

Closing the Corneal Blindness Gap in Pakistan: Cost-Effectiveness of a Physician-Founded Corneal Transplant Program

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PURPOSE	RESULTS		CONCLUSIONS
Pakistan bears a disproportionate burden of corneal blindness and corneal opacity accounts for 11.8% of severe visual impairment nationally, far exceeding India (<1%) and Bangladesh. Pakistan had no domestic eye donation system until recently and relied on Sri Lanka for tissue until 2017. This study evaluates the cost-effectiveness and replicability of a physician-founded nonprofit model that coordinates US eye banks to deliver corneal tissue to government hospitals across Pakistan, restoring sight to underserved patients at no cost.	Pakistan's Vision Loss Burden 1.12M Blind individuals nationally 6.79M With moderate vision loss 11.8% Due to corneal opacity Zafar & Mir Foundation Program Impact 8,500 Corneal transplants facilitated 39 Government hospitals across 5 provinces \$3.06M Total tissue value delivered 1,623 Corneas delivered in 2024 alone Cost-Effectiveness Analysis Tissue cost averaged \$360 per transplant approximately 3% of the ~\$11,557 per QALY benchmark for penetrating keratoplasty in high-income settings. Remaining costs (surgeon time, OR, post-op care) absorbed by government hospitals. Vision restoration in young patients carries significant economic returns. Clinical Cases; SIOVS, Pakistan Three young male laborers (ages 19–27) from rural Sindh: one with corneal scarring from prior keratoplasty with donor rejection; two with corneal degeneration. All stable and discharged within one day with visible post-operative improvement. Access barriers included distance from tertiary care, lost wages, and lack of healthcare awareness.	Cost Per Transplant vs QALY Benchmark This Program (tissue cost only) \$360 High-income setting QALY benchmark \$11,557 Program Geographic Reach Punjab Sindh Khyber Pakhtunkhwa Balochistan Gilgit-Baltistan + Afghanistan Replicability Physician community willing to fundraise US eye banks with international shipping Government hospitals able to perform surgery No new infrastructure required	In countries without domestic corneal donation, nonprofit organizations coordinating with US eye banks represent a highly cost-effective solution for corneal blindness. The Zafar & Mir Foundation has delivered 8,500 sight-restoring surgeries at a tissue cost of ~\$360 per transplant, with remaining costs absorbed through government infrastructure. This model's core elements of fundraising, US eye bank coordination, and government hospital partnerships are transferable to other low-resource settings globally. Prospective visual outcomes data collection would strengthen a definitive cost-effectiveness analysis and the case for broader policy adoption.
METHODS Programmatic Analysis Zafar & Mir Foundation records capturing transplant volume, tissue value, and hospital reach across all 5 provinces Clinical Observation Firsthand observation over one month at SIOVS, Sindh and documenting three consecutive keratoplasty cases including sociodemographics, diagnoses, and access barriers. Cost-Effectiveness Tissue cost-per-transplant compared against published QALY benchmarks for keratoplasty, interpreted within GBD 2017 estimates of Pakistan's vision loss burden	GLOBAL IMPACT 12.7 Million people awaiting corneal transplants globally This model represents a cost-effective blueprint for closing that gap. Any country with a dedicated physician network and an unmet corneal transplant need can replicate this.		
Data Sources: Zafar & Mir Foundation records GBD 2017 SIOVS Clinical Observation Published QALY benchmarks			

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