

Thematic Brief: Technology Accelerating Global Eye Health

Key Messages

- **Technology as an Economic Multiplier:** Investing in eye health technology is a powerful economic enabler. By improving access to services in LMICs we see a 1:28 return.
- **Enabling Scale and Access:** Technological solutions are essential to improve access to services, boost productivity, and improve patient outcomes.
- **Partnerships are Key:** Success requires facilitating partnerships between governments, technology providers, and funders to create a scalable, enduring ecosystem.
- **Long-term Efficiency:** Technology enables sustainability by optimizing resource use, creating strong ecosystems, enabling long-term operational efficiency.

Why This Matters

Technology acts as a bridge to reach underserved populations, particularly where the eye care workforce is limited. Advances in technology have improved screening, diagnosis, and treatment. Yet **access to this technology remains uneven**. Enabling environments are vital to de-risk the adoption of technology, creating the stable conditions needed to fully integrate into health systems that optimize resource use and drive long-term economic returns.

The Problem

- **Workforce Shortages:** A critical lack of the eye care workforce in low- and middle-income countries, and rural and remote communities creates significant barriers to care. Technologies can offer a scalable solution to bridge the gaps in workforce, optimise the use of trained eye care personnel and service these populations that would otherwise remain cut off from essential refraction, and eye health services.

- **Screening and Identification Gaps:** There is insufficient community-based screening and a lack of system integration for data, referrals and follow up care. Current regulatory frameworks often fail to accommodate new technologies, preventing the "task-shifting" needed for community health workers to use diagnostic tools.
- **Digital Equity and Access Barriers:** If digital technology and its implementation is not designed for low-resource settings, it risks exacerbating existing inequities. High costs, geographic isolation, limited digital literacy and inconsistent standards further limit the reach of digital solutions.
- **Barriers to Scale:** A significant funding gap exists between early research, product development and the national-scale roll-out of technology. Many health systems lack the catalytic funding needed to de-risk technology adoption and build the necessary infrastructure and ecosystem to ensure lasting integration of technologies.

What Works

- **Mobile Screening Apps:** Deploy validated smartphone applications to allow non-clinical workers to conduct rapid, high-volume vision checks.
- **Portable Diagnostics:** Equip mid-level personnel with handheld autorefractors to provide precise, on-the-spot refraction.
- **Telehealth:** Implement platforms that connect community health workers with remote optometrists for real-time tele-refraction and specialist consultations.
- **AI Imaging Diagnosis:** Use Artificial Intelligence to support automated diagnostics and clinical decision-making, enabling specialised eye care to scale efficiently.
- **Integrated Data Platforms:** Utilise digital pathways to track the patient journey from screening to surgery, ensuring robust data for national service planning.
- **Digital Training Tools:** Adopt VR/AR simulation software to fast-track surgical training and build a highly skilled eye health workforce.
- **Local and Digital Supply Chains:** Leverage digital inventory systems and local assembly kits to slash the cost of glasses and improve delivery speed.

Recommended Actions

- **Integrate Tech into National Policies:** Commit to integrating validated screening, diagnosis and treatment technologies into national eye care programs and tech policies
- **Create Enabling Regulatory Environment:** Update regulations to allow trained community health workers and refractive teams to use technology for screening and refraction.
- **Establish National Data Standards:** Work with international bodies to establish data standards, ensuring tools connect with national health systems and use open data standards and AI.

Expected Impact

- **Improved Patient Journeys:** Automated tracking and referral pathways through integrated data platforms.
- **Workforce efficiency:** Technology enables task-shifting and addresses workforce shortages
- **Equity outcomes:** Technology can reduce urban-rural disparities when properly deployed
- **Economic Growth:** High returns on investment for low- and middle-income countries from delivering eye care services.

Conclusion

Investing in eye health technology is a powerful economic enabler and a fundamental tool for achieving massive scale in eye care. By bridging the gap between pilot projects and national-scale roll-outs **through catalytic investment and coordinated policy**, governments can create a sustainable ecosystem that ensures quality eye care is accessible to all.

References:

1. Angrist, N., Aurino, E., Patrinos, H. A., & Rogers, F. H. (2023). Improving learning in low- and lower-middle-income countries. *Journal of Benefit-Cost Analysis*, 14(S1), 55–80.
<https://doi.org/10.1017/bca.2023.26>

2. Burton, M. J., Ramke, J., Marques, A. P., Bourne, R. R. A., Congdon, N., Jones, I., Ah Tong, B. A. M., Arunga, S., Bachani, D., Bascaran, C., Bastawrous, A., Blanchet, K., Braithwaite, T., Buchan, J. C., Butcher, R., Chang, C. K., Chodosh, J., Crofts-Lawrence, J., Dean, W. H., . . . Faal, H. B. (2021). The Lancet Global Health Commission on Global Eye Health: Vision beyond 2020. *The Lancet Global Health*, 9(4), e489–e551. [https://doi.org/10.1016/S2214-109X\(20\)30488-5](https://doi.org/10.1016/S2214-109X(20)30488-5)
3. Kapur, N., Sabherwal, S., Sharma, P., & Sil, A. (2024). Assessing the reliability of tele-refraction for real time consultation with a remote optometrist. *PLoS One*, 19(6), e0299491. <https://doi.org/10.1371/journal.pone.0299491>
4. Marques, A. P., Ramke, J., Cairns, J., Butt, T., Zhang, J. H., Muirhead, D., Jones, I., Tong, B. A. M., Burton, M. J., Gilbert, C. E., & Burn, H. (2021). Global economic productivity losses from vision impairment and blindness. *EClinicalMedicine*, 35, 100852. <https://doi.org/10.1016/j.eclinm.2021.100852>
5. Wong, B., Hennessy, J., Stern, J., Everett, B., Yusufu, M., Hu, W., Burnett, A. M., Morton, M., Radin, M., & Vu, M. (2025). *The value of vision: The case for investing in eye health*. Seva Foundation, The Fred Hollows Foundation, & IAPB. <https://visionatlas.iapb.org/>
6. Wong, B., Singh, K., Everett, B., Yusufu, M., Hu, W., Burnett, A. M., Morton, M., & Stern, J. (2023). The case for investment in eye health: Systematic review and economic modelling analysis. *Bulletin of the World Health Organization*, 101(12), 786–799. <https://doi.org/10.2471/BLT.23.289863>