



Epidemiological Research Projects:

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Andhra Pradesh Eye Disease Study

One of the largest epidemiological studies in the developing world, APEDS was launched in 1996 to understand the burden of vision loss and its risk factors.

Dubbed one of the studies with robust and comprehensive studies ever done in India, the results from this study had some far-reaching consequences for eye health in India and the rest of the world. The much-accomplished and replicated LVPEI pyramidal model of eye care service is based on the results of this landmark study. The Andhra Pradesh Eye Disease Study, popularly known as APEDS has three phases:

- APEDS I: 1996 to 2000: Population-based cross-sectional study to assess prevalence and causes of visual impairment

- APEDS II: 2009 – 2010: A study to trace the original cohort of APEDS I and assess the mortality and migration trends.
- APEDS III: 2012 – 2016: A study to assess incidence (among non-cases) and progression (among cases) of blinding eye conditions among the surviving cohort of APEDS I participants.

Refractive Error Study in Children

Refractive Error Study in Children (RESC) surveys were designed to assess the age- and sex-specific prevalence of refractive error and related visual impairment in children of different ethnic origins and cultural settings, using consistent definitions and methods and thereby providing directly comparable data from entirely different parts of the world. Mahabubnagar district in Telangana was one of the two sites for RESC studies in India. This study aimed to assess the prevalence of refractive error and related visual impairment in school-aged children in the rural population of the Mahabubnagar district in the southern Indian state of Andhra Pradesh.

Rapid Assessment Studies

Rapid Assessment Methods are quick and low-cost epidemiological study methods that can generate information, which can be used to plan health policies and programs, as well as to deliver and improve services. LVPEI spearheaded the development of two new rapid assessment study methods, *Rapid Assessment of Refractive Errors (RARE)* and *Rapid Assessment of Visual Impairment (RAVI)*. These methods are being used in several regions in developing countries. In total, 20 rapid assessment studies were conducted to date.

LVPEI-Glaucoma Epidemiology and Molecular Genomic Study (LVPEI-GLEAMS)

In the developing world, more than 90% of glaucoma is undetected due to the lack of appropriate screening methods. The L V Prasad Eye Institute - Glaucoma Epidemiology and Molecular Genetic Study (LVPEI-GLEAMS) is a population-based study that aimed to estimate the prevalence of, along with clinical, systemic, and genetic risk factors for glaucoma in a rural population sampled from the state of Andhra Pradesh, India. The study also aimed to develop community screening strategies to diagnose glaucoma.

Barriers to uptake of referral services within L V Prasad's ICARE Pyramid: Khammam (2014), Mahabubnagar (2018)

Poor access to healthcare is a global issue that disproportionately affects resource-poor countries and correlates with poor health outcomes. Approximately 60%–70% of those who are referred to higher levels of care comply with their referrals. However, it is not known which factors are responsible for the uptake of services or why some patients comply with referral services and others do not. Hence, this study was carried out to look at the referrals from one SC to TCs. Our objectives are;

- To identify barriers to the uptake of referral services from this SC to TCs.

- To understand the characteristic differences between those who were compliant with referral services and those who were non-compliant, and
- To examine the associated factors for non-compliance with referral services.

Prevalence, Causes and Risk Factors for Blindness and Low Vision in Children in Krishna District of Andhra Pradesh, India: Initiative for Screening Children for Refractive Errors and Other Eye Health Needs (I-SCREEN)

The study aimed to provide estimates of the prevalence, causes, and risk factors for childhood-related diseases in the Krishna District of Andhra Pradesh, India.

The secondary objectives were;

- To assess the Knowledge, Attitude, and Practices (KAP) of parents for the uptake of eye care services in children
- To understand barriers to accessing eye care services including low vision and rehabilitation services and
- To assess compliance with spectacles use in children

Can using the BOOST (Better Operative Outcomes Software Tool) app improve Cataract Surgical Outcomes? A Prospective Study

Cataract BOOST (Better Operative Outcomes Software Tool) is a simple, free, and easy-to-use app to help surgeons monitor and improve cataract surgical outcomes. BOOST enables surgeons to record results the day after cataract surgery, then analyze and benchmark their results against other users around the world. It also suggests strategies to improve surgical quality where results are poor.

The Cataract BOOST prospective study aims to demonstrate whether using the BOOST app can improve the proportion of cataract surgeries with good outcomes (uncorrected VA \geq 6/18) and be effectively integrated into routine surgical care.

Endophthalmitis Prophylaxis Study: intracameral cefuroxime and moxifloxacin prophylaxis for prevention of post-cataract Endophthalmitis in rural India

Intracameral antibiotics are known to reduce the rate of Endophthalmitis. This study is about the reduction in the rate of acute Endophthalmitis following the use of intracameral antibiotics. The second arm of this study is about no use of postoperative topical antibiotics with the use of routine intracameral antibiotics.

Impact of intervention for avoidable visual impairment among the Elderly Population in Residential Care in and around Hyderabad, India –The Hyderabad Ocular Morbidity in Elderly Study (HOMES) (2017-2020)

Funded by the Wellcome Trust India Alliance

Vision loss adversely impacts the quality of life of the elderly population. Previous studies have found that vision loss is more common in residential care. There is very limited research done in this area in India. India is aging and the number of homes is on the rise. The HOMES project was initiated to understand the prevalence and causes of vision loss among the elderly in residential care in Hyderabad in Telangana. A large burden of distance and near vision

impairment was found. A significant improvement in visual function on providing interventions such as spectacles and cataract surgery was noted. To date, 14 peer-reviewed papers are published from this study.

Vision in Occupational Groups Eye Study (VOGES) (2019-2023)

Funded by Lions Clubs International Sight First Research Grant

The Vision in Occupational Groups Study was initiated to understand the prevalence of distance and near vision impairment, ocular morbidity, and binocular anomalies in individuals involved in intensive near work. Another objective of this study was to assess the impact of spectacles on work productivity in these occupational groups.

Three occupations, garment makers, cloth weavers, and jewelry makers were selected for this study. The data collection for the study is completed and data analysis is being carried out. In total, 3,172 people were examined as a part of this project.

The Nirmal Eye Evaluation for Trends (NEET) (2021-2022)

Funded by the Wellcome Trust India Alliance

The Nirmal Eye Evaluation for Trends (NEET) was carried out in the Nirmal district in Telangana, India to determine the prevalence, causes, and risk factors associated with visual impairment (VI) using extended *Rapid Assessment of Visual Impairment (RAVI)* methodology. The secondary objective of this study is to assess the temporal trends in the prevalence of visual impairment in the region compared to previous studies.

As a part of this project, 5400 participants aged ≥ 16 years were enumerated from 90 randomly selected clusters of which 4629 (85.9%) were examined. The prevalence of VI (presenting visual acuity worse than 6/12 in the better eye) was 8.81% (95% CI: 8.01-9.67). Overall, uncorrected refractive error (49.5%) was the leading cause of VI followed by cataracts (40.2%) and posterior segment diseases (4.9%). Among those aged 40 years and older, the prevalence of VI declined by 20% compared to a previous study conducted in 2014. Further analysis is being carried out.

The ocular surface health status and the prevalence of dry eye disease among residents of mining communities: Environmental Eye Study (EES)

Harsh working environments such as prolonged mining activities can result in inflammatory **Dry Eye Disease (DED)**. The prevalence of DED in such a distinctive population has never been reported in the past literature. Understanding the prevalence and severity of DED will help in formulating preventive guidelines and measures to improve occupational health. The purpose of this study is to determine the ocular surface characteristics, the prevalence of dry eye disease (DED), tear film inflammatory markers, and their clinical correlation among people residing in mining communities with varying levels of exposure to mining activity.

Tribal Odisha Eye Disease Study (TOES)-Phase 1

The tribal population of India constitutes 8.2% of the total population. It is larger than the

tribal population of any other country in the world. India is home to 461 tribal communities. The tribal population of Odisha at 9.59 million (As per 2011 census). It is the third-highest percentage of tribal people in India. The tribal community constitutes 22.85% of the Odisha population.

PVTG (Particularly Vulnerable Tribal Group)

PVTG is a particular section of the tribal community. These communities are primarily homogenous and small populations, relatively physically isolated, and do not have a written language. There are 75 PVTGs in India. 13 PVTGs live in 14 districts of Odisha. The total population is 138,125. Dongria tribal community is one of 13 PVTG communities residing in the Rayagada district in the southwest hills of Odisha. The estimated population is 11,085 (2011 census: 8870), and they live in 2050 dwellings. They speak Kui, average literacy is 4%, and endemic malaria is their biggest health hazard. The Dongria women make colorful cotton shawls.

Dongria PVTG Eye Health Study

The LVPEI, Bhubaneswar conducted the Dongria PVTG survey under the guidance of the Ministry of Tribal Affairs (MoTA), Government of India, along with OPELIP (*Odisha and PVTG Empowerment & Livelihood Improvement Program*) and SCSTRTI (*SC & ST Research Training Institute*), Government of Odisha between July 2021 and January 2022. It involved community-level screening by the trained Community Health Workers (CHWs) and referred people were examined at the Vision (Primary care) center by Vision Technicians (VTs) and the Rayagada-based community eye center (Secondary care) by optometrists and ophthalmologists. Four LVPEI fixed eye care facilities were used- three Vision centers located at Muniguda, Sikhapai, and Therubali, and one secondary eye center located at Rayagada. The complete care was at no cost to people.

Key findings

- 89% (n= 9872/11,085) of people who consented to screening were examined. The mean age was 25.5±18.8 years; 55% (n=5391) were female; 13.8% (n=1361) were under-five children, and 39% (n=3884) were 6 to 16 years. 86% (n=8515) were illiterate
- 12.4% (n=1224) were visually impaired, of which 9.9% had early moderate VI, and 2.5% had severe VI and blindness. Uncorrected refractive error was detected in 7.5% (n=744) and cataracts in 7.6% (n=754); among the adults, 41.5% (n=924/2227) had presbyopia.
- In children, 20% (n=790) had vitamin A deficiency, 17% (n=234) had global acute malnutrition, and 18% (n=244) were stunted for their age.
- Almost two-thirds (62%, n=6144) confirmed habitual intake of alcohol, and 4% (n=389) of adults had essential hypertension.
- Following the screening, 43.5% (n=837) of referred patients reported to the fixed centers, and 55% (134/243) of people advised underwent cataract surgery. Spectacles were dispensed to 1496 individuals.

This first population-based study of one large PVTG in Odisha has shown that there is significant health (malnutrition), eye health (cataract and uncorrected refractive error), and behavioural (alcohol use) issues in this community. What is valid for the Dongaria community

could be true for other PVTGs in Odisha. A proactive, universal screening protocol used in the current TOES-PVTG may help understand their problems and make required policy changes. Simple interventions like providing spectacle and cataract surgery are likely to ease their financial burden and improve their quality of life. We believe improved livelihood opportunities and economic independence would probably change their health-seeking behavior. A pyramidal system of eye care that combines the physical and functional elements of IPEC as practiced by several organizations in India and advocated by the World Health Organization is likely to bring better health and wellness to this marginalized community. The Government of Odisha should consider a systematic eye health survey of other PVTG communities and design a robust delivery model for good health and eye health.

Barriers to reaching secondary level eye care service centre, after being referred by primary eye care centres – A qualitative study at Kuchukulla Ramachandra Reddy Eye Centre, Thoodukurthy

The aim of the study is to address the barriers with patients who previously utilized ophthalmic services at primary levels (Vision centres) and later failed to follow through with referrals to more advanced facilities at a secondary-level eye care centre (SC). Accessing online medical records and the absence of barriers to studies between primary and secondary centres, serves as an appropriate site to conduct such an investigation.