Observations on Eye Care in Lamu, Kenya

Overlooked Needs and Proposed Interventions

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Introduction

These notes draw attention to the underserved eye care needs of residents of Lamu, Kenya. They are comprised of observations that we, Rebecca Gearhart, an anthropology professor at Illinois Wesleyan University (IWU) and Erick Henderson, an IWU biology and pre-optometry major and president of the Optometry Club, made while volunteering at a clinic in Lamu, Kenya during the summer of 2011. Plans to establish a temporary eye clinic emerged after Rebecca discovered that Erick was an optometric technician who might use his portable optometry lens set to fit residents of Lamu Town on Lamu Island for glasses and teach them about eye health. We spent ten days volunteering at the Lamu Center of Preventative Health (LCPH) assisting the Center's director, Munib Abdulrehman, in performing reading evaluations and glaucoma checks for 340 patients and distributing 450 pairs of reading and sunglasses.

Lamu is an island that encompasses 63.6 square miles and is situated in an archipelago that lies just off the northern coast of Kenya, 150 miles north of the coastal city of Mombasa. With a population of 18,382, Lamu Town is the largest population cluster in Lamu County, which occupies 3,831.8 square miles and is home to 101,539 residents.[1] The 2011 Human Development Report ranks Kenya 143 out of 200 countries with comparable data on multidimensional poverty.[2] In coastal Kenya, 69.7% of people live in poverty, about twice as many as those in the capital city of Nairobi.[3]

There are six health facilities in Lamu Town, none of which provide eye care services. The Lamu District Hospital provides emergency care including surgical procedures, diagnostic care and inpatient care. Among the five smaller clinics, one specializes in maternal health, another is focused on pediatrics, and the other walk-in clinics provide basic care for common illnesses, such as malaria and respiratory infection. Also located in Lamu Town is the Lamu Center of Preventative Health (LCPH), which was established in 2009 by Munib Abdulrehman, a Lamu native and American-trained nurse practitioner and doctoral student. LCPH provides free screenings for, and education regarding, chronic illnesses, such as diabetes and hypertension. The Center also focuses on filling other gaps in preventative healthcare in the community, such as providing free malaria and HIV/AIDS testing and counseling. Other preventable eye conditions such as cataract and glaucoma can be detected early, yet the healthcare personnel required to perform the testing are often unavailable in rural Kenya. Providing free screenings and distributing appropriate eyewear to prevent blindness among Lamu residents fits squarely within the LCPH mission statement, making LCPH a natural site for the temporary eye clinic. [4]

In the sections that follow, we provide a context for understanding the eye care challenges faced by coastal Kenyans like those who visited the temporary eye clinic at LCPH. We discuss the facilities and interventions that are currently available to such patients and present case studies based on the patients we met, whose stories highlight these issues on a personal level.



Olusegun Yayi

State of Eye Care in Kenya

In sub-Saharan Africa, the ophthalmologist-to-person ratio is 1:1,000,000, representing a significant challenge to eye health that is particularly formidable in remote areas like rural Kenya.[5] To address the healthcare disparities in Kenya, the World Health Organization (WHO) and the International Agency for the Prevention of Blindness (IAPB) have implemented an eye care initiative known as "VISION 2020: Right to Sight." This worldwide program began as an effort to support organizations working to end avoidable blindness throughout the world. The program targets the prevention and treatment of cataract, glaucoma and diabetic retinopathy to curb blindness and is poised to have a significant impact on

the population of Kenya if properly implemented. Currently, in Kenya, the VISION 2020 program relies heavily on the training of ophthalmologists at the University of Nairobi's Department of Ophthalmology.

Since approximately 80% of the conditions that lead to blindness are preventable, an increase in the number of eye care specialists as well as improved technologies that make eye-care procedures cheaper and easier will undoubtedly benefit Kenyans.[6] For example, prior to the 1990s, cataract repair in Kenya typically required the surgical removal of the natural lens and the production of an extremely thick pair of aphakic glasses to compensate for the lack of focusing power previously provided by the eye's natural lens. With Intraocular Lens (IOL) implant technology, an artificial lens is inserted directly behind the iris in place of the damaged lens and only the surgery is necessary, eliminating the need for the costly production of aphakic glasses.[6] In spite of this improved technology, however, the lack of eye care specialists trained to perform IOL surgery prevents its use among the general Kenyan population. In 2000, Karimurio identified cataract as one of Kenya's leading eye health issues and suggested that the need for eye care specialists in Kenya was evident in the high prevalence of cataract among the population. Based on the number of patients suffering from cataract who visited the temporary eye clinic in Lamu, we believe that cataract remains an undertreated eye condition.

Current statistics point to the prevalence of eye care problems among Kenyans in general as well as among coastal Kenyans, particularly in remote areas of the country. In 2010, the Kenya Society for the Blind provided eye care services to over 25,000 Kenyans through stationary and mobile clinics in remote rural areas of the country.[7] Another organization that is engaged in similar work is The Lighthouse for Christ Eye Centre, which is based in Mombasa and provides eye care for 25,000 patients annually. The Lighthouse focuses its services on prescribing eyeglasses and performing cataract and glaucoma surgeries, even to those in remote areas of the Coast Province. In 2012, 2,786 patients were seen at temporary eye camps sponsored by The Lighthouse to reach underserved populations in rural areas of the Mombasa hinterland.[8] The Kwale District Eye Centre, located south of Mombasa along the coast, is the only other clinic specializing in eye care in coastal Kenya. Between January and June of 2012, the Centre provided optical services to 12,053 patients at the base hospital and at community screenings, and performed 822 cataract and 48 glaucoma surgeries. [9]

Based on self-reported patient censuses from these eye care facilities, as well as the 340 Lamu resident visits at LCPH during the ten-day eye care clinic we assisted, it was evident that there is great demand for eye care in coastal Kenya. This is especially true for populations in Lamu County, where there is a lack of regular eye care services or professional eye care specialists. This assertion is not to suggest that residents of Lamu County have greater incidence of eye problems compared to other Kenyans, but that due to their remote location, the eye problems of Lamu County residents go untreated due to the limited availability of optical services. The lack of eye care makes long-term eye care, including post-operative treatment, unlikely for these residents. This could have possibly contributed to the preventable complications, such as corneal scarring, and pathologies that we saw.



Olusegun Yayi

Presbyopia

In addition to cataract and glaucoma, research conducted by Patel and West specifically argues that functional presbyopia (near vision impairment) is a primary health challenge in East Africa that the WHO needs to address more adequately.[10] Presbyopia is a condition in which the eye is no longer able to focus on near objects. Although this condition affects approximately 85.4% of the rural Kenya population, only 5.4% use corrective lenses.[11] This is compared to 39% of Brazilians and 84% of Australians with presbyopia who use corrective lenses.[12,13] Presbyopic correction is often taken for granted in the developed world because improving one's vision is as easy as purchasing a pair of reading glasses from a local convenience store. In rural Kenya, however, such glasses are largely unavailable. Even if they were available, however, there are very few optometrists who can prescribe the proper corrective lenses to those who need them.

While presbyopia in the developed world is commonly associated with an inability to focus on printed text, illiteracy among coastal Kenyans is high (62.9 %) and thus other consequences are more pressing.[2] Most coastal Kenyans who suffer from presbyopia require near-vision correction not for reading, but rather to complete tasks such as threading a needle, wood carving and mending fishing nets. The majority of female patients we saw specifically complained of an inability to read the numbers on their cell phones. Patel and West's finding demonstrates that women in low- and middle-income countries have a higher prevalence of presbyopia; this supports our observation that female patients sought treatment for near vision impairment in greater numbers than did male patients.[10] A common complaint from older women was that they were having difficulty sewing *kofias*, the intricately hand-sewn caps worn by Swahili men. These caps are extremely detailed and often take months to complete. The high price they fetch sustains the women and allows them to be financially self-sufficient.

Though the need for reading glasses in developed countries is commonly associated with increasing age, the prevalence of presbyopia among young people in Africa is higher than it is among those of the same age bracket in Europe and North America.[10] Patel and West also point to studies that correlate early onset of presbyopia with latitude and hotter climate, which may help explain the number of young people at the Lamu clinic who suffered from near vision problems.

In order to highlight some of the eye care issues faced by residents of Lamu Town, we offer case studies of three of the patients we saw during the ten-day period during which the eye clinic was open at LCPH. The names of these patients and any identifying characteristics them have been changed to protect their anonymity.

Case Studies

Faraj

As seventy-year-old Faraj carefully felt his way into the eye screening room by following the wall with his hand, it was apparent that he was suffering from severe vision problems. After performing a visual field evaluation by hand, it was determined that Faraj had lost the majority of his peripheral vision. Faraj's intraocular pressure (IOP) was checked first; then his optic nerve was observed with an ophthalmoscope. The normal IOP of a healthy eye is 10-20. The pressure in both of Faraj's eyes was over 50, indicating that he was suffering from glaucoma. Since



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Faraj's vision had deteriorated so much and so little of his sight remained, no remedy could be suggested. Though Faraj was disappointed that no treatment was available to correct his vision, he left the clinic with a deeper understanding of his condition, which had never before been explained to him.

Amina

22-year-old Amina explained right away that she had never been able to see very well and that, as a result, her schoolwork had suffered throughout her childhood. Performing a preliminary vision screening helped determine that she was suffering from myopia, a condition more commonly known as nearsightedness. (Amina tried on pair after pair of lenses of increasing strength to try and make out the letters on the vision chart on the wall across the room.) Eventually, when the lenses reached a power of -5.00 diopters, she was able to accurately see the symbols on the chart. A pair of donated spectacles that matched this power was a perfect fit for Amina's needs. As she placed the glasses on her nose, Amina closed her eyes. When she opened them and looked around, she let out a sigh of relief and gleefully declared that she could see everything clearly for the first time in many years.

Omar

When we asked Omar what had brought him to LCPH the day he visited, he explained that his eyes often irritated him and complained of the buildup of a white film on one of his eyes. Upon inspection, Omar's condition was diagnosed as a pinguecula, a tissue deposit that often develops on the conjunctival layer of the eye as a result of excess ultraviolet (UV) light exposure. Once a pinguecula has formed, it cannot be reduced in size. As a young man in his early twenties, Omar was alarmed at the diagnosis. When it was explained that the condition was caused by exposure to sunlight and other environmental irritants, Omar told us that he had fished for a living since childhood. Though he had owned a few pairs of sunglasses throughout his life, he often lost them while fishing and thus stopped wearing them a few years ago. Omar was given two pairs of sunglasses, one to keep as a spare in case he lost the other. Wearing the sunglasses would help protect Omar's eyes from future environmental damage and slow further growth of the pinguecula, preventing the future need for surgery.

Analysis

It is significant to point out that the reading chart, the lens kit and the glaucoma testing equipment (a tonometer pen) that Erick brought with him to Lamu are rare in most clinics in Kenya. Since the test that measures intraocular pressure, often referred to as the "puff of air" test, has been routinely offered to patients in the U.S. since the early 1970s, it is startling to discover that the test is largely unavailable in Kenya. The absence of such basic examination tools is due to both cost (a tonopen costs approximately $3,000) and a lack of trained eye care specialists.[15] If patients such as Faraj, Amina and Omar had received routine eye examinations throughout their lives, many of the impairments from which they now suffer could have been avoided. Faraj told us that his visit with us was the very first time he had ever had an eye exam, even though his vision began to fail him many years ago. If an eye care professional had detected the warning signs of glaucoma earlier, the damage to Faraj's optic nerve could have been reduced, if not prevented altogether.

Pingueculas and pterygiums were apparent in over a quarter of the men we saw at LCPH. Both of these conditions are characterized by growths that form on the conjunctiva, the thin tissue covering the white of the eye.[16] These conditions are directly related to exposure to ultraviolet radiation, dust and wind—all extremely prevalent in Lamu.[17] While they typically only generate cosmetic symptoms, such as discoloration and buildup, these conditions can cause irritation and vision problems if the growth continues to develop towards the cornea. The prevention of these growths is easy and relatively inexpensive, namely, wearing sunglasses with UV protection. This is especially critical in Lamu, just two degrees below the equator, where the sun shines twelve hours per day, from 7:00 a.m. to 7:00 p.m.

These case studies offer a glimpse into the lives of Kenyans who suffer from untreated, but easily preventable visual impairments. In Kenya, where the average life expectancy of 58 makes seventy-year-old Faraj much older than most, fellow Kenyans may understand his blindness as a natural consequence of aging rather than the preventable disability that it is.[18] In a country where the unemployment rate is 40%, the fact that young people such as Amina and Omar are unemployable because they have visual impairments may not seem as alarming in Kenya as it might in another context. We wonder if dismal statistics such as these prevent Kenyans from realizing the impact visual impairment has on quality of life and deter them from demanding improvement in eye care.

Perhaps the most disturbing situation we encountered in Lamu was that the majority of those who had undergone cataract surgery complained of dramatically reduced vision and, in some cases, complete blindness. The lack of post-operative eye care available to patients in Lamu County has far-ranging implications, but without documented patient histories or medical records, it is challenging to determine the exact cause of the vision loss. The tales of botched surgeries that we heard reflect negatively on healthcare providers and clinics, especially in small communities, and are a substantial barrier to effective health care delivery.[19] Briesen et al. suggest that claims of botched eye surgeries in Kenya are nothing but rumors communicated among misinformed people who do not understand that the eye surgery is safe. However, because community members often hear stories of how people in rural areas are used as fodder for medical students, such rumors can be detrimental to legitimate healthcare interventions.[19] Since there are no reports available that provide statistics on the success or failure of eye surgeries in Kenya, it is difficult to determine the actual prevalence of botched eye surgeries.

Looking Ahead

Our experiences working with patients in Lamu, Kenya over a ten-day period in the summer of 2011 revealed significant eye

problems among people in poverty-stricken communities with inadequate healthcare. Concomitant factors that contribute to eye diseases among Lamu residents include living close to the equator, where damaging UV rays are a danger, and constant exposure to environmental irritations, such as sand and smoke from stoves and burning trash. While outdoor work, such as fishing, exposes men to the damaging rays of the sun, women are exposed to smoke from charcoal stoves, putting members of both sexes at risk for eye problems. Directing local public health education programs to focus on eye health and the training of public health officers, nurses, clinical officers and primary care physicians on how best to prevent and treat common eye problems and provide post-operative eye care would greatly improve patient care in Lamu. Since eye health is an understudied area of research in Kenya generally, more medical research needs to be conducted to further evaluate the scope of the conditions we observed among Lamu residents.[20] If significant improvements in eye care for Kenyans are to be made, the needs of underserved populations, like those in Lamu, need to be reevaluated and taken seriously.

Improving eye care and enhancing the general health of the people of Lamu will require time, effort, creativity and resources. Although the VISION 2020 program has been providing support services for the prevention of blindness throughout Kenya, it also needs to direct resources to fight presbyopia, a contributing factor to functional blindness.[5] The scope of the problems caused by presbyopia warrants attention and the condition is relatively inexpensive to address. Thus, eradicating presbyopia in Kenya should be an immediate goal, and the prevention of cataracts and glaucoma should be a longer-term goal of any vision-focused intervention in the country.

Spectacles to correct presbyopia cost approximately U.S. $1.00 (75 KSh) per pair, a sum that the average American can easily muster, but is quite formidable for the average person in Lamu.[11] The average monthly income for a resident of coastal Kenya is 3,117 Ksh ($41.56).[2] Since the cost of food-per-capita, per month, costs nearly half of the average monthly wage, just over $20 is typically left over to cover all other expenses.[2] In this light, the purchase of a pair of reading glasses, though inexpensive in some parts of the world, is not feasible for those in Lamu. The high cost of vision testing equipment is also an obstacle in Kenya, though new technology developed by researchers at MIT provides hope for the future. The Near-eye Tool for Refractive Assessment (NETRA) is a portable lens that attaches to the face of a cell phone and costs just one to two US dollars to make.[21] Such innovative and appropriate medical technology presents itself as a silver lining in an otherwise discouraging situation.

We challenge Kenya's VISION 2020 program to aim for the eradication of functional blindness in Kenya by making properly prescribed reading and sunglasses available to all citizens who need them. If we were able to distribute four hundred and fifty pair of glasses in ten days, we believe that the Kenyan government could implement a campaign throughout the country to do the same, starting with those with least access to such services. With momentum gained through the eradication of easily treatable vision loss, more difficult eye care problems, such as cataracts and glaucoma, can be addressed. With improved public health education, early detection and prevention and better access to eye care professionals, the future will be brighter for Kenyans like Faraj, Amina and Omar.

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