

## AN ABSTRACT OF THE THESIS OF

Lianna M. Lowe for the degree of Honors Baccalaureate of Science in General Science presented on March 5, 2013. Title: Mothers and Caretakers' Perception of Childhood Eye Care In Rural Ashanti, Ghana

Abstract approved:

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Dr. Ray Tricker

According to the World Health Organization, there are an estimated 1.4 million blind children in the world, of whom approximately 300,000 live in Africa. About one-half of these cases of childhood blindness could have been prevented. Each year, an estimated half a million children become blind (nearly one per minute), of whom up to 60% die in childhood. In addition, the country of Ghana has one of the highest prevalence of glaucoma in the world, with 8.5% of Ghanaians being affected by this disease. This country has only basic healthcare services, along with an extensive history of traditional medicine and village healers. The **objective** of this study was to explore the caretakers' point of view of childhood eye care, in terms of knowledge, reaction and trust in modern medicine, in the Ashanti region of Ghana. The **method** of investigation was a cross-sectional examination of a rural sample by conducting 152 interviews, consisting of male and female caretakers of various ages. Each interview consisted of a 10-question survey and 10-question poverty scorecard. **Findings** indicate a greater trust or belief in modern medical practices than previously believed in this region. Also found was a low level of previous exam history, high prevalence of eye problems and a need for increased parental education in relation to childhood eye care.

Key Words: childhood eye care, modern medicine, knowledge, Ghana,  
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Mothers and Caretakers' Perception of Childhood Eye Care

In the Ashanti Region of Ghana

by

Lianna M. Lowe

A PROJECT

submitted to

Oregon State University

University Honors College

in partial fulfillment of  
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degree of

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Honors Baccalaureate of Science in General Science project of Lianna M. Lowe presented on March 5, 2013.

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Dean, University Honors College

I understand that my project will become part of the permanent collection of Oregon State University, University Honors College. My signature below authorizes release of my project to any reader upon request.

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Lianna M. Lowe, Author

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## **Mothers and Caretakers' Perception of Childhood Eye Care In the Ashanti Region of Ghana**

### **INTRODUCTION & SPECIFIC AIM**

Like many developing countries, Ghana is searching for an effective, efficient and appropriate way to meet the health care needs of its evolving and growing population. One aspect of healthcare that continues to lag behind the rest of the world is eye care. According to the World Health Organization, Ghana has one of the highest prevalence of glaucoma in the world with 8.5% of Ghanaians affected by the disease. In addition, there are less than 300 eye care professionals in the country to meet the needs of over 24 million people.

Ghana is located on the coast of West Africa between Cote d'Ivoire and Togo. The country has one of the largest gross domestic product growth rates at 14.4%, making it one of the fastest growing economies in the world (World Bank, 2011). Healthcare is provided to citizens by the government in Ghana but in 2005 the government only spent 6.8% of its GDP on healthcare or about \$30 per person (WHO, 2006). This level of care leaves many gaps in healthcare services, many of which non-government organizations (NGOs) and religious groups are trying to fill. This project was developed in partnership with an NGO, Unite For Sight, which is a non-profit organization that strives to bring eye care to people in India, Ghana and Honduras.

The objective of this study was to explore caretakers' point of view of childhood eye care in the Ashanti region of Ghana. Data was collected by interviewing 152 female and male caretakers, who had children between the ages of 0-17 living in their household. Each interview consisted of answering a ten-question survey and poverty scorecard. This study focuses upon caretakers' perceptions of modern medicine in terms of children's eye care. Numerous studies have explored the scope and impact of traditional medicine in Ghana but few have studied the rural population's comprehension and assessment of modern medicine. None have investigated

this in the context of eye care. This study will add to current literature with the specific aims of exploring the following research questions. The principle investigator, in relation to the subject of this study, investigated the following research questions:

*Research Questions*

1. What percentages of children have had eye exams in this region?
  - a. If the child has not had an eye exam, why?
2. What is the prevalence of eye problems for children within this region?
  - a. What were the most common complaints?
3. To what extent do caregivers know about the causes of eye problems in this region?
4. How do caregivers react to and treat eye injuries in children?
5. In this region, do caretakers believe children in their household would benefit from having an eye exam by a professionally trained eye doctor?
  - a. Why or why not?

## **BACKGROUND & LITERATURE REVIEW**

### *Importance of Childhood Eye Care*

If not treated, childhood ocular conditions can lead to permanent visual loss. According to the World Health Organization, there are an estimated 1.4 million blind children in the world, of whom approximately 1 million live in Asia and 300,000 in Africa. Each year, an estimated half a million children become blind (nearly one per minute), of whom up to 60% die in childhood (3.5.3 Childhood Blindness, 2004). About one-half of the estimated 1.4 million cases of blindness in children could have been avoided (Vision2020, 2007). While the prevalence rate of childhood blindness may not be as high as adult blindness, the number of years one lives with the condition makes childhood blindness a major concern.

The major causes of blindness in children varies from region to region and is largely dependent on socioeconomic development, especially the availability of primary health care and eye services. In high-income countries, lesions of the optic nerve and higher visual pathways are the predominant causes of childhood blindness (Gilbert, 2001). While in lower-income countries, corneal scarring, vitamin A deficiency, neonatal conjunctivitis (ophthalmia neonatorum) and the use of harmful traditional eye remedies are the major causes (Gilbert, 2001). Many of the conditions associated with blindness in children are also causes of child mortality (e.g. premature birth, measles, congenital rubella syndrome, vitamin A deficiency, and meningitis) (Gilbert, 2001). Blindness in children is, therefore, closely linked to childhood survival. This highlights the importance of appropriate and timely intervention in conditions causing childhood visual impairment, particularly those that are treatable. The reality is that in much of the developing world, poor public health resources result in many childhood ocular conditions being left untreated.

The bacteria *Chlamydia trachomatis* in the eye results in the infection disease, Trachoma, which is one of the worlds leading causes of preventable blindness (Vision2020, 2007). This infection is endemic in 55 countries (including Ghana) and is estimated to affect over 80 million people worldwide (Vision2020, 2007). Trachoma is a condition of poverty and affects communities with poor water supplies, sanitation and health services. Infection often begins during infancy or childhood and can become chronic. It can be easily treated with antibiotics but if left untreated, infection eventually causes the upper eyelid to turn inwards (trichiasis), resulting in intense pain and corneal scarring (Trachoma, 2001). This scarring and blindness can be prevented by surgery to correct the inward turning of the upper eyelid (Trachoma, 2001).

### *Poverty & Eye Care*

Merriam-Webster defines poverty as, “the state of one who lacks a usual or socially acceptable amount of money or material possessions.” Poverty is determined in most countries by a poverty threshold or line, the minimum amount of income deemed supportable in that given country. This amount varies greatly from country to country and is significantly higher in developed countries compared to developing countries. The international poverty line is set by the World Bank and is currently \$1.25 a day (last revised in 2008). 9 out of 10 of the world’s blind population lives in developing countries, representing a social, public health and economic problem (Informal, 1998). Eye diseases that cause preventable blindness are often the result of a mixture of factors including poverty, lack of education, deficient health-care services and lack of opportunity for people to control their health care.

A study comparing the socioeconomic status of countries and blindness prevention data, found an inverse relationship between economic development and the prevalence of blindness (Ho and Schwab, 2001). Poverty is visible in countries with the greatest burden of avoidable blindness, compounded by the disproportion of the quantity and quality of eye care services

available in these countries. A study from India reported on the possible link between per capita income and blindness (visual acuity of less than 6/60 or central visual field of less than 20 degrees in the better eye), found the possibility of blindness increased with decreasing monthly per capita income (Dandona, 2001). Those in the lower (monthly per capita income of \$11.30 or less) and extreme lower (monthly per capita income of \$4.50 or less) and socioeconomic strata had a five and ten times higher risk of being blind, compared with those in the upper socioeconomic strata (monthly per capita income greater than \$45.50) (Dandona, 2001). Clearly stated, current research and literature shows that poverty and ocular complications have a correlation.

### *Eye Care in Africa*

The state of eye care in Africa is an alarming contrast to the rest of the world. High practitioner-to-patient ratio, inadequate facilities, meager government funding and lack of educational programs are the norms of eye care in Africa. In a low-income country, basic healthcare cost are estimated to cost between \$30 to \$40 per person, per year, but across much of Africa healthcare spending is less than \$6 per person, per year (Naidoo, 2007). With only approximately 10 percent of the world's population, Africa contains 19 percent of the world's blind population (Naidoo, 2007). The continent accounts for almost seven million people with visual limitation with the leading causes being preventable and treatable ocular conditions (Thylefors, 1995). The eye care crisis is only exacerbated by the high prevalence of HIV-AIDs in Sub-Saharan Africa, which places disproportionate pressure on the health-care system by monopolizing a high percentage of limited resources (Naidoo, 2007).

The number of optometrists being produced in Africa is also inadequate to effectively meet eye care needs. Only seven of the 53 African countries conduct optometric training programs (Naidoo, 2007). To make matters worse, the majority of practicing optometrists and

ophthalmologist live in urban areas and serve only a fraction of the population (Naidoo, 2007). In South Africa, only 20 percent of the population is served by the private sector. Approximately 2,500 optometrists provide eye care to a population of 44 million people, which is roughly one optometrist for every 17,600 people (Naidoo, 2007). In comparison to the United Kingdom, which has a ratio of approximately one optometrist for every 5,200 people (Ingram, 2001). In many instances, eye care services in Africa are put on the shoulders of ophthalmic nurses, general physicians and traditional healers. In Ghana specifically, there are 41 ophthalmologists (26 of which are in the capital city of Accra), 42 optometrists and 250 ophthalmic nurses to serve the eye care needs of over 24 million people (Merabet, 2008).

#### *Ghana: The Country*

The Republic of Ghana is a country located in West Africa, slightly smaller than Oregon in size and has approximately 24 million people (CIA fact book, 2012). The country is comprised of 10 administrative regions or states, the Ashanti region being one of them. Once a British colony, Ghana received its independence in 1957 and became the first country in colonial Africa to do so (CIA fact book, 2012). According to the World Bank, the country is considered a lower-middle income economy, with a GDP per capita of \$1,688.62. In terms of poverty, 28.5% of the population lives below the international poverty line (\$1.25 a day) (World Bank, 2006). Like many other former British colonies, the official language is English, but there are 11 government-sponsored languages and over 80 individual languages spoken throughout the country (Lewis, 2009). The country is a juxtaposition of old and new, over 70% of the population has a cell phone yet the capital and largest city, Accra has no central sewer system and over 50% of its residences do not have a toilet in their home (Ohene, 2012).

Family structure is also a very important component of Ghanaian culture and way of life in the region. Households in Ghana tend to be almost twice as large in comparison to the United

States of America, 5.1 in Ghana and 2.69 in America (Introduction, 2010; US Census Bureau, 2010). In the more rural regions of Ghana, it is not uncommon for more than 10 people to be living in one household. This is not only because Ghanaians have more children, but also because more generations live together. In Ghanaian social organization, family is the main source of emotional and financial security in old age and the primary or sole caretaker for the young. In many instances, the grandparents play a large role in raising the grandchildren and vice versa the grandchildren later care for the elderly family members while their parents are working to provide for the household.

### *Traditional Medicine*

This study explores childhood eye care, in terms of modern medicine, and it is important to grasp why many people in the region have had no previous modern eye services. According to the World Health Organization, traditional medicine is “the sum total of knowledge, skills and practice based on the theories, beliefs and experiences indigenous to different cultures that are used to maintain health, as well as to prevent, diagnose, improve and treat physical and mental illnesses.” Traditional healers play a very important and indispensable role in primary healthcare delivery in Africa. There are healers in almost every village in Africa, with the estimated healer to patient ratio of 1:350 (Courtright, 2000). Healers are a respected part of the community because of their acquired knowledge, age and ability to provide answers and treatments that are meaningful to the community, and their position is seen as part of the moral core of the community (Courtright, 2000).

It is important to understand traditional medicine and the power it has in the African community. In Ghana, modern medicine is relatively new while traditional medicine has been practiced for thousands of years. Traditional medicine is not only a part of Ghanaian culture but

also severely outnumbered modern medicine. The ratio of medical doctors in Ghana per population is 1:20,000 while the ratio of traditional healers is 1:200 (Tabi, 2006).

One of the oldest, most widespread and popular use of traditional medicine in eye care is a surgical practice called couching. This procedure is used to treat mature cataracts that are obstructing vision. A cataract is the clouding of the lens, which is the clear part of the eye that focuses light on the retina (Facts About Cataract, 2009). When performing couching, a traditional healer inserts a sharp instrument (often not sterilized) into the eye and pushes the clouded lens backwards into the vitreous cavity (Merabet, 2008). Studies show that couching results in significantly poorer vision post-operation and is associated with a much higher rate of complications and blindness in comparison to biomedical cataract surgery (Gilbert, 2010). Complete loss of sight has been seen in up to 50% of couching patients and complications such as corneal scarring, retinal detachment, glaucoma and optic nerve atrophy are common (Gilbert, 2010). Ophthalmologists have come to the conclusion that couching does more harm than good and is unsafe and inefficient as a treatment for mature cataracts.

#### *Patient Barriers to Eye Care*

Although blindness in the developing world is often curable, most do not receive proper eye care treatment. One recent study found that over 65% of adults over the age of 40, in a rural Indian population with low vision never sought eye care (Chang, 2008). One reason for this void of care is the lack of awareness about availability of treatments and services. Many people, especially older people, believe that blindness is an inevitable consequence of aging and do not know that there are options to prevent this blindness. Cultural beliefs can also play a part, as many societies believe that diseases may be caused by non-medical reasons and are 'God's will'. Religion and culture can also have a considerable influence on one's willingness to seek medical care.

In line with cultural beliefs and non-medical causes, many Ghanaians believe in witchcraft, demons, devils and evil spirits. A Ghanaian reporter recently interviewed 45 medical students and found that 41 of them believe witchcraft was responsible for existing medical problems in their patients (Ohene, 2012). This is due to the culture that these students were raised in. At the center of the issue is the simultaneous battle in their minds' between irrationality and rationality and these irrational parts, like witchcraft and superstitions, are very ancient and ingrained in Ghanaian culture.

Another significant obstacle that prevents people from receiving medical attention for their eyes is cost. Financial barriers are commonly cited as a reason why patients do not seek treatment, in fact a study done in Ghana found that 91% of respondents said it was the most important barrier preventing them from having cataract surgery (Gyasi, 2007). In addition to physical currency, there are also hidden costs that prevent people from seeking treatment or surgery. These hidden, unstated costs include lost work income, transportation, food and cost of medications. This can be especially difficult for women, who are expected to be taking care of the household and children, not traveling to visit a doctor.

While most Ghanaians are comfortable with traditional healers, many fear modern medicine and doctors and therefore avoid seeking medical treatment. Fear of the unknown and unfamiliarity can be a large barrier that prevents patients from receiving any medical care. In addition to fear of doctors and the unknown, many also fear the treatments and surgeries performed in modern medicine. All surgeries entail some risk, but the fear of a poor outcome can be enough to cause a patient to forego treatment. This fear is frequently worsened by a lack of understanding of the procedure and by hearsay of surgeries gone awry recently, or even decades prior. It has been said that for every unsuccessfully operation or treatment, five successful ones have to be performed to gain back the trust of the community.

### *Summary*

In conclusion, a lack of childhood ocular healthcare is a problem around the world. Because of this an estimated 1.4 million children in the world are now blind. There are many causes for this absence of care including poverty, lack of education and scarcity of educated ocular health professionals. The deficiency of eye care in Africa is especially alarming due to poor socioeconomic development and a cultural preference for traditional medicine. In Ghana specifically, there are many patient barriers that prevent patients from seeking treatment including lack of awareness, cost and fear. After reading this background information and research, my interest in Africans' understanding and judgment of modern healthcare grew and from that interest this project idea was born. I was specifically fascinated by the staggering number of childhood ocular issues and because of this I chose to investigate caretaker's perceptions and knowledge of the importance of childhood eye care. Ghana, a country that has one of the highest rates of Glaucoma in the world, seemed like the ideal location to perform this research.

## LIMITATIONS & DELIMITATIONS

Limitations are boundaries or challenges faced by the researcher that are beyond their control. Things of this nature that were faced while conducting this study included location of outreach clinics, privacy of interviews and language barrier.

- The villages in which the outreach clinics took place were predetermined by Unite For Sight and Charity Eye Clinic months before my arrival in Ghana
- All outreach clinics take place in public gathering spaces, such as churches and community centers, therefore privacy during the interviews was limited
- A vast number of different languages and dialects are spoken throughout the country in addition to English which presented a language barrier between the student researcher and interview participant
- Due to this language barrier almost all communication was done through a translator, who was speaking a language not understood by the student researcher, therefore there cannot be 100% validation that each questions was asked appropriately and without bias to each participant in this study

Delimitations are boundaries that are set by the researcher in order to control the range of the study. Things of this nature that were faced when conducting this study included the method of data collection, region of focus for interviews and the timeframe of the study.

- Paper survey questionnaires were the chosen method of data collection because of the brief time the interviewer would have with each participant and the remote location of the interviews. Also because of these reasons, as many yes/no questions were included as possible and the number of total questions asked was limited.

- Ashanti region was chosen as the specific area of focus for this research due to the numerous rural communities and because the majority of other previous studies in Ghana have focused on the more populated region of Greater Accra.
- The date of travel of August 2012 to Ghana with Unite For Sight was chosen because this time is the end of the rainy season in Ghana and therefore hopefully would produce higher attendance rates at the outreach clinics and because the student researcher was able to dedicate a month away from her academic studies due to summer break.

## RESEARCH DESIGN & METHODS

### *Study Overview*

This study was designed to be a quantitative examination of a rural sample of caretakers in the Ashanti region of Ghana. It was intended to be cross-sectional sample, as it was aimed at determining the prevalence of a problem, attitude or issue by taking a snapshot of the population. This was to obtain an overall picture as it stands at the time of the study and involved one-on-one contact with the study population. The sampling method used was non-probability or convenience sampling, as the individuals that participated were those that were available at the outreach visits. This method was used instead of a random sampling of participants, as this would not be cost-effective or feasible with such a large geographical area.

This thesis is a result of primary research that I conducted during an 8-day period in August 2012. I conducted and recorded a total of 152 interviews, which investigated previous history, knowledge and personal beliefs about children receiving eye care. The student researcher does not speak the native languages and communicated with the participants through a translator proficient in both English and the native languages. All participants also completed a poverty scorecard in the form of a survey with observable indicators, tailored specific to Ghana, to assess the poverty level. In the following sections, the research setting, subject population, eligibility screening, consent process and method of data collection will be described.

### *Research Setting*

The Ashanti region is the location of focus for this study. This region, as seen in Figure 1, is located in central Ghana and is the most populous and one of the most rapidly growing regions in the country with 4.4 million people as of 2006 (Ashanti Region, 2006). Although this region is

the most populace, its density (148.1 people per square km) is lower than those of the Greater Accra (895.5 people per square km) and the Central (162.2 people per square km) Regions (Population Characteristics, 2006). About 47% of the population lives in the rural areas of the region (Ashanti Region, 2006). This area is the second richest district in Ghana and has the second largest gold reserves in Africa (Gold Mining in Ghana, 2010). In addition to gold, a large source of economic income comes from agriculture, 44.5% of the population is employed in this sector (Ashanti, 2006). 77.5% of the population identifies themselves as Christians and religion plays a large part in the region's culture (Ashanti, 2006).



**Figure 1. Ashanti Region, Ghana**

As with Ghana as a whole, education is lacking in the region. 35% of the population, age 15 years and older, are illiterate (Ashanti, 2006). Information on levels of education show that between 40-50% of the population, particularly females, have no formal education or have only pre-school education (Ashanti, 2006). Only between 16.1-22.4% of the population have attained an education above junior secondary school (equivalent to junior high or middle school in the

United States) and between 3.4-10.4% attend senior secondary school (equivalent to high school in the United States) (Ashanti, 2006).

Kumasi is the capital and largest metropolitan area of the Ashanti region with 1.4 million people (Ashanti Region, 2006). This community is the second largest city in Ghana and is approximately a six-hour drive north of Accra (Ashanti, 2006). Kumasi is one of three cities in Ghana that the five Unite For Sight-supported clinics are based. One of these clinics, Charity Eye Center, is headquartered in Kumasi and works with Unite for Sight to run community outreach eye clinics in the Ashanti region. Charity's outreach team consists of an optometrist, ophthalmic nurses, and Unite For Sight volunteers. This team was transported by van each day to surrounding villages to provide much needed eye care to the rural population. These remote rural villages range from one to three hours of driving distance from Kumasi. Once the outreach team arrived at the village, 50 to 200 patients received an eye exam, diagnosis, eyeglasses, medication and treatment. Patients requiring advanced ophthalmic care and surgery were transported from the village to Crystal Eye Clinic's surgery center in Kumasi. During eight of these outreach clinics, the student researcher interviewed clinic participants about the children in their care, the eye history of these children and the caretaker's perception of modern eye care.

### *Subject Population*

The population of subjects that participated in this study was restricted to people who are caretakers of children. Besides being a caretaker of children, there were no other restrictions, such as gender, age or ethnic group. Pregnant women were permitted to participate, as they were only simply surveyed, as long as they already had children or care for children. The majority of the subjects in this study were from vulnerable populations because they were likely to be non-English speakers and/or non-literate participants. This issue was addressed by the use of translators and verbal oral consent. Oregon State University Institutional Review Board reviewed

and approved the project protocol, recruitment guide, verbal oral consent script and the interview survey.

### *Survey Questionnaire Design*

The survey questionnaire used in this research project was created in partnership between the student researcher and Unite For Sight administration staff. In designing this research project, the first step was to choose the general topic and research questions. After the research questions were carefully selected based on information learned in the literature review, the questionnaire questions began to take shape. When constructing the survey, it was important to make sure that the questions directly relate to the research questions. Furthermore, it was important that the surveys and interviews were not extremely time-consuming (ideally within a 10-20 minute limit). Also since an interpreter was going to be used, simple questions are better and easily interpreted questions avoid ambiguity and lead to more accurate results. Keeping these ideas in mind, the student researcher and Unite For Sight administration staff were able to create and strategically designed the survey questionnaire to best find answers to the research questions of this research project.

### *Eligibility Screening and Recruitment*

Participants were screened for eligibility for this study based on whether he or she was a child caretaker. This was determined by having the translator read the recruitment guide (See appendix A) to potential participants. Following this, the translator introduced the project and interviewer and asked if the participant had any questions about the study. The potential participant was then asked if they were a mother or a caretaker of children, and if the participant responded yes, the participant was then asked if they would be willing to

participate in the research study. Participation in this study was purely voluntary and participants were told as such. No compensation or reward was given. To ensure that participants did not feel pressured or obligated to be involved in the study to receive eye care at the outreach clinic, the study took place at the last station of the outreach visit. Patients were registered, given an eye exam by the local eye doctor, and given medicine and glasses if needed, before they reached the research location.

### *Consent Process*

This research study received a waiver of documentation of informed consent. While English is the official language of Ghana, participants in this study spoke a variety of local languages and dialects, making it impossible to translate written informed consent forms into all of the languages that were encountered. In addition, participants may have been non-literate and would not have been able to give informed consent through signed forms. Once the participant was recruited and screened to be eligible to participate, the translator read the oral consent script (see Appendix B). This was read before any study activities started to ensure full consent from the participant. If consent was verbally granted, the interview then progressed into the survey portion.

### *Method of Data Collection*

The measurement tool used in this study was a survey questionnaire (see Appendix C) that was completed during one-on-one interviews using a translator. Each village provided an English-proficient translator for the interviews to ensure language comprehension of each local dialect. Before prospective participants were approached each translator was trained in the importance of standardization and consistency of each interview and the danger of biases. Each

translator was also informed about the importance of confidentiality to ensure the privacy of each participant.

Once recruitment, eligibility screening and consent were complete, the participant then completed a poverty scorecard (see Appendix C). This was done by the translator asking the participant a set of ten questions, created specifically for Ghana, that were then computed to determine the poverty level of each participant. Each question was assigned a point value and when the points from each question were added up, the total gave a poverty score, which ranged from 0-100 (0 being the most likely to be poor and 100 being the least likely to be poor). Poverty scorecards were a requirement of Unite For Sight but also were an effective and practical way to assess and identify the likelihood of poverty.

After the poverty scorecard questions were complete, the interview then moved onto the survey portion. The first two questions were the age of each child and the participant's relation to the children (mother, grandfather etc.). The next section was surveying the participant about the child's eye health history. This portion was done by asking four yes or no questions and if any answers to a question where a yes, the participant was asked to explain further. The remaining section consisted of four questions aimed at flushing out the education level and knowledge of the participant in regards to eye care. These questions ranged from yes/no questions to open-ended questions. In total, the interviews ranged from 10 to 15 minutes in total length, depending on the participant.

#### *Anonymity and Confidentiality*

Each participant was assigned a study number, which is the only identifier for the data collected from that participant. No names or addresses were collected. Each participant's answers to the survey questions were recorded on a paper copy of the survey by the interviewer

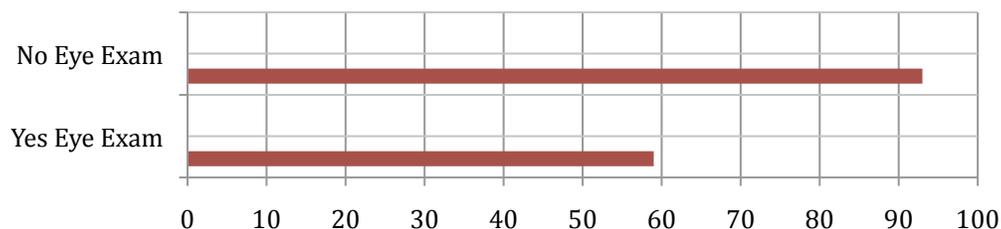
as the participant answered each question. These paper copies of the survey were with the student researcher at all times during the outreach clinic. Each night after each outreach clinic was finished, the student researcher input the data into a password-protected Excel spreadsheet on a laptop. After the study was complete, the data will be kept in digital format for the next three years.

## RESULTS

The raw data from the 152 questionnaires were put into an excel spreadsheet and then analyzed to produce the results shown below.

***Research Question #1: What percentages of caretakers reported that their children have had an eye exam in this region? If the child has not had an eye exam, why?***

Of the 152 caretakers interviewed, 93 participants responded that none of the children in their household have ever had an eye exam. 59 caretakers said at least one of the children in their care either previously had an eye exam or just received one at the outreach clinic. Therefore 61.2% of the caretaker's children have never had an eye exam while 38.8% have had an eye exam. Of those 58 yes responses, the age of the child receiving the eye exam ranged from 9 months to 17 years and an average age of 9.83 years old. 43 of the caretakers whose children had received an exam had their first eye exam at the outreach clinic where the interview took place.



**Figure 2. Research Question #1, previous eye exam**

Of the 93 participants who said none of their children had an eye exam, the majority (72% or 67 caretakers) said the child had not had an eye exam because the child had not complained of any eye problems. 10 participants (10.8%) responded that the child was not able to come to the clinic to receive an exam, 8 participants (8.6%) responded they did not know children were allowed at the outreach clinic, 7 participants (7.5%) said because of financial reasons and 1 participant (1.1%) said they did not know why the child had not had an eye exam.

### Why Had the Child Not Had an Eye Exam?

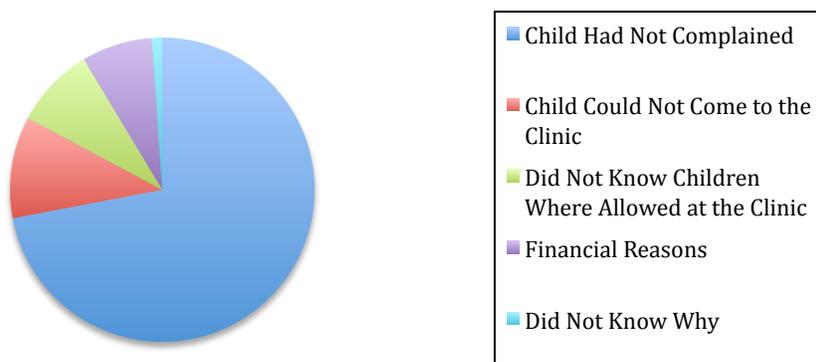


Figure 3. Research Question #1, reasons for no exam

**Research Question #2: What is the prevalence of eye problems for children within this region?**

**What were the most common complaints?**

79 participants out of 152 total reported that at least one child (age 0 to 17) in their household had problems with their eyes. This is 52% of the caretakers interviewed.

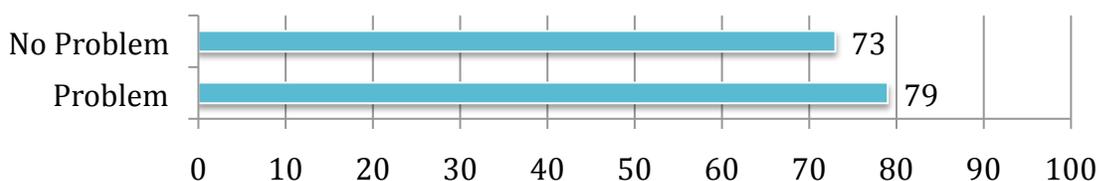
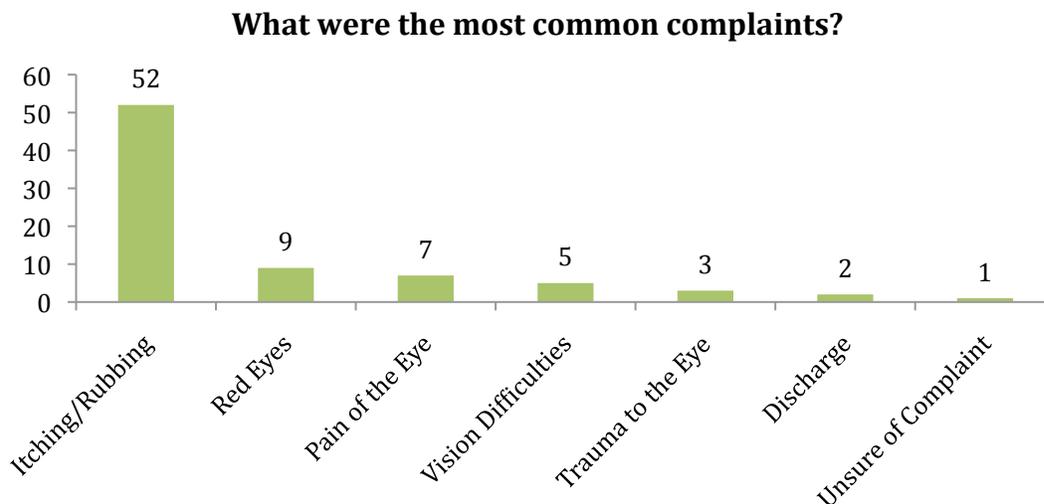


Figure 4. Research Question #2, prevalence of eye problems

52 caretakers (65.8%) reported the child's complaint was itching or rubbing of the eye. Of the remaining participants: 9 (11.4%) reported red eyes, 7 (8.9%) reported pain of the eye, 5 (6.3%) reported vision difficulties, 3 (3.8%) reported trauma to the eye, 2 (2.5%) reported discharge around the eye and 1 (1.3%) was unsure of what the child's complaint was.

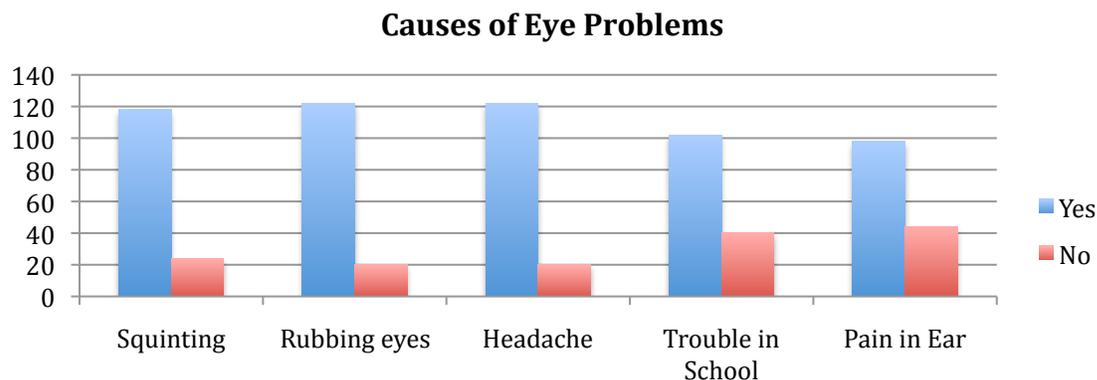


**Figure 5. Research Question #2, common complaints**

***Research Question #3: To what extent do caregivers know about the causes of eye problems in this region?***

This research question was approached by giving the participant a list of possible symptoms and asking whether each symptom could be caused by an eye problem. Out of 152 participants, 10 either did not understand the line of questioning or chose not to answer. When asked if a child rubbing their eyes was indicative of an eye issue, 122 out of 142 (86%) answered yes and 20 (14%) answered no. The participants were then asked if a child squinting would be caused by the child having problems with their eyes, 118 (83%) responded with yes and 24 (17%) responded with no. When asked if a child having a headache could be caused by an eye problem, 122 (86%) said yes and 20 (14%) said no. Next the caretakers were asked if a child having a hard time seeing their schoolwork could be caused by an eye problem, 102 (72%) responded with yes and 40 responded no. The final symptom asked was if an eye issue could

cause ear pain, 98 (69%) said yes and 44 (31%) said no.



**Figure 6. Research Question #3, eye problem causes**

***Research Question #4: How do caregivers react to and treat eye injuries in children?***

This research question was investigated by giving the participant an example of a situation that would cause a child to receive an eye injury and asked how they would respond. The example given was if a child were hit in the eye with a stone what would the caretaker do. 131 out of 152 participants (86.2%) responded that they would take the child to a hospital or doctor for treatment. Of the remaining 21 participants, 13 reported they would try to flush the eye with water, 4 would try and remove the stone, 2 would just cry and pray and 2 said nothing can be done to save the eye so they would do nothing.

### Reaction to Childhood Eye Trauma

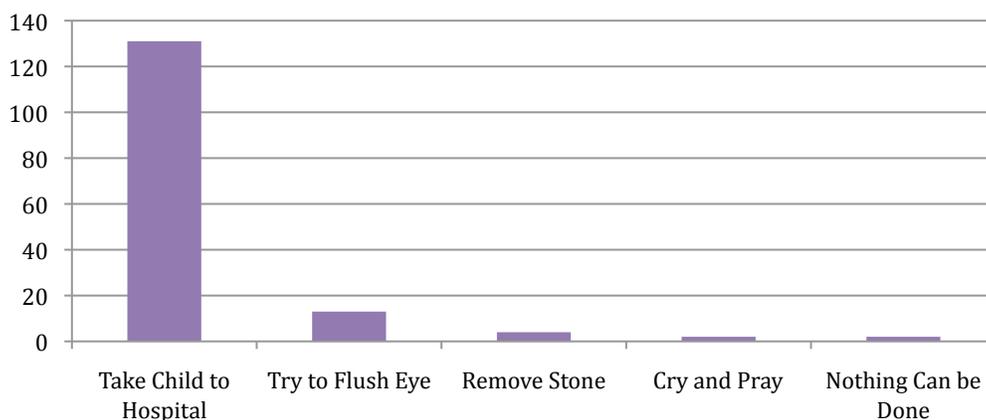


Figure 7. Research Question #4, reaction to eye trauma

***Research Question #5: In this region, do caretakers believe children in their household would benefit from having an eye exam by a professionally trained eye doctor? Why or why not?***

This final research question was asked directly to the participants. Out of 152 contributors, 136 caretakers (89.5%) believed that children in their household would benefit from an eye exam by an eye doctor. The remaining 16 participants (11.5%) said they do not believe children benefit from being examined by an eye doctor. Of those 136 participants, 108 caretakers believe a child would benefit from seeing an eye doctor so the doctor can treat and correct eye problems. 24 participants believed children should have an eye exam to prevent future problems and blindness. 2 caretakers said children should have eye exams so they can do better in school and 2 other participants responded that children should have eye exams because the participant had seen other children improve after seeing an eye doctor. Of the 16 caretakers that believe children would not benefit, 8 people believed children do not need eye exams, 6 people did not know why children would benefit and 2 participants said children do not get eye diseases.

### Do Children Benefit From Eye Exams?

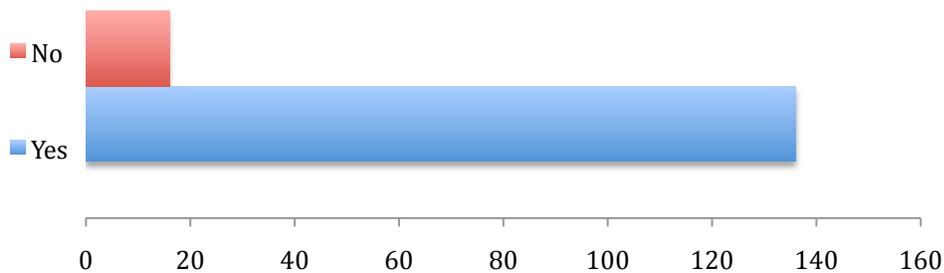


Figure 8. Research Question #5, benefit to children

#### Reasons for Yes

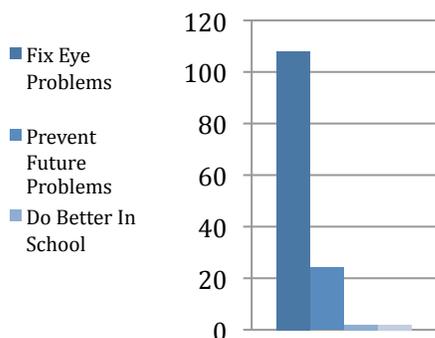


Figure 9. Research Question #5, reason for benefit

#### Reasons For No

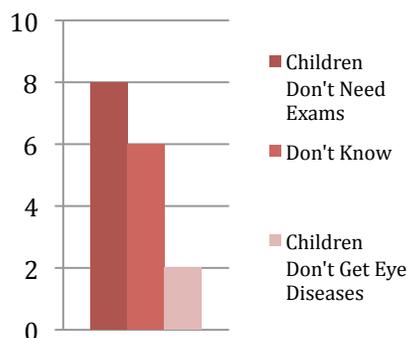


Figure 10. Research Question #5, reason for no benefit

## DISCUSSION & CONCLUSION

In this study, I explored the level of compliance, knowledge, prevalence, reaction and awareness surrounding childhood eye care by caretakers living within the Ashanti region in central Ghana. Consistent with my research findings of eye care in Africa, I found overall a low level of compliance and a high prevalence of eye problems. Some results were unexpected, like finding a high level of proper reaction to trauma to the eye. While other findings were congruent with previous studies, showing a mixed level of education and knowledge in relation to eye health. Overall, I believe I found a much larger level of awareness and trust in modern medicine than I believed there to be in this region, previous to this study.

This project was aimed to investigate compliance and trust in modern medicine in this region by determining what percentages of children had an eye exam by a professionally trained optometrist. Of the caretakers interviewed, the vast majority of the children in the caretakers' care had never had an eye exam and while a much smaller minority amount had an eye exam. The amount of children who have never had an exam seems like a large amount but this amount is actually only slightly elevated. Even in developing countries, such as the United States, many parents do not take their children to see an optometrist unless they notice a need for such care. This usually comes in the form of the child complaining, failing a vision screening at school and/or an injury occurring to the eye. The amount of children who have never received an exam may be slightly elevated due to a lack of vision screening at schools and a lack of parental knowledge about how to respond to trauma/injury to the eye in children.

The average age of the pediatric patients seen at the outreach clinics in this region is difficult to relate to other regions of the world because the patients were seen for such a large range of problems. Many of the older pediatric patients were seen for refraction error (needing glasses) and many of the youngest patients were coming in for eye irritations (allergies, infection

and/or conjunctivitis), but there was such a large range of issues for each age group that the average age of the patient does not correlate to any specific reason. Also a majority of the pediatric patients who had an exam, had their first comprehensive eye examination at the outreach clinic. This is an impressive statistic because it shows that Unite For Sight's outreach clinics are providing many children with their first eye examination and providing care that may treat issues that would have gone untreated without these outreach clinics.

The follow-up inquiry examined why the child had never had any eye exam. The majority of the caretakers, who responded "no" to the previous question, stated the child had not had an eye exam because the child had not complained of any eye issues. This is a common statement by parents in both developing and developed countries because they assume nothing is wrong with the child's eyesight or eye health until the child mentions something. The problem with this is if the child has only ever known their eyesight to be poor they will not realize there is a problem. In the United States this dilemma is addressed by vision screenings at schools, day care programs, churches and health departments. These screenings are performed periodically throughout childhood, this is to ensure early detection because the earlier a problem is detected the better chance to obtain maximal vision through treatment. In some states a documented vision screening is required before the child can begin school.

I believe that vision screenings would be an efficient and cost-effective method to identify children with visual impairments or eye conditions in this region. These screenings would only require a penlight, an age-appropriate eye chart and the proper training to identify different reactions. Vision screening are able to detection amblyopia (lazy eye), strabismus (cross-eyed), refractive errors such as myopia (nearsightedness) and hyperopia (farsightedness), astigmatisms and other serious conditions such as cataracts, glaucoma and neurological diseases. If any of these problems are detected the child could then be referred to go see an optometrist or ophthalmologist at an outreach clinic. This process would increase the likelihood that children

who need proper care to prevent permanent visual impairments are aware of the eye issue and seek professional medical attention.

The remaining reasons for why the child had never had an exam included the child was not able to come to the clinic to receive an exam, the caretaker did not know children were allowed at the outreach clinic, lack of money for the entrance fee or medication fee and the caretaker did not know why the child had never had an eye exam. The majority of these reasons could be prevented by increased communication and education about the outreach clinic to the caretakers. If more notice and information about the outreach clinic was circulated to the village before the clinic was to take place, I believe more caretakers would make more of an effort to get the child to the clinic. Also I believe letting everyone in the village know that the clinic is open to all ages would increase pediatric turnout.

The next inquiry was designed to find out the prevalence rate of eye problems in children in this region. More than half of all caretakers reported that at least one of the children in their care complained of an issue with their eyes. Much less reported that one of their children had received an eye exam which means many children complained of an issue with their eyes but never received an eye examination. This could be due to numerous reasons including the reasons discussed previously for why the child had never had an exam. I believe this number could be reduced through implementing the steps I outlined above, including free vision screening in schools, which would send the child home with a note letting the caretaker know the child is in need of a comprehensive eye exam, and also increased awareness and communication about upcoming outreach clinics in the area.

The follow-up then sought to find out what the most common eye issues found in children in this region. The majority of caretakers reported the child's complaint was itching or rubbing of the eyes. In most cases, itchy eyes are caused by allergies, which can be treated by oral antihistamines (such as Claritin) or eye drops with antihistamines and decongestants in

them. These eye drops were prescribed to the patients at the clinic and available to purchase at a reduced cost as well. The next most common complains included pain, discharge and redness of the eye, all of which are symptoms of infection in the eye. Patients who were diagnosed with an eye infection were prescribed antibiotic eye drops, which were also available to purchase at the clinic for a reduced cost. The remaining caretakers reported vision difficulties and trauma to the eye. Patients with myopia (nearsightedness) were prescribed the appropriate reading glasses and patients with hyperopia (farsightedness) were referred to Charity's main clinic in Kumasi to be refracted and have glasses ordered. Patients with trauma to the eye were evaluated and if treatment could improve sight, they were assigned a surgery day to see the ophthalmologist in Kumasi. Over all, I believe the pediatric patients that were present at the Unite For Sight outreach clinics were treated to best of the outreach clinic staff's ability and received sufficient care.

The next inquiry was intended to test the caretaker's knowledge of symptoms or causes of eye issues. The caretaker was given a list of five symptoms or results and asked to identify if each could be due to an eye problem. Four of the symptoms could be due to an eye problem while the fifth one does not. This fifth symptom/result was inserted into the question to test if the participant was just saying yes to every symptom/result without really knowing or understanding if they could be due to problem with the eyes. The five symptoms were: headaches, ear pain, rubbing of the eyes, squinting of the eyes and having a hard time seeing schoolwork. The symptom of ear pain was the symptom/result that does not relate to a problem with the eye. The cause of ear pain is usually an issue in the ear or a teeth/mouth problem.

The vast majority of caretakers said yes to rubbing of the eye, yes to squinting of the eyes, said yes to headaches, said yes to having difficulty seeing schoolwork. More than half of all caretakers also said yes to ear pain being a symptom of an eye problem. This information shows more than half of all caretakers either believes ear pain is a symptom of an eye problem or

said yes because they believed it was what I wanted to hear. Either way, this shows an area for improvement in terms of education. For more caretakers' to be aware of when the child needs to see an eye care professional an increase in education needs to take place. This education could begin at the outreach clinic, by beginning each clinic with a lesson in basic eye health education and including signs and symptoms to be conscious of. For further awareness and understanding, a talk on pediatric eye health given to the whole village in the native language would increase education and knowledge the most.

The next inquiry was investigating how caretakers would react to and treat an eye injury in a child in this region. This idea was probed by asking the caretaker if a child were hit in the eye with a rock, how would they react. A resounding majority said they would take the child to a doctor or to the nearest hospital. This was a pleasantly surprising result because of the history and culture surround traditional healers in the country. I was expecting many participants to either say take the child to the village healer or apply medicine made by a village healer. In fact, not a single person said anything about traditional medicine. I believe this shows a much greater trust in modern medicine than I previously thought or expected from this study.

Participants' other responses to how they would react to an eye trauma included nothing could be done, flushing the eye with water, removing the object, crying and praying. All of these responses follow more closely with the traditional or more historical ideas and treatments. While none of these responses are wrong per say, they would not result in the child's best interest and the greatest outcome for long-term sight and eye health. I believe this is another topic that a lecture on pediatric eye health could touch on and inform caretakers that trauma or injuries to the eye need immediate attention from an optometrist or ophthalmologist.

The final inquiry was aimed at finding if the caretakers' saw any advantage in children receiving a comprehensive eye examination. It was approached by directly asking the participants if they thought the children in their care could benefit from an eye exam. Almost all

of the caretakers said they believed that children in their household would be aided by being seen by a professionally trained eye specialist. This result, like the previous question, shows a high level of trust in modern medical practices in comparison to traditional healers. While this is not saying that the participants no longer rely on the services of the village healer, it is saying that the vast majority of the participants at least see the benefits and advantages of consulting an optometrist or ophthalmologist in regards to the child's eye care.

Participants were then asked why they believed children would benefit or why they did not believe children would benefit. The majority of caretakers said children could benefit from an eye exam because the eye doctor could treat and correct problems. These results again show that many participants believe in modern medicine practices and trust the practitioners to treat and remedy the problem. Another common response was that eye exams are beneficial to prevent future troubles such as blindness. This can be true if the problem is caught and treated early, but it also important make sure that people in this region are not expecting miracles. Modern medicine can successfully prevent and treat many more eye conditions than traditional medicine but the abilities and practices of medical procedures can only do so much.

For example, a young man in his early thirties came to one of the clinics, completely blind and being led in by his children. This man was examined by the optometrist, who found mature corneal ulcers in both of the man's eyes, which had completely destroyed his corneas. Corneal ulcers are an infection of the cornea that can be treated with early diagnosis and intensive fortified antibiotic therapy. Unfortunately for this man, the infection had developed several years ago and there was nothing the doctor could do to reverse this man's blindness. This man and his family were not pleased about this news because they had heard from others in the village that these doctors could make him see again. It is situations like this that need to be closely monitored because while doctors can remove cataracts and treat infections, they cannot perform miracles. It is important for patients in this region to have a pragmatic idea of the

possible outcomes and to try to eliminate unrealistic expectations, such as eye doctors can make anyone see again. The other responses included, participants who said children can perform better in school after eye exams and that they believe eye examinations are beneficial because they have seen other children improve after seeing an eye professional.

Very few participants said they believed children would not benefit from a comprehensive eye examination. Of those that said children do not need eye exams, the reasoning for why included children do not get eye diseases and the caretaker did not know why children would benefit. All of these participants are either misinformed or uninformed and the only solution is increased education. A lecture of pediatric eye health would help to resolve these myths and reeducation these mislead caretakers.

In conclusion, my finding for this research project found a great confidence in modern medical practices in the people of this region than previously believed. This was an unexpected result but a positive one as this greater trust in modern medicine will optimistically begin to translate to a great level of eye care and general health care for the people of Ghana. This in turn will hopefully lead to an increase in quality of life and life expectancy in this region. But until that time comes, my current findings uncovered a high prevalence rate of eye problems and a low rate of previous medical treatment for those problems in children. In the near future, I recommend developing a vision-screening program for the school system of Ghana that would be repeated at various stages of childhood development to continuously check the children's eye health. I believe this program would help identify children that need a comprehensive eye examination and inform caretakers about this necessity. The vision-screening program could then refer them to the closest optometrist office or suggest clinics provide by NGOs such as Unite For Sight's outreach clinics. I also believe that more education is needed for caretakers about childhood eye care and eye health in general. This could be accomplished by a providing a short lecture before each outreach clinic and not only address basic eye health but also pediatric eye

care as well. One final recommendation would be to increase the amount of eye professionals, ophthalmic nurses and optometrists, in these rural areas so they could be most accessible then just whenever the NGO clinics decide to visit.

Overall, this experience, the trip to Ghana and developing this project, has been life changing. I not only got to experience life in a foreign country but also a drastically different culture and customs during my trip. I was able to encounter another country's healthcare system and also observe numerous cases of eye pathology that I would not be able to come into contact with in the United States. In developing this project, I also did countless research about the optometry field and the eye care system in the United States that I would not have done otherwise. I believe this entire experience will one day make me a better optometrist, having gained this understanding and knowledge that I would not have without this project. I also hope to be able to travel to countries like Ghana, once I have the professional training to make even more of a difference in these developing countries.

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## APPENDICES

### *Appendix A: Recruitment Guide*

I am doing a study titled “Perception of Children’s Eye Care from Mothers and Caretakers in Ghana.” The principle investigator is Dr. Ray Tricker. This study will consist of a short 10-15 minute survey and is for research purposes.

Anyone who is a mother or a caretaker of children can participate in this study. Participation is completely voluntary and you can leave at any time.

If you would like more information or would like to talk to someone about this research project you can contact Friends Eye Center or Charity Eye Center. You can also speak with the local community health worker who advertised this outreach as well.

1. Are you a mother or caretaker of children?
2. (If yes to above question) Would you being willing to participate in this research study today?

### *Appendix B: Oral Consent Guide*

You are being asked to participate in a research study about your perceptions as a caretaker in regards to child eye care. Your participation in this study will allow Unite For Sight and its partner clinics in Ghana to better focus resources in your community.

This study primarily concerns your knowledge and perception about the importance of eye care for children. All data is recorded anonymously and no personal identifying information will be collected.

Your participation in this study is voluntary. Your refusal to participate will in no way affect the level of care you will be provided. There are no known risks associated with participating in this study. You may skip any questions that you do not want to answer. The estimated time to complete this survey is approximately 15-30 minutes.

This project is being conducted by Lianna Lowe under the supervision of Ray Tricker, Oregon State University. This project was approved by Oregon State University's IRB on July 31, 2012.

If you have any further questions about this study, you can speak with a member of the eye clinic staff, in person, today. Please let me know if you would like to speak to someone and I will point out this person or take you to this person at anytime. You can also speak to the local community health worker who advertised the outreach or the clinic staff member who will be returning to the village every month if you would feel more comfortable.

***Appendix C: Survey Questionnaire & Poverty Scorecard***

1. What are the ages of any children in the household?
2. What is your relationship with each child? (i.e. mother, father, grandmother, aunt)
3. Have any children in your household aged 0 to 17 had an eye exam by an eye doctor? If yes, which age, and how long ago was the exam?
  - A. No
  - B. Yes: \_\_\_\_\_
4. Have any children in your household aged 0 to 17 had any problems with their eyes? If yes, which age? Please describe the problem.
  - A. No
  - B. Yes: \_\_\_\_\_
5. Do any children in your household aged 0 to 17 wear eyeglasses? If yes, which age? Where did you receive the glasses?
  - A. No
  - B. Yes: \_\_\_\_\_
6. Have any children in your household aged 0 to 17 had any previous eye treatment? If yes, which age? Please describe the treatment.
  - A. No
  - B. Yes: \_\_\_\_\_

Perceptions of Eye Care

1. Please say Yes or No if you think these symptoms could be caused by an eye problem. Demonstrate symptom if necessary.
  - i. Squinting
  - ii. Rubbing eyes
  - iii. Headache
  - iv. Trouble in school
  - v. Pain in ear
2. Have you personally ever brought any children in your household aged 0 to 17 to receive eye care? Why or why not?
  - A. No: \_\_\_\_\_
  - B. Yes: \_\_\_\_\_
3. Do you think that children in your household aged 0 to 17 would benefit from an eye exam by an eye doctor? Why or why not?
  - A. No: \_\_\_\_\_
  - B. Yes: \_\_\_\_\_
4. If a child has sudden trauma to the eye (hit with stone, etc.), what would you do?

**Figure 1: A simple poverty scorecard for Ghana**

<u>Entity</u>	<u>Name</u>	<u>ID</u>	<u>Date</u> (DD/MM/YY)
Participant:	_____	_____	Joined: _____
Field agent:	_____	_____	Today: _____
Service point:	_____	_____	Household size: _____

<u>Indicator</u>	<u>Value</u>	<u>Points</u>	<u>Score</u>
1. How many members does the household have?	A. Seven or more	0	
	B. Six	6	
	C. Five	8	
	D. Four	11	
	E. Three	15	
	F. Two	23	
	G. One	31	
2. Are all children ages 5 to 12 in school?	A. No	0	
	B. Yes, or no children ages 5 to 12	4	
3. What is the highest grade completed by the female head/spouse?	A. No female head/spouse	0	
	B. None or pre-school	4	
	C. Primary or middle	7	
	D. Any JSS, SSS, S, L, U, or higher	10	
4. Is the main job of the male head/spouse in agriculture?	A. Male head/spouse has no job	0	
	B. Yes, main job is in agriculture	8	
	C. No, main job is not in agriculture	10	
	D. No male head/spouse	10	
5. What is the main construction material used for the roof?	A. Palm leaves/raffia/thatch, wood, mud bricks/earth, bamboo, or other	0	
	B. Corrugated iron sheets, cement/concrete, asbestos/slate, or roofing tiles	3	
6. What is the main source of lighting for the dwelling?	A. Not electricity (mains)	0	
	B. Electricity (mains)	5	
7. What is the main source of drinking water for the household?	A. Borehole, well (with pump or not, protected or not), or other	0	
	B. River/stream, rain water/spring, or dugout/pond/lake/dam	5	
	C. Indoor plumbing, inside standpipe, sachet/bottled water, standpipe/tap (public or private outside), pipe in neighbors, water truck/tanker, or water vendor	7	
8. Does any household member own a working stove (kerosene, electric, or gas)?	A. No	0	
	B. Yes	10	
9. Does any household member own a working iron (box or electric)?	A. No	0	
	B. Yes	6	
10. Does any household member own a working radio, radio cassette, record player, or 3-in-1 radio system?	A. None	0	
	B. Only radio	2	
	C. Radio cassette but no record player nor 3-in-1 (regardless of radio)	6	
	D. Record player but no 3-in-1 (regardless of radio or cassette)	9	
	E. 3-in-1 radio system (regardless of any others)	14	