Seeing the Unseen: Economic Vulnerabilities and Visual Impairment among older adults in India

Background: Visual impairment (VI) and blindness impose a significant amount of health burden and this burden has expanded by 47% from 12 858 000 disability adjusted life years (DALYs) in 1990 to 18 837 000 DALYs in 2010 (Murray et al., 2012). Various efforts have been taken at global level to combat with this situation. India has also implemented various initiatives under National Programme for Control of Blindness & Visual Impairment (NPCBVI) in an effort to address this issue over the past decades and it has resulted in significant decline in the of prevalence of blindness from 1% in 2007 to 0.36% in 2019. Still, 29.2 million people are living with moderate or severe VI in India and the prevalence is higher among people aged 50 years and above (Ministry of Health and Family Welfare, 2019). Studies indicate that people with functional disabilities, including those have VI, are immensely affected by lower earnings, unemployment and at higher risk of poverty and financial dependency compared to non-disable people (Abou-Hanna et al., 2021; Iverson et al., 2025). The relationship between economic wellbeing and VI is multifaced and influenced by other factors, including educational attainment, employment opportunities and social supports. Social inequalities and discrimination also exacerbate economic insecurities, particularly in those countries where social policies related to disability is lacking. Therefore, addressing these issues in India is one significant aspects of public health concerns.

Objective: This paper aims to examine the relationship between economic wellbeing and visual impairment among older adults in India. By addressing this issue, this study contributes to the growing body of research on VI and its implication on economic outcomes.

Data and methods: The present study utilized the first wave of the Longitudinal Aging Study in India (LASI) which was conducted in 2017-2018. LASI covered a panel sample of 73,396 older adults aged 45 and above and their spouses, including 43,584 households and 31,902 older adults aged 60 and above from 36 states and union territories of India. The main outcome variable was index of economic well-being (IEWB), and it was assessed using a composite index compounded with index of monthly per capita consumption expenditure (IMPCE), index of monthly per capita income index (IMPCI) and index of wealth (WI).

Severity of VI was used as the key explanatory variables. Severity of VI was sought from LASI's individual level data. Health investigators assessed presenting visual acuity (PVA) which was field tested by the LASI team to ensure its reliability and comparability with the standard logMAR chart method. The Tumbling E logMAR chart was utilized for distance

vision, with the participant standing 3 meters away. The first screen corresponded to 20/125, 20/100, 20/80, or 20/63 acuity levels, adapted based on the participant's responses. If the respondent correctly identified 3 out of 5 letters, the computer would adjust to display smaller or larger letters accordingly. The near vision test followed a similar process, with participants positioned 40 cm from the screen. Both tests were conducted with precautions to minimize glare. Then VI was categorized according to WHO definitions, VI severity based on best correction available on both eyes: no VI (≥20/40), mild VI (<20/40–20/60), moderate VI (<20/60–20/200), and severe VI or blindness (>20/200). Individual and household-level characteristics of the study population were considered as covariates.

Descriptive statistics and bivariate analysis were conducted to understand the characteristics of the study population. Further, ordinary least squares (OLS) regression was applied to understand the association of severity of VI and different parameters of economic well-being. Four models of regression were built and the models considered IMPCE, IMPCI, WI and IEWB as outcome variables, respectively.

Results: The prevalence for moderate distance, near and any VI among older adults were 23.7%, 46.3% and 50.3%, respectively. Around 2.5% older adults had severe distance VI and 6.5% older adults had severe near VI. Overall, the prevalence for severe or blindness was 7.6% (**Figure 1**).

The findings indicated a consistent decline in economic well-being with increasing VI severity and those experienced severe VI or blindness had the lowest scores across all indices—MPCE, MPCI, IW and IEWB. Individuals with no VI had the highest economic well-being, while those with mild and moderate VI showed a gradual decline, and those with severe VI or blindness experienced the highest economic disadvantage. The IMPCE dropped from 40.18 (no VI) to 36.85 (severe VI/blindness) for any VI, while the IMPCI declined from 72.75 (no VI) to 63.11 (severe VI/blindness) for the same category. Similarly, the IW decreased from 46.2 to 37.93, and the IEWB declined from 52.95 to 45.91 for any VI, reinforcing the economic vulnerability of the severely visually impaired. Further, it can be observed that distance VI appeared to have a stronger negative impact than near VI, with individuals in the severe VI/blindness category were having slightly better economic well-being scores for near VI (46.23) compared to distance VI (44.71), possibly due to greater mobility restrictions and employment limitations in distance VI cases (**Table 1**).

In fully adjusted regression for combined economic wellbeing, VI was significantly associated with lower composite economic wellbeing scores, with more severe impairment linked to

increasing negative impacts. For instance, those with moderate VI (Coeff: -1.793; p<0.001, CI: -2.18, -1.41) and severe VI (Coef: -2.305; p<0.001, CI: -2.83, -1.78) were negatively associated with having better composite economic wellbeing scores compared to those with VI. Rural residents experienced higher economic wellbeing (Coef: 3.83; p<0.001, CI: 3.58, 4.07) compared to their urban residents (**Table 2**).

Conclusion: In conclusion, the study findings emphasized the economic vulnerabilities experienced by older adults with visual impairment and highlight the target intervention in education and employment opportunities and social protection through life course perspective. The insight gained from the current research highlights to enhance accessibility of quality education and improving disability support programmes to nurture economic resilience among visually impaired older people. Further, addressing VI through enhanced public awareness of preventive care, early diagnosis, improved access to treatment, and the adoption of new medical technologies could greatly improve the quality of life for those affected and their families. Such measures could also potentially lower national healthcare expenditures and boost productivity. By prioritising these interventions, India could mitigate the socio-economic impact of VI and support the economic well-being of the ageing population.

References:

1. Abou-Hanna, J. J., Leggett, A. N., Andrews, C. A., & Ehrlich, J. R. (2021). Vision impairment and depression among older adults in low-and middle-income countries. *International journal of geriatric psychiatry*, *36*(1), 64-75.
2. International Institute for Population Sciences [IIPS], National Programme for Health Care of Elderly,Ministry of Health and Family Welfare, Harvard T. H. Chan School of Public Health, and the Uni-versity of Southern California. (2020). Longitudinal ageing study in India, wave 1, 2017–18, Indiareport. Mumbai: International Institute for Population Sciences. https://www.iipsindia.ac.in/sites/default/files/LASI_India_Report_2020_compressed.pdf.
3. Iverson, E., Sukhai, M., Quinn, M. P., Aubin, M. J., & Freeman, E. E. (2025). Visual impairment, employment status, and reduction in income: the Canadian Longitudinal Study on Aging. *Canadian Journal of Ophthalmology*, *60*(1), e16-e22.
4. Ministry of Health and Family Welfare. (2019). *National Blindness & Visual Impairment Survey of India 2015-2019 Report*. Government of India. https://npcbvi.mohfw.gov.in/writeReadData/mainlinkFile/File341.pdf.
5. Murray, C. J., Vos, T., Lozano, R., Naghavi, M., Flaxman, A. D., Michaud, C., ... & Haring, D. (2012). Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *The lancet*, *380*(9859), 2197-2223.