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## Public health control strategies for glaucoma and vision

Yogita Prabhakar Kadam<sup>1</sup>

<sup>1</sup>Department of eyeSmart EMR, IHOPE, L.V. Prasad Eye Institute, GPR ICARE, Hyderabad, Telanagana, India.



**\*Corresponding author:**

Yogita Prabhakar Kadam,  
Clinical Optometrist, Research  
Associate, Department of  
eyeSmart EMR, IHOPE,  
L.V. Prasad Eye Institute,  
GPR ICARE, Hyderabad,  
Telanagana, India.

yogita.kadam@lvpei.org

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Glaucoma is the leading irreversible cause of blindness globally, affecting 64.3 million people.<sup>[1]</sup> Although glaucoma can progress to blindness, it is generally asymptomatic in its early stages, when treatment is most effective. This makes early detection crucial to reduce the risks of visual impairment. The number of people suffering from glaucoma is steadily increasing in Asia and Africa.<sup>[2]</sup> Screening for the early detection of the disease is very much needed to increase awareness of the disease. The risk to patients who are not screened for glaucoma is more. It has been shown that it is cost-effective to screen for glaucoma in low- to middle-income countries; it also saves physician time and scanty costs in peri-urban and rural areas. Hence, there was a need to develop new models to screen for glaucoma in low-resource settings.<sup>[2]</sup> The study aimed to develop and test an online course to train a non-ophthalmic grader to screen for glaucoma during an ORBIS diabetic retinopathy screening project in Vietnam.<sup>[3]</sup> Poor vision affects around 2.2 billion people worldwide. A new research project, eyecare nurtures good health, innovation, driving safety, and education (ENGINE), was launched to explore vision care as a driver of development across the course of life.

The first phase consisted of capitalizing on the leverage of the existing DR graders and seeing if they can be trained to recognize glaucoma and its screening compared to the local ophthalmologist. It was an uncontrolled, interventional, and experimental before and after study, wherein 43 non-ophthalmic DR image graders were trained to screen for glaucoma using optic nerve photos. The 6-h online self-phased course consisted of three modules translated from English to Vietnamese. Optic nerve photos from the ongoing Orbis Café DR (NICOLA) screening program and the standard Glaucomatous Optic Neuropathy Evaluation set of images were used and characterized as easy, medium, and difficult.<sup>[4]</sup> The test comprised 60 normal and glaucomatous optic disk images. The performance was compared with local ophthalmologists who did not attend the course. The study showed a significant improvement in the non-ophthalmic graders after the training with no significant difference between the ophthalmologist and the non-ophthalmic graders.

Furthermore, additional training for the non-ophthalmic graders did not improve their performance further. Furthermore, the Sidra foundation has also funded to carry out a study in Eswatini, South Africa to assess this training module as a part of a full primary care-based glaucoma screening module to see the accuracy of the screeners, trained using this course, to identify glaucoma in occupational health clinics, and also to increase the follow-up rates of referred patients and the cost incurred per true case identified.

ENGINE trial comprises a four-country (Bangladesh, Vietnam, India, and Zimbabwe) suite of massive trials examining the impact of glasses on promoting better living from childhood through old age by looking at different aspects of vision-related impact on their daily life.<sup>[3]</sup> This

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trial consists of 29 collaborating institutes from six countries where the government is involved and IHOPE is a part of the project. It is led by Prof. Nathan Congdon of Queens University Belfast in the UK and Prof Rohit Khanna of L.V.Prasad Eye Institute in India.<sup>[3]</sup> The four research projects of ENGINE trials are.

1. Slashing two-wheeled Accidents by Leveraging Eyecare to improve motorcycle safety and to avoid crashes in the young by combating Vietnam's twin epidemics of uncorrected short-sightedness
2. Zimbabwe Eyecare Learning for better learning opportunities for children by helping long-sighted children with novel low costing screening which can help to have a great impact on their academics
3. Cognitive Level Enhancement through vision Examinations and Refraction for slowing cognitive decline by finding scalable, low-cost means of preventing dementia in India
4. Transforming households with refraction and innovative financial technology for promoting mobile banking by providing free glasses to the elderly and training them to use unfamiliar smartphones, thus improving financial independence.

Meta-analysis of prevalence studies indicated that 49% of people with primary angle closure glaucoma (PACG) in rural areas and 74% in urban areas had been previously diagnosed and treated, compared with only 7% and 10% of people with POAG.<sup>[5]</sup> The percentage of people diagnosed with PACG opportunistically with no symptoms was zero in urban and rural areas. Compliance with referral to the base hospital for further testing among patients informed they had signs of glaucoma was assumed to be 19% and 57% among rural 16 and urban six residents, respectively.<sup>[5]</sup> The study aimed to create cost-effective models for the early detection and screening of glaucoma in low-middle-income countries. The non-ophthalmic graders were trained to identify glaucomatous optic nerve images and have shown significant improvement in diagnosing the same and no difference in comparison with ophthalmologists.

Traffic injuries are the leading cause of death globally in young ones and young adults aged 5–29 years.<sup>[3]</sup> The World Bank and Bangladesh's novel strategy of delivering net banking options for elderly people will be helpful for many other countries if visual challenges for the users are met successfully.<sup>[3]</sup> Since the invention of glasses 700 years ago, poor vision has been the, most significant unaddressed disability in the world, and it is getting worse. We will never be able to complete sustainable development goals unless this hurdle is faced.

The ENGINE trial program represents a watershed moment in proving the importance of addressing vision correction

throughout the life course and development agenda by examining how affordable, effective, and widely available treatment glasses can help achieve the same. The agendas addressed here are trying to reduce road traffic injuries by enhancing learning among millions of African children with long-sightedness, also called Hyperopia, which is present at higher rates in Africa than in any other global region, and by slowing the onset of cognitive decline and dementia among elderly people struggling with poor vision working on preventive strategies for cognitive decline. Furthermore, helping older people use online net banking will help improve their economic independence. All these are done by providing them with glasses correcting their vision and increasing their visual performance, and helping them with their productivity.

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### Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Nil.

### Conflicts of interest

There are no conflicts of interest.

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