

## Is population-based glaucoma screening cost-effective in China?



In high-income countries, population screening for glaucoma is not considered to be a cost-effective intervention.<sup>1,3</sup> However, in *The Lancet Global Health*, Jianjun Tang and colleagues show in their economic evaluation of population-based screening for both primary angle-closure glaucoma (PACG) and primary open-angle glaucoma (POAG) that such a strategy is likely to be cost-effective in China.<sup>4</sup> The authors further report that in urban China, the combined PACG and POAG screening would dominate over the no intervention scenario—that is, money saved from having to provide less glaucoma treatment exceeds the actual investment cost of glaucoma screening. In rural China, the incremental cost-effectiveness ratio is US\$1280 (95% CI –58 to 7940) for each quality-adjusted life-year gained and remains well below the estimated per-capita GDP in rural China (\$4010). The authors credit these results to the relatively high glaucoma incidence and low cost of screening in China.

The analysis, however, represents an optimistic evaluation of the cost-effectiveness of population-based screening of glaucoma in China, and whether its feasibility as a national intervention in other settings where the cost structure—particularly the cost of human resources—is substantially different remains a matter of further investigation.

Population screening of glaucoma needs to be a state-sponsored programme. It is unlikely that local communities would spontaneously participate and achieve a high screening coverage without the stimulation and support from governmental health institutes. On the other hand, active community screening projects such as the Wenzhou Glaucoma Screening Program<sup>5</sup> require substantial organisational and logistical efforts and might not be replicable across the country.

In the current Chinese context, a feasible and sustainable way to fund an ongoing population screening programme for glaucoma could be through its national health insurance system. Despite its split operation in rural and urban China and its large geographical variations, the national health insurance system has managed to cover more than 95% of the Chinese population.<sup>6</sup> Including glaucoma screening as a

part of the routine annual check-up and allowing it to be reimbursable through the health insurance scheme will certainly improve the accessibility and sustainability of the programme.

Although the screening cost for glaucoma is notably low in Tang and colleagues' estimation (\$2.52 for PACG and \$3.20 for POAG per screening),<sup>4</sup> provision of screening to 400 million people older than 50 years of age remains a logistical and financial challenge. A further budget impact analysis of the intervention would help to clarify its implications to the national health budget.

The implementation of a nationwide glaucoma screening programme requires the country to address the substantial inequality in health-care accessibility across urban and rural China.<sup>7</sup> As Tang and colleagues' report, the provision of screening in urban China is far more cost-effective than that in rural areas.<sup>4</sup> This result probably only reflects better accessibility due to the greater availability of health-care infrastructure and networks in urban China. Inequality in accessing health care is substantial between urban and rural China, with most health resources concentrated in urban areas.<sup>8</sup> As a result, rural residents are often required to seek health care in urban areas, which inevitably increases the demand for care in urban China. To cope with the demand, further health resources are poured into urban areas, leading to a vicious cycle that continues to widen the inequality gap. Further economic evaluation should aim to identify the most economical solution to reduce the disease burden of glaucoma and at the same time limit the widening of inequality in accessing eye care.

In high-income countries with predominantly white populations, PACG prevalence is very low and population screening often focuses on POAG alone. By contrast with the existing body of evidence that does not support population screening for POAG in such countries, this study's evaluation of combined screening for both POAG and PACG shows good population impact and cost-effectiveness in a developing country setting. This research highlights the importance of taking into consideration the socioeconomic and demographic differences while implementing national programmes in various economic settings and emphasises

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that the solution is often not universal. Tang and colleagues have identified an important knowledge bias in the understanding of health economics of glaucoma intervention. If proven feasible, the study's recommendations could substantially change the current clinical practices for glaucoma screening in China, and perhaps in other resource-limited settings, and achieve a large gain in its population health.

Conclusively, the key take-home message from this Tang and colleagues' Article is simple. High disease incidence, low screening cost, and the advantage of combined POAG and PACG screening are all key determining factors of cost-effectiveness of a population glaucoma screening programme. The implementation of such a programme in reality requires strong leadership and sponsorship from the state.

Lei Zhang, \*Mingguang He

Department of Epidemiology and Biostatistics, School of Public Health, Xi'an Jiaotong University Health Science Center, Xi'an, Shaanxi, China (LZ); Centre for Eye Research Australia, Ophthalmology, Department of Surgery, University of Melbourne, Melbourne, VIC 3002, Australia (LZ, MH); and State Key Laboratory of Ophthalmology, Zhongshan Ophthalmic Center, Sun Yat-sen University, Guangzhou, China (MH)  
mingguang.he@unimelb.edu.au

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