

# Teleophthalmology: A Case of Eye Care Delivery

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## ABSTRACT

As a result of COVID-19, a new approach for delivering eye care services to rural underprivileged areas were needed to improve eye disease outcomes. Sitapur Eye Hospital used a door-to-door model of medical delivery to alleviate the inability of rural residents from not receiving appropriate eye care during the COVID-19 pandemic. Sitapur Eye Hospital utilizes a healthcare delivery model that involves visiting patients door-to-door. The total number of patients that Sitapur Eye Hospital examined went from screening no patients in the months of April and May to screening 31,017 patients via the door-to-door service that was implemented in June 2020. Sitapur Eye Hospital managed to keep the prevalence of people who had severe eye impairment at pre-pandemic levels by offering a door-to-door service to patients who were unable to access appropriate medical care. The door-to-door healthcare model shows that leveraging telehealth and ride-hailing services alleviate certain barriers that make it difficult for people in rural areas to access eye care.

## KEYWORDS

COVID-19, Delivery, Eye Care, Mobile Health, Telemedicine

## INTRODUCTION

Visual impairment is a widespread problem that affects nearly 2.2 billion people worldwide, with most cases being either preventable or curable (WHO, 2021). Cataracts and glaucoma are the leading causes of blindness, with 94 million cases of cataracts and 7.4 million cases of glaucoma being diagnosed by 2018 (WHO, 2021). A study based in India recorded 18.7 million cases of blindness in the year 2000 (Dandaona et al., n.d.). Of those 18.7 million cases, 9.5 million were related to cataracts alone (Dandaona et al., n.d.).

Sitapur Eye Hospital (SEH) recognizes that blindness may be the consequence of neglected eye care in underprivileged communities. A study using data from the Behavioral Risk Factor Surveillance System, showed that those with self-reported moderate to severe visual impairment were approximately

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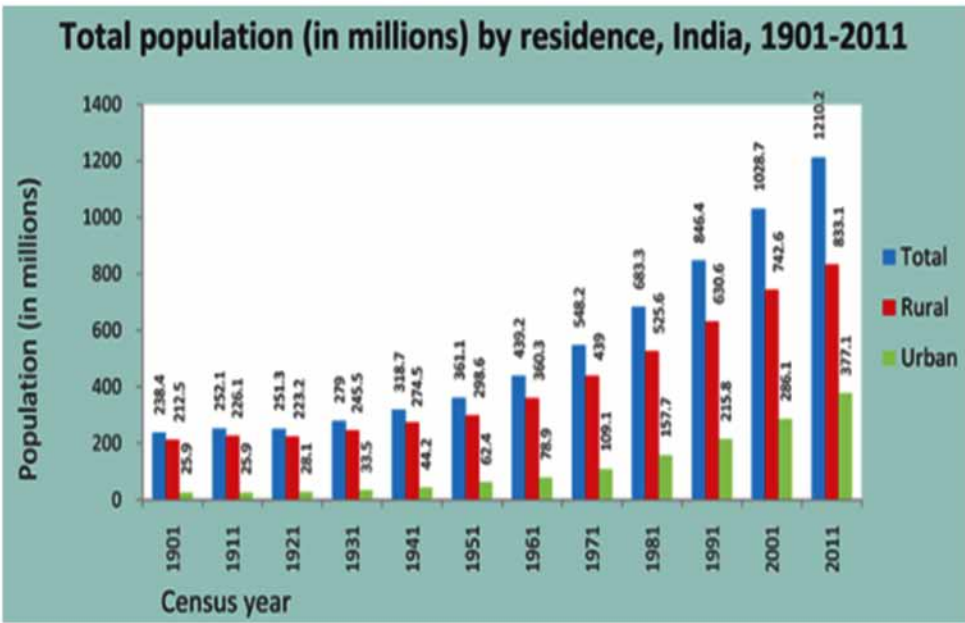
twice as likely to have a poorer health-related quality of life in comparison to people with no visual impairment (Crews, 2016). Vision impairment makes it more difficult to perform activities of daily living such as eating and dressing, as well as instrumental activities like shopping, driving, financial and medication management (National Academies of Sciences, 2016). It is important to treat any precursors to blindness, like cataracts and glaucoma, before it reaches an advanced stage.

A large subset of the Indian population resides in rural areas. 29% of the rural population is below India's official poverty line (Haub et al., 2010). The rural population of India stands at 833.1 million people in over 600,000 villages across the country, while the urban population stands at 377.1 million people (Chandramouli, 2011). Figure 1 illustrates the contrast between India's rural and urban populations from 1901 to 2011.

The financial burden due to blindness is also impactful and has the potential to leave individuals and their families in poor conditions. There is a certain level of dependency that comes with being blind. Blind individuals may not be as independent as they were before and may require additional help from family members or medical personnel. This may greatly impact the income- generating power of the entire family. A cost-of-illness study was performed that indicated that financial burden mainly resulted from indirect costs like deductibles, productivity loss, early retirement, and informal support/ care for relatives (Chuvarayan et al. 2019). A combination of informal support, medical devices, and loss of productivity accounted for 80% of blindness related costs in the study (Chuvarayan et al. 2019).

India has been described as a country of mass poverty (Mahapatra, 2021). The number of poor people with an income of \$2 or less per day has increased by 75 million in a year due to the COVID-19 pandemic (Kochhar, 2021). Due to the constant demand to maintain their upkeep, people living in rural areas cannot afford to take a single day off work to receive medical care. This would reduce their income significantly and make them unable to support their family. Hospitals that provide quality services are too far away, with many rural residents having to travel more than 100km to reach their closest hospital (Singh, 2014). Transportation to and from these hospitals can be costly, while check-

Figure 1. India's rural and urban total population from 1901-2011 (Source: [https://censusindia.gov.in/2011-prov-results/paper2/data\\_files/india/paper2\\_1.pdf](https://censusindia.gov.in/2011-prov-results/paper2/data_files/india/paper2_1.pdf))



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