Abstract
Preventable blindness is one of the primary health concerns in rural India. Causes of visual impairment include injury, nutritional deficiency, lack of access to UV rays, and strain due to fine acuity needs. The extent to which eye disease manifests earlier in life is yet unknown, as epidemiological ophthalmological investigations in this population are rare. Using a database from the Srikanar Institute of Ophthalmology in Kakinada, India, major diagnosable issues experienced by Indian school-age children were identified and their prevalence estimated. Descriptive statistical analysis was completed on the data for patients under 18 years of age identified through school visits. Basic refractive impingement, including degrees of astigmatism, was most prevalent, followed by squinting. Vitamin A deficiency was not a factor in any of the tested subjects. The gender, age and relative grade of the students were associated with the onset of specific issues. Subclinical disease, possibly indicative of metabolic or physiological issues, was not measured in this study. The most common ophthalmological presentations can be easily addressed through the provision of accommodating eyewear. Through further research, more preventative and treatment options can be made available for rural Indian students.

Institute background
India is home to approximately 1 billion of the world’s 6 billion inhabitants (1). However, of these 1 billion people almost 60% live in destitution well below the poverty line, and live in rural villages throughout the country (1). Prevalent in these rural villages is ophthalmological disease. With a lack of resources to accommodate affected individuals, treatment is not being provided. However, the efforts of one man’s mission to make a difference has changed the lives of over 1 million people in India. Dr. Sankurathri, an Indian native and Ottawa resident up until 1988, is responsible for this. After a tragic plane accident claimed the lives of his wife and 2 young children in 1985, Dr. Sankurathri was left contemplating what to do next. After discovering that Kakinada home and quitting his job, he returned to India and created a foundation in memory of his beloved wife (2). He also built a school and an eye hospital (2). From here, the Srikanar Institute of Ophthalmology was the forefront in medical and treatment for eye issues in the Indian state of Andhra Pradesh.

Methods
The data within the Srikanar dataset was gathered from various eye clinics set up throughout a rural area of India close to Kakinada, where the institute is located. In this study, descriptive statistical analysis was completed for the 8488 students 18 years old and younger in Srikanar’s clinical database. Bivariate statistical analyses were used to explore relationships between clinical and demographic measures: chi-Square and independent samples t-tests were employed to test the association between gender, age, and grade with each of 16 outcomes.

Results
Within the dataset, there were a total of 8488 students 18 years old and younger, of whom 4299 (50.6%) were males and 4189 (49.4%) females. The age distribution of the students was normal, with 729 (8.6%) aged from 0 to 6 years, 4920 (58%) aged 7 to 12 years and the remaining 2839 (33.4%) aged 13 to 18 years. After examination, 4774 (56.2%) students received no diagnosis of an ophthalmological issue, while the most common diagnoses were refraction errors (2927; 34.5%), squinting (239; 2.8%) and swelling (108; 1.3%). There were 128 (1.5%) of children who received multiple diagnoses within their visit.

Discussion
In the rural Indian children population, ophthalmological issues are very common and debilitating. Refraction errors (astigmatism) were the most common occurrence in other studies including a Swedish study of children’s ophthalmological evaluation where astigmatism and refractive errors accounted for most common results after screening (3). Strabismus was also found commonly in a study pertaining to children adopted from Eastern Europe and in our study Strabismus was seen in 96 (1.1%) of the children examined (4). Strabismus included various diagnoses within this age group including alternating esotropia, hypotropia, hypertropia and amblyopia.

In total, 43.8% of the population in this study was diagnosed with ophthalmological disease, which indicated poor management and treatment options in this country. This number indicates that with so many children experiencing eye disease, there could be a large population of adults in the future incapable of sight. This population could be nearly impossible to employ and this would lead to greater levels of poverty in the country. A study from the Canadian Journal of Ophthalmology also coincided with our findings that astigmatism was the most common issue within the school age children population of India and that the provision of accommodating eyewear could address most of these issues (5).

Further research on the current availability of treatment and the accessibility of these treatments will allow us to understand why the majority of this population goes untreated and allow us to develop more integrated and effective strategies in providing treatment and help to this desperate population.

A weakness with this study is the database that was used. The information presented was originally intended to be used for solely clinical activity and was not optimized for statistical analysis. The data was undocumented and so errors in initial input and coding may exist.

Conclusion
The prevalence of ophthalmological issues among school-aged children in rural India was quite high (43.8%), suggesting poor treatment and management of these diseases by the current health care system. With so many ophthalmological diseases present in the children, if no treatment is provided then this population will grow up with a serious impairment and will be left without vision. The most common issues were not surprising, as multiple research studies involving children and sight impairments have had similar results. Studies from children in both the Western and Eastern parts of the world have noticed the increased prevalence of astigmatism in the child population in contrast to adults (6). Sight is a crucial part of our everyday lives and it is important to address these issues in countries where health treatment is insufficient. It was determined that 80% of all learning during a child’s first 12 years of life is visual (7). With this lack of vision, children in India may experience barriers in learning and this could result in high drop out rates and less population able to work in the future.

References

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