blindness and mitigate its adverse health, social, educational and economic implications on the IWG and society. Justice approaches such as Hippocrates, Rawls, utilitarianism, egalitarianism, communitarianism, capability theory, well-being theory and fair opportunity rule advocate healthcare system that would ensure Nigerians' access to glaucoma treatment preferably at no cost at point of delivery. This plausibly would enable the IWG to lead a flourishing life achieving their life goals which glaucoma blindness would have prevented.

A two tiered healthcare model holds promise to realizing glaucoma treatment in Nigeria at no cost at point of delivery. Whereas tier-one provides basic universal glaucoma treatment, ensuring life-long useful vision, tier-two meets demands of any IWG especially sophisticated care at the IWG's expense but not necessarily better in eventual visual outcome than what obtains in tier-one. The two tiered model enables justice in meeting glaucoma treatment need with appeal to egalitarianism and utilitarianism. Notably, tier-one provides universal basic healthcare for diseases of public health importance including glaucoma and sustained by

general health insurance coverage for all Nigerians. This would largely make campaign for public funding glaucoma treatment not only easier but also impartial because some other diseases of public health importance have comparative treatment cost benefit over glaucoma. Notwithstanding its name, a disease interrupts flourishing life making its treatment a need. Ethical-based treatment rationing would save cost without compromising the best possible visual preservation among the treated IWG.

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