KantiVelugu: A Visionary Approach to Comprehensive Eye Health in Public Health Policy

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Abstract

Background: Globally, over 285 million people are visually impaired, including 39 million who are blind and 246 million with low vision. India and China together account for nearly half of the world's blindness and visual impairment cases, largely due to uncorrected refractive errors. This highlights the need for large-scale efforts to make vision care services accessible, affordable, and acceptable for all. Recognizing this need, the Government of Telangana launched the "KantiVelugu" program a statewide initiative to screen eyes and provide vision care.

Aim: To offer universal eye health across a large Indian state.

Objective: To understand the scope, feasibility, and impact of the KantiVelugu program, particularly in Hyderabad district of Telangana.

Methodology: This study uses a quantitative research approach with a standardized survey and close-ended questions. Both primary and secondary data were collected, with the study sample based on official data from the Telangana Government.

Results: The program successfully reached both rural and urban areas in Telangana, screening 250 rural and 300 urban communities. About 40% of the screened population needed treatment. In Hyderabad, 90 wards were covered, and approximately 892,256 people were screened.

Conclusion: This statewide program has proven effective in reaching underserved populations with eye care that is accessible, acceptable, and affordable. The success in Hyderabad reflects the program's broader impact across the state.

Keywords: KantiVelugu, Refractive Errors, Blindness, Hyderabad, Vision

Introduction

Vision is essential for a fulfilling life, helping us stay alert, process our surroundings, and respond to situations quickly. While vision is universally recognized as important, many people do not take the necessary steps to protect their eye health. This lack of care has contributed to rising rates of blindness worldwide, much of which is due to uncorrected refractive errors. According to Pascolini and Mariotti in their study "Global Estimates of Visual Impairment," over 285 million people around the world have visual impairments, including 39 million who are blind and 246 million with low vision. India and China account for about half of the world's cases of blindness and visual impairment, largely because of

uncorrected refractive errors. A recent review published in 2019 estimated that 53% of people in India have at least a 0.50 D refractive error, with 27.7% having myopia and 22.9% hyperopia.

Given the rapid increase in vision issues, organized efforts are crucial to prevent eye ailments and protect people from preventable blindness. Recognizing this need, the Government of Telangana launched the "Telangana KantiVelugu" program on August 15, 2018. This statewide vision screening initiative aims to reduce the impact of uncorrected refractive errors across the state. This paper examines the effectiveness of the KantiVelugu program, with a specific focus on its implementation in Hyderabad. By documenting this initiative, the goal is to highlight the importance of such a life-changing program and to encourage similar efforts in other states. The following sections provide a detailed look at the program's processes and key outcomes.

Literature review

The KantiVelugu program in Telangana, India, aims to provide universal eye care services and eliminate avoidable blindness through comprehensive screening, free spectacles, and surgeries (K. C. Reddy et al., 2023). Similar initiatives have been implemented in other Indian states, such as Odisha's Sunetra program, which allocated significant funding for eye health coverage (Das & Pattanayak, 2018). These programs align with the World Health Organization's Global Action Plan for universal eye health (Das & Pattanayak, 2018). To address barriers in eye care access, innovative approaches like the LV Prasad Eye Institute's Vision Guardians model have been developed to improve community eye health (Marmamula et al., 2022). The multi-tier pyramidal model of eye care delivery, encompassing all levels from primary to advanced tertiary care, has demonstrated the feasibility of universal eye health coverage in neglected populations (Rao, 2015). These initiatives focus on providing equitable, comprehensive eye care services to reduce visual impairment and blindness in underserved communities.

Recent research highlights the importance of comprehensive eye health initiatives in public health policy. Ormsby (2019) developed a framework and checklist for strategic planning and evaluation of eye health programs, emphasizing a whole-systems approach. In India, Murthy et al. (2020) successfully integrated diabetic retinopathy screening into the public health system, demonstrating increased service utilization. Sahu et al. (2024) evaluated the RAAHI program, which provided eye care services to truck drivers, showcasing the effectiveness of targeted interventions for vulnerable populations. These studies underscore the need for systematic screening, capacity building, and awareness programs to address visual impairment. Additionally, Nambiar (2020) advocates for a One Health approach in India to tackle emerging health threats, including zoonotic diseases, emphasizing intersect oral coordination and integrated public health infrastructure. These findings collectively support the development of comprehensive eye health strategies within broader public health policies.

Research Methodology

To gain a thorough understanding of the KantiVelugu program in Hyderabad, this study provides a detailed overview of the statewide initiative. A quantitative research design was used to offer an objective perspective on the program. The study focuses on people in Hyderabad who benefited from KantiVelugu's eye care services. The target population was estimated based on official statistics of those who received vision care through KantiVelugu. Data was collected through a standardized survey with close-ended questions, conducted in two phases. The first phase looked at data from the overall KantiVelugu program in Telangana, while the second phase focused specifically on Hyderabad's data.

Official KantiVelugu program documents were used as secondary data, while survey responses served as the primary data. The quantitative approach strengthens the study's objectivity, reliability, and credibility. Additionally, this paper documents the program's protocol.

The Launch and Process of the KantiVelugu Program

Aiming to make Telangana free from preventable blindness, the state government launched the "KantiVelugu" program to provide eye screenings for everyone across the state. The program began on August 15, 2018, in Gajwel constituency, with a goal to screen 12,751 villages and reach approximately 3.5 crore people. To ensure the program's success, community leaders and officials were encouraged to participate and motivate residents to use the services.

To support this, district meetings were held with various leaders, including MLAs, municipal and corporation chairs, and other officials. The main objectives of the program are:

- Screening eyes and testing vision for all residents.
- Providing free treatment for vision issues and free eyeglasses.
- Offering surgeries and other treatments at no cost.
- Providing medicines for common eye conditions.
- Educating people on preventing serious eye diseases.

Results and Interpretations

The district-level implementation plan involved various preparatory activities to ensure the KantiVelugu program was carried out effectively. The program was carefully designed to reach beneficiaries across all segments of the population. To make the program successful, local community involvement was a key focus for the organizers. Camps were set up in solid structures like schools, community centers, and other government buildings. The camp schedule was widely advertised to inform people well in advance and encourage good turnout.

The program's preparatory activities were organized in phases:
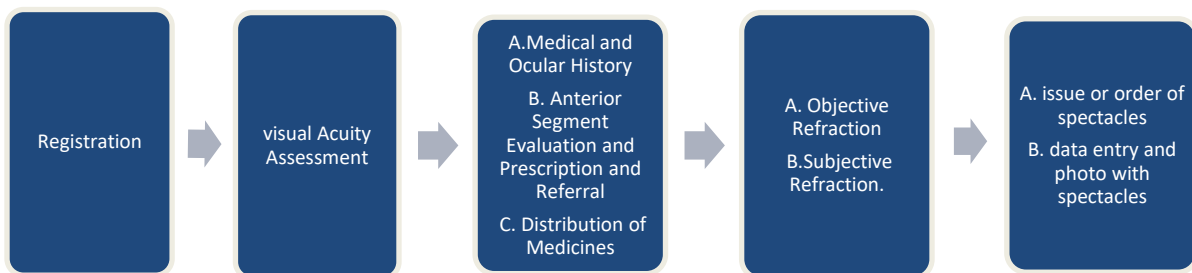
- In rural areas, camps were held at Primary Health Centers (PHCs), while in urban areas like the Greater Hyderabad Municipal Corporation (GHMC) zones, they were set up by wards. Each camp team included a Medical Officer, an Optometrist, and 6–8 support staff members (such as ANMs, Supervisors, and ASHAs), along with a vehicle to ensure timely visits.
- Each camp was expected to screen around 250 people in rural areas and 300 in urban areas, with approximately 40% needing treatment. Each district had a backup team of 4–6 medical officers and optometrists for emergencies. The organizing team scheduled and assigned Medical Officers and Optometrists to specific camps, with a detailed village-by-village camp schedule.
- The program included 940 medical officers, 1,000 optometrists, and approximately 8,000 support staff, forming a total of 799 teams. All staff members were trained, and at least one Medical Officer

was ensured at each PHC to prevent disruption of regular health services during the camp deployments.

Examinations and Services Provided at the Camps

The KantiVelugu camps offer the following eye examinations and services:

- A basic eye exam using the Snellen chart to check visual clarity, followed by detailed eye tests including objective and subjective refraction assessments. The entire screening process, from distributing glasses to scheduling follow-up surgeries, is managed through specialized software.
- Provision of medications and glasses for eye issues. Reading glasses for minor vision corrections are provided on the spot at the camp. Prescription glasses, which require customization, are delivered within 3–4 weeks.
- Referrals for additional treatment and surgeries at selected hospitals. Patients requiring further care or surgeries are referred to one of 114 participating government, private, or non-profit hospitals, where they receive free treatment. Priority institutions include 30 district hospitals, Sarojini Devi Eye Hospital in Hyderabad, and Regional Eye Hospital in Warangal.
- Each camp is equipped with essential tools and supplies, such as trial lens sets, auto-refractors, Snellen charts, glasses, mirrors, medicines, tablet PCs, tape, torches, and educational materials.
- District Collectors are encouraged to coordinate with other key departments for support at the district and mandal levels and are responsible for managing the program budget.
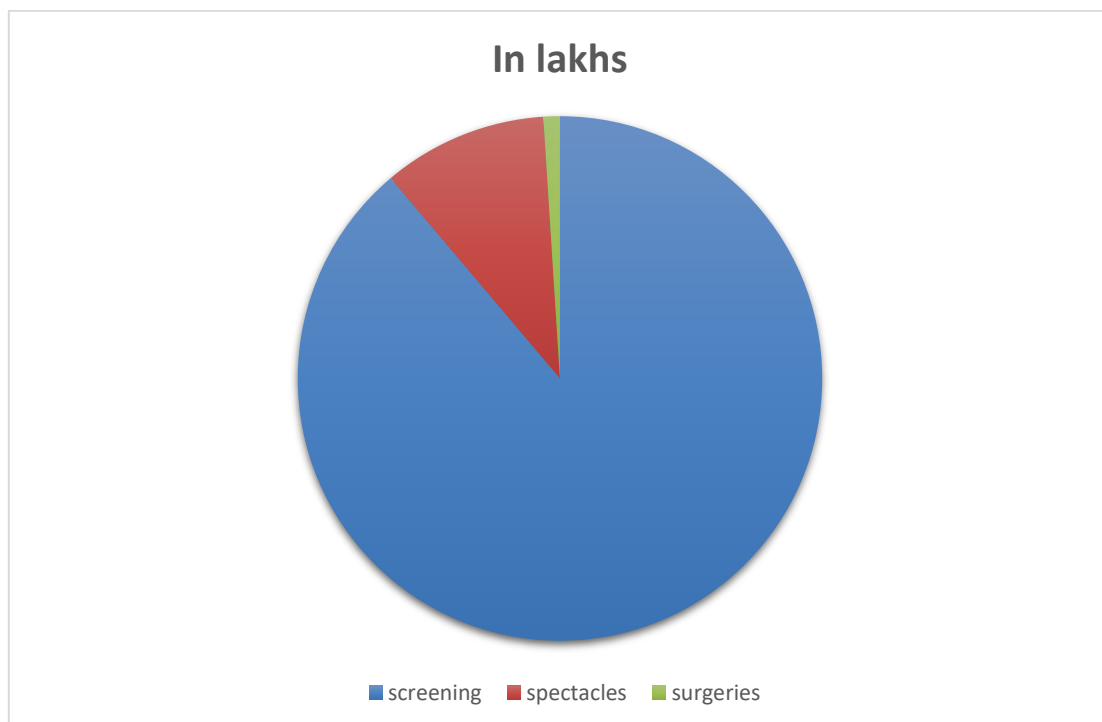

In lakhs

■ screening ■ spectacles ■ surgeries

Figure 1 illustrates the estimated reach of the KantiVelugu program in terms of population screened, glasses distributed, and surgeries performed. This large-scale vision screening initiative in Telangana covered 3.5 crore people, distributed 40 lakh pairs of spectacles, and conducted 4 lakh surgeries.
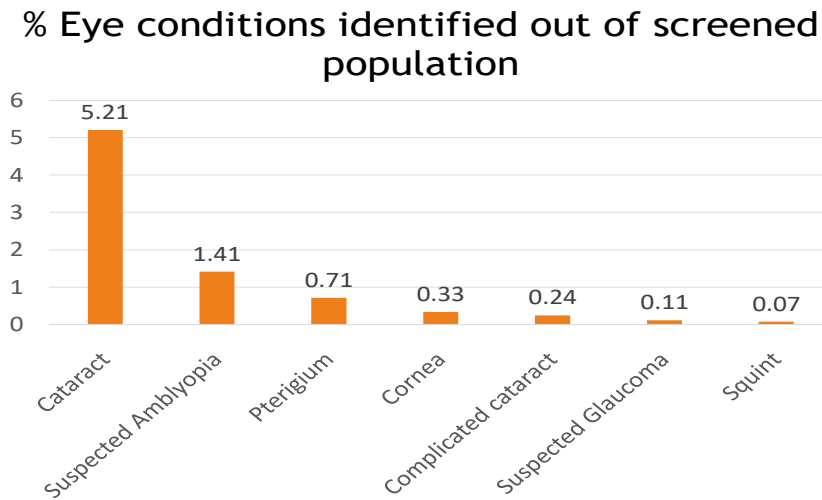
% Eye conditions identified out of screened population

Figure 2 shows the percentage breakdown of eye conditions detected in the KantiVelugu program's camps. Among the screened population, eye conditions ranged from 0% to 6%. Cataracts were the most common, affecting 5.21% of those screened. Other conditions included suspected amblyopia (1.41%), pterygium (0.71%), corneal disorders (0.33%), complicated cataract (0.24%), suspected glaucoma (0.11%), and squint (0.07%). Cataracts are especially prevalent in older adults with cloudy lenses, while squint, a misalignment of the eyes, was the least common condition.

**Results from the Hyderabad District KantiVelugu Program**

The success of the KantiVelugu program in Telangana is clearly reflected in its implementation in Hyderabad, the state capital, which received focused attention for the program's effective rollout. As of now, a total of 90 wards in Hyderabad have been covered under the scheme, with 892,256 individuals screened.
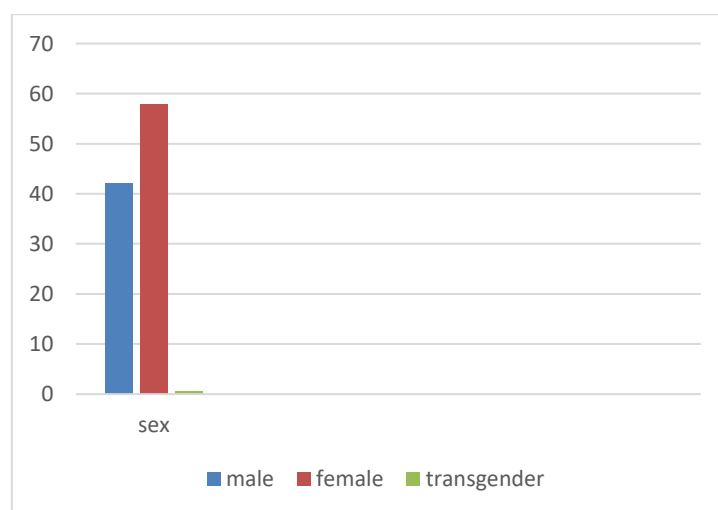
Figure 3: number of people screened in Hyderabad district

Even though , the scheme is inclusive enough to accommodate the transgender population under its frame, the participation of the community is very less when compared to the actual count of them

residing in hyderabad district. In hyderabad more females participants are benifitted in compare to male and transgender persons. The low level of participation by transgender community depicts the glass ceilings constructed for them which hinderes from availing the civil and political benefits organised by the authority. The total number of male screened under the scheme is 3,76,475 (42.19%), while female are 5,15,714 (57.8%) and transgender as 67 (0.01%).
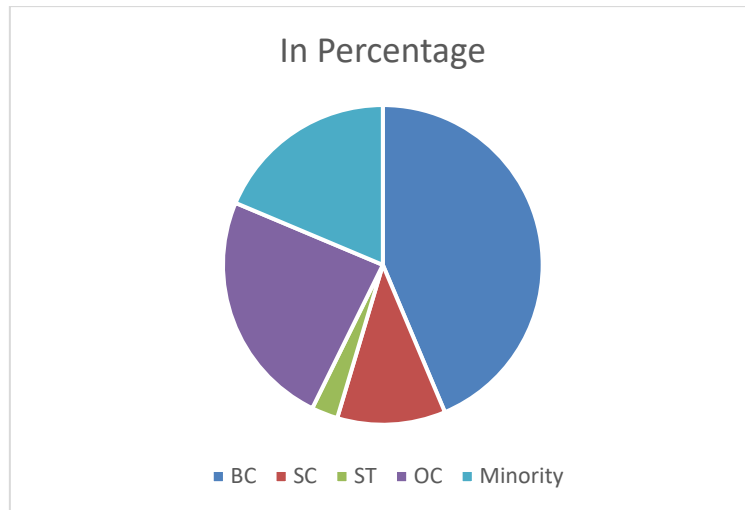
At first glance, the official statistical data shows a high level of inclusivity across various sections of society. The program ensured that it reached a diverse range of beneficiaries, reflecting the demographic mix of Hyderabad. The people screened included males, females, and transgender individuals, representing different social categories, such as Scheduled Castes (SC), Scheduled Tribes (ST), Backward Classes (BC), and Open Category communities. Additionally, the program also covered minority groups, ensuring that people from all backgrounds had access to the services.

Sl.No	Particulars	Cumulative
1	Number of Reading Glasses Handed Over	1,40,229
2	Identified for Prescription Spectacles	1,35,997
3	Identified for Referrals	62,714
4	Grand Total - People Given Service / Identified for Follow Up	3,38,940
5	People with no eye related issues.	5,53,316

Table 1: statistical data of services in Hyderabad district KantiVelugu program
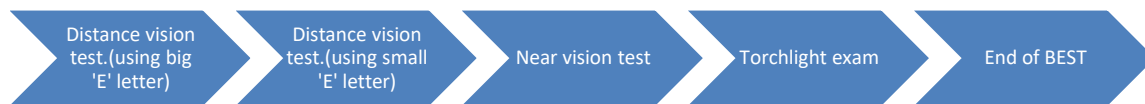
According to the Government of Telengana, in Hyderabad district, out of 1,40,229 people who underwent the screening and received followed benefit of reading glasses ,26,883of them belong to people below 40 years while the remaining 1,13,346 belong to people above the age of 40 years. This statistical data reiterate that eye problems is excaberating in people as far as they get older. Among the beneficiary count who has been identified for prescription spectacles, only 1,05,003 is delivered while the remaining 30,994 has yet to be delivered. The benificiaries identified for referrals is further categorized into secondary referrals estimating 30,067 and tertiary referrals estimating 32,647. As of now ,out of which 60,000 people were referred to other centers for further check-up and cataract surgeries.However, just 8,000 beneficiaries underwent free-of-cost surgeries.

This broad inclusiveness not only highlights the program's accessibility but also shows its commitment to serving underrepresented and marginalized communities. By reaching out to a wide range of individuals across various socio-economic categories, the program has proven to be equitable, ensuring that no group is left behind in receiving the essential eye care services. This approach has contributed significantly to the program's success in Hyderabad, as it fosters greater community trust and participation.

Discussion

The protocol used in the KantiVelugu program is called the 'Basic Eye Screening Test' (BEST), which was designed to empower community-based health workers, like ASHAs, to perform basic eye screenings directly at people's doorsteps. This approach is cost-effective, time-efficient, and helps to direct individuals to more specialized care when needed.

Distance vision test.(using big 'E' letter) → Distance vision test.(using small 'E' letter) → Near vision test → Torchlight exam → End of BEST

The BEST protocol is particularly effective in large-scale community screening programs, as it not only identifies common external eye conditions, such as pterygium and corneal scars, but also helps in assessing the extent of both near and distance vision impairment. The successful implementation of this protocol by ASHA workers played a key role in ensuring that the KantiVelugu program was systematic and reached as many people as possible.

While the KantiVelugu program is not the first eye screening initiative in India, it stands out due to its scale, the depth of its beneficiary reach, and its grassroots level implementation. Previous eye screening programs, like the International Agency for the Prevention of Blindness (IAPB)'s refractive error committee and India's National Program for Control of Blindness, aimed at reducing vision impairment caused by uncorrected refractive errors, particularly among children. Programs like these highlight the importance of addressing refractive errors, which can have devastating effects on children's learning abilities. Another notable example is the Netra Kumbh eye screening program, which was held during the 2019 Kumbh Mela and tested over 2 lakh people, providing glasses to over 1.5 lakh attendees. However, there are significant differences between Netra Kumbh and KantiVelugu in terms of scope, processes, and duration.

The Netra Kumbh program, which lasted 51 days, focused more on correcting ametropic errors (such as myopia and hyperopia) and provided immediate prescriptions for glasses. In contrast, KantiVelugu covered a six-month period and reached a far larger population, focusing more on presbyopia correction (age-related difficulty in reading). KantiVelugu has screened over 3.7 crore people across 12,751 villages, whereas Netra Kumbh's reach was limited to a much smaller group. Furthermore, KantiVelugu has a well-established referral system for follow-up care, unlike Netra Kumbh, which lacked a strong referral mechanism.

The success of the KantiVelugu program can be attributed to its broad reach and awareness campaigns, which engaged the public through both offline and online media. Active participation from local leaders and elected representatives further increased the program's visibility and helped build trust among

communities. This grassroots involvement was essential for ensuring that more people accessed the program's services, including eye screenings, glasses distribution, and surgical interventions.

While KantiVelugu has been a highly successful social welfare initiative aimed at tackling a major public health concern, the sustainability of its impact depends on its simplicity, adaptability, and ability to continue. The distribution of spectacles and surgical interventions has been one of the most appealing aspects of the program. A key element for success has been the coordination between ophthalmologists and optometrists, ensuring the correct prescription and timely delivery of glasses. The smooth coordination of medical staff, including the timely distribution of medicines and quick screenings, has helped ensure the program runs efficiently and meets its goals.

Conclusion

One of the primary causes of visual impairment and avoidable blindness in India is untreated refractive errors, especially among younger, productive individuals. Large-scale screening programs like KantiVelugu, which aim to reach economically disadvantaged and underserved populations, play a crucial role in preventing avoidable blindness. By identifying and correcting refractive errors early, these programs can significantly reduce the burden of visual impairment. This study of the KantiVelugu program in Telangana represents one of the first comprehensive data collections from such extensive eye screening camps in India, showcasing its potential as a model for other states and countries facing similar challenges in eye care. Through this initiative, Telangana has demonstrated a successful approach to tackling refractive errors and preventing avoidable blindness on a large scale.

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Conflict of interest

The authors declare no potential conflicts of interest in relation to the research, authorship and/or publication of this article.

Reference

1. Pascolini D, Mariotti S. Global estimates of visual impairment: 2010. British Journal of Ophthalmology. 2011;96(5):614-618.
2. Adeloye, D., Song, P., Zhu, Y., Campbell, H., Sheikh, A. and Rudan, I., 2022. Global, regional, and national prevalence of, and risk factors for, chronic obstructive pulmonary disease (COPD) in 2019: a systematic review and modelling analysis. *The Lancet Respiratory Medicine*, 10(5), pp.447-458.
3. Burney P, Jarvis D, Perez-Padilla R. The global burden of chronic respiratory disease in adults. The International Journal of Tuberculosis and Lung Disease. 2015;19(1):10-20.
4. Health and family welfare department and Commissioner of Health and family welfare, (n.d.). *National program for control of blindness Government of Telangana.* government of Telangana.
5. Honavar S. The burden of uncorrected refractive error. Indian Journal of Ophthalmology. 2019;67(5):577.
6. Naidoo K, Leasher J, Bourne R, Flaxman S, Jonas J, Keeffe J, Limburg H, Pesudovs K, Price H, White R, Wong T, Taylor H, Resnikoff S. Global Vision Impairment and Blindness Due to Uncorrected Refractive Error, 1990–2010. Optometry and Vision Science. 2016;93(3):227-234.

7. Sheeladevi S, Seelam B, Nukella P, Borah R, Ali R, Keay L. Prevalence of refractive errors, uncorrected refractive error, and presbyopia in adults in India: A systematic review. Indian Journal of Ophthalmology. 2019;67(5):583.

8. Dandona L, Dandona R, Srinivas M, Giridhar P, Vilas K, Prasad M. Blindness in the Indian state of Andhra Pradesh. Investigative Ophthalmology and Visual Science [Internet]. 2001 [cited 2022 Sep 10];42(5):908-916. Available from: https://iovs.arvojournals.org/article.aspx?articleid=2162530

9. Dandona R, Dandona L, Srinivas M, Giridhar P, Prasad MN, Vilas K. Moderate visual impairment in India: The Andhra Pradesh eye disease study. British Journal of Ophthalmology .2002;86:373-377.

10. Marmamula S, Khanna R, Kunuku E, Rao G. Near visual impairment and spectacle coverage in Telangana, India. Clinical & Experimental Ophthalmology. 2017;45(6):568-574.

11. Marmamula S. The Basic Eye Screening Test (BEST) for primary level eye screening by grassroot level workers in India. Indian Journal of Ophthalmology. 2020;68(2):408-409.

12. Reddy, K.C., Koutilya, K., & Naik, D.V. (2023). Telangana Kanti Velugu 2023: Universal Access for Eye Screening and Provision of Quality Spectacles for Millions - A Case Study in Effective Supply Chain Management, Operations, and Cost Effectiveness by TSMSIDC & CHFW, DoHMFW, Govt. of Telangana India. *International Journal of Science and Research (IJSR).*

13. Das, T., & Pattanayak, S. (2018). Universal eye health in Odisha, India, Sunetra. Report # 1. Program planning. *Clinical Ophthalmology (Auckland, N.Z.), 12*, 2199 - 2203.

14. Rao, G.N. (2020). Universal health care: Can Indian ophthalmologist community set an example? *Indian Journal of Ophthalmology, 68*, 281 - 284.

15. Marmamula, S., Varada, R., Williams, J., & Khanna, R.C. (2022). Vision guardians for community eye health: the LV Prasad Eye Institute model in India. *Community Eye Health, 35*, 24 - 26.

16. Ormsby, G.M. (2019). Formative research for the development of an Eye Health Strategic Planning and Evaluation Framework and a Checklist: A health systems approach. *The International journal of health planning and management, 34 2*, e1356-e1375 .

17. Murthy, G., Gilbert, C.E., Shukla, R., Bala, V.M., Anirudh, G., Mukpalkar, S., Yamarthi, P., Pendyala, S., Puppala, A., Supriya, E., & Batchu, T. (2020). Overview and project highlights of an initiative to integrate diabetic retinopathy screening and management in the public health system in India. *Indian Journal of Ophthalmology, 68*, S12 - S15.

18. Sahu, A.B., Tiwari, J., P. N., P., & Mohanty, R.N. (2024). Bridging vision gaps: a comprehensive study of the RAAHI programme for improving truckers' eye health in India. *International Journal Of Community Medicine And Public Health*.

19. Nambiar, P. (2020). India to envision One Health movement for confronting emerging health threats: From concept to approach toward institutionalization.