

Eye Health in Pakistan: Implications for Eye-Bankers

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HEALTH AND VISION STATUS OF PAKISTAN

Pakistan, the 7th most populous country in the world, is located in southern Asia and bordered by India, China, Afghanistan, Iran and the Arabian Sea. It is comprised of 4 provinces, and widely considered to be a developing country with the potential to become one of the world's major economies, despite current demographic and socioeconomic barriers. With an urban population comprising 38.8%, the percentage of Pakistanis who are rural dwellers is 61.2%. The country has faced challenges with vision impairment and blindness as key elements of the overall health status of its people. Estimates vary as to the total population, and also as regards the numbers of blind and visually impaired. In 2010, the International Agency for the Prevention of Blindness (IABP) reported that 7.6 million individuals in Pakistan were visually impaired and of those, 1.2 million were blind. Recently, the Fred Hollows Foundation (FHF) estimated that about 10% (18 million) of the Pakistani population was living with some sort of visual impairment and around 2 million individuals were living with blindness. This estimate would assume a total population of 180 million. Other estimates place the total figure over 200 million.¹ A 2006 study estimated the crude prevalence of blindness among Pakistanis older than 30 years to be 2.7%, and among all ages, 0.9%. Total numbers of blind were approximated to be 1.25 million (1.1 – 1.35 million) with a projected total reaching 2.4 million in 2020, assuming the current prevalence remains the same.

There has been extensive work undertaken by the government of Pakistan in scaling up its health systems, including vision care programs. Today, health care services, including eye health services, are administered on a district level. The Comprehensive Eye Care (CEC) Cells provide basic vision services and promote awareness of district-level specialty eye services. The IABP notes that because of the work that has already been done in development of Pakistan's health services, the costs of strengthening the vision

care system would bring about a higher “rate of return” on any investments into eye health infrastructure.

Major Public Health Issues

Pakistan has several major public health challenges impacting the quality of life for many. The country is currently ranked 26th in the world for infant mortality as of 2016 with 53.9 deaths/1000 births.¹ This indicator, defined as the death of a baby before his or her first birthday, is considered a powerful measure of the overall health and wellbeing of a country, as the factors affecting population health also affect the mortality of infants. Poor water sanitization also continues to be an ongoing problem, with 51 million Pakistanis at risk of blinding trachoma, and 72,000 in an “advanced state of disease leading to blindness.”

Childhood malnutrition is of particular concern. According to the UNICEF 2016 Pakistan report, 44% of children in Pakistan are chronically malnourished (stunted) while 15% are acutely malnourished (wasted). Malnutrition contributes to mortality and blindness. Similarly, the United Nations Development Programme (UNDP) estimates that 45% of children under the age of 5 are moderately to severely stunted. Not only is this situation not improving, it shows signs of worsening. According to a 2016 news story in the Pakistan Daily Times, 67.6% of households across the country do not currently have the financial resources to provide adequate nutrition.

Literacy is another pressing problem. Literacy levels, particularly in rural areas, have direct implications for health planning and public health interventions. The literacy level of a population helps to indicate the extent to which using written materials to convey eye health information would be an effective strategy. Shah et al reported the proportion of Pakistanis identified with functional low vision who were not literate was 91.5%. Similarly, Jadoon et al⁴ found high levels of illiteracy, with 85.2% of women and 53.8% of the men in their survey illiterate, and a “significant asso-

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ciation between age and literacy.” Further, the Jadoon study also found that literacy level was associated with blindness, with a prevalence of 4.5% for illiterate individuals, as opposed to 0.7% of the literate. For increased effectiveness, the million to restore sight should be integrated with a public health and education approach.

Vision Progress in Pakistan

The Pakistan Ministry of Health conducted two National Blindness Surveys, in conjunction with WHO, in 1989-1990 and 2003-2004, with the most recent study providing the 1.25 million estimated total blind.⁴ Among all age groups, the overwhelming main cause of blindness was cataract, accounting for 51.5% of all blindness.¹⁴ The Ministry of Health found these results to be deeply troubling and was thus compelled to take actions that eventually led to the formation of the National Committee for the Prevention of Blindness, which became the National Eye Health Committee in 2008.⁵ In the 15-year span between the two surveys, Pakistan and partner organizations were successful in reducing the prevalence of blindness by 50%, from 1.8% to 0.9%.⁴ Of particular note is that while the percentage of cataract blindness was reduced from 66.7% to 51.5%, the percentage of blindness due to corneal opacity remains essentially constant, decreasing marginally from 12.6% to 11.8%.⁵ The WHO estimates that corneal opacities account for 4% of the world’s blind. The percentage is thus higher in Pakistan, where the main causes of corneal blindness are Vitamin A deficiency, trauma, traditional eye care practices, trachoma, and measles. The greatest barrier these patients face in restoring their eyesight is the lack of corneal tissue and transplant capability. For eye banks, this represents the area of greatest opportunity.

More research is needed to determine the true prevalence and causes of corneal pathologies in Pakistan, although progress is underway. As an example, a 2011 clinical audit of patients presenting at a Karachi hospital cornea clinic found that microbial keratitis was the most common cause of disease. The researchers pointed to a need for community based studies to determine causes of corneal blindness and to launch prevention programs tailored towards the major causes. In 2006, Jadoon and colleagues from Pakistan National Eye Survey Study Group concluded that women, the elder-

ly, and the uneducated are disproportionately affected by low vision and blindness.⁴ Thus, vulnerable populations and causes of disease continue to comprise a major area of focus for planning.

Economic Impact of Blindness

The loss of sight is something that intuitively affects an individual’s quality of life. Across societies and populations, the costs of blindness can have broad societal and economic impact.⁸ Investments in the restoration of sight, and in eye health infrastructures, thus have the potential to help bring about social change in the developing world. A 2014 study, commissioned by the Fred Hollows Foundation working together with Price Waterhouse Coopers, found that the return on investment for developing countries was four to one. The IABP reported in 2013 that in Pakistan in particular, every dollar spent on vision has the potential to yield six dollars in return. In “The Economic Burden of Blindness”, Awan and colleagues present the rationale for including vision restoration as part of the overall poverty reduction goal. The researchers were able to demonstrate that restoring sight yields quantifiable economic benefits to the country as a whole. Averaged earnings were used to estimate productivity differences due to blindness. This measure was deemed to be more accurate than household income (which can come from a variety of sources) since wages are the source of income most frequently sacrificed by the blind. The authors found that if the blind population in Pakistan (from all causes) were rehabilitated, the total productivity gain would equal 0.7% of the country’s GDP; if only avoidable blindness were treated, the savings would be equivalent to 0.6% of GDP. These percentages equate roughly to Pakistan’s total spending on health care.¹⁹

Access to Health Services/Eye Services/Barriers

A lack of reliable public transportation options in Pakistan and poor roads constitute a financial and logistical barrier to accessing health care facilities in general. In the rural areas, the long travel distance is a significant barrier, particularly for women who need someone to accompany them, as women often need permission from male heads of household to seek treatment. Differences in vaccination rates also illustrate this rural-urban disparity in access. Among

children aged 12-23 months, 48% in rural areas and 66% in urban areas are fully vaccinated. That vaccination coverage is 18% higher in urban areas than in rural area supports the conclusion that there may be significant disparities in the access to or utilization of healthcare services in general.

Cost of treatment is a potent barrier given the fact that patients are primary payers. In fact, 86% of health care costs are paid out-of-pocket. High levels of out-of-pocket spending are acknowledged to have a deterrent effect on patients seeking care. While the percentage of health care spending compared to GDP is low, the poverty rate is high, with current estimates being as high as 40%. Pakistan has recently issued, for the first time, a report on poverty which stated that 39% of the population is experiencing “multidimensional poverty” with greater numbers in the rural provinces. This new poverty index considers more than income, thus providing a clearer picture of the ways in which people’s lives are marginalized. The UNDP also released a report in 2016 citing extreme poverty in Pakistan. Out-of-pocket payments for health care, combined with overall poverty, underscore the inability of many individuals and families to receive health care services.

Eye banking services are specifically impacted by the reality that eye banks cannot be separated from the medical establishment and its health systems. Therefore, if a large proportion of the citizenry has never benefitted from obtaining needed treatment, the lack of positive experience with the health system may contribute to unwillingness to become eye donors and to take actions that would be needed to establish sustainable donation systems, contributing to a continuing lack of donor tissue. Other public health efforts that have been successful in Pakistan can lend useful insight into which strategies are likely to succeed there. Similarly, an examination of donation systems that have been implemented in marginalized segments of other societies can provide crucial insight.

Eye Health Workforce

Awan and colleagues point to the need for standardized, high quality training for eye health professionals. The SAO, a council of ophthalmologists that is a part of the South Asian Association for Regional Cooperation Countries (SAARC) identified the need for trained personnel as “critically impeding access to eye care.” SAO worked with the Fred Hollows Foundation (FHF) and the International Council of Ophthalmology (ICO) to determine the need for eye health workers in the region. The SAARC region was found to have one ophthalmologist for every 92,000 people. India and Pakistan had one ophthalmologist per less than 90,000.²⁷ Among several of the SAARC countries, oph-

thalmologist training was identified as a priority whereas in Pakistan, there is a greater need for training of other eye health professionals in order to offer integrated support for vision as a part of the overall health care system.²⁷

Similarly, the PAPAB/FHF report outlines a need, in the discussion on Eye Health Human resources, for “provincial and national centers for training an eye health workforce.” The report cited a rise in the number of ophthalmologists from 1500 in 1993, to 2200 by 2012 (citing data from the Pakistan Medical and Dental Council). FHF worked with the Ministry of Health to design and implement PADECS – Pakistan Australia District Eye Care in 2 phases from 2002-2006 and 2007-2013, and the PASEC Project, Pakistan Australia Subspecialty Eye Care, 2008-2013.¹⁶ In addition, sustainable eye health services are acknowledged to require standardized training for mid-level eye care personnel (MLECPs) and the inclusion of eye care to the primary care duties of the Lady Health Workers.¹⁶ A new category of ophthalmologists was initiated in 1998 by Pakistan Institute for Community Ophthalmology (PICO) in support of district eye care services: Community Ophthalmologists who hold additional training equivalent to a Master’s in Public Health. The impact of this program has extended beyond Pakistan to other countries where ophthalmologists have taken the PICO course in Africa, China, Indonesia, and Sri Lanka.⁵

There is currently no accredited cornea fellowship in Pakistan, although FHF has developed a subspecialty project focusing on vitreo-retinal (VR) and pediatric ophthalmology, in response to Pakistan’s young population (1/3 are children) and an increase in diabetic burden leading to retinopathy. FHF reports, as of 2013, that the 2-year accredited fellowship training includes 11 positions for VR specialists (5 in Punjab), 9 positions in pediatric, with none in cornea and glaucoma. However, 6-month subspecialty training positions exist with five in cornea and five in glaucoma. Three of the cornea specialists are in Punjab, 1 in Sindh, 1 in Khyber Pakhtunkhwa, and none in Balochistan.¹⁶ Of note in 2017, Lahore General Hospital has begun doing corneal transplants.

Alignment of Pakistan National Programme & UN Global Action Plan

Pakistan launched the National Programme for the Prevention of Blindness in 1994, commencing with the first 5-year plan from 1993-1998, followed by the second 5-year plan in 1999-2003. The upgraded facilities and services that resulted from the National Programme have supported a steady increase in the numbers of outpatient visits and cataract surgeries.¹² The National Programme aligns closely with WHO’s Global Action Plan (GAP) and the United Na-

tions 2030 Agenda for Sustainable Development agenda, a comprehensive agenda for the entire planet, espoused by world leaders.

The GAP was endorsed by all WHO member states, as part of WHA 66.4 in 2013, including the achievement of “Universal Eye Health” over the next five years. WHA 66.4 directly endorses the GAP, and outlines its objectives towards achievement of universal eye health as follows:

- 1) generate evidence on the etiology and extent of visual impairment and eye care services for use in advocating for member states’ commitment to eye health;
- 2) encourage the development and implementation of integrated national eye health programs; and
- 3) address the need for multi-sectoral engagement and effective partnerships.³⁰

In September 2015, WHO Resolution 70/1 outlined the Agenda for Sustainable Development, including the 17 Sustainable Development Goals (SDGs) and 169 subcategories, known as targets. The SDGs function as the framework for policymaking and action, for accomplishment of the UN Agenda. Several of the SDGs and their subcategories are deemed by the IAPB as being either highly relevant, very relevant, or relevant to eye health. IAPB, WHO, and their partners are working on a major joint effort to establish programs in furtherance of universal eye health that will foster planning by individual countries towards these objectives, integrating vision needs with health care systems. As explained by Zoe Gray, Advocacy Manager for IABP, “There is a target on universal health coverage, offering a potentially integrated approach which requires health systems strengthening, and creates entry points for eye health.”

Pakistan is the first country to have adopted the SDGs as its national development agenda and is certainly a leading example of a nation where this work is indicated. As mentioned previously, blinding trachoma continues to be a problem in Pakistan. Neglected tropical diseases (NTDs) are specifically referenced in the SDGs, and trachoma, the leading NTD is still the leading cause of blindness from infectious causes worldwide. Progress that has been achieved by the Pakistan National Programme provides an “evidence based, replicable model” that can be adopted by other developing nations in pursuit of their own eye health programs.⁶

CONCLUSION

Pakistan is a leading example of a country with a high level of unmet need for human corneal tissue, and which

is almost entirely dependent on imported corneas from Sri Lanka, the United States, and Canada. This need can be alleviated with an increase in import sources and with development of a sustainable eye banking system. Further, a continuing assessment of the prevalence and causes of corneal blindness will provide a clearer picture of the true extent of disease and thus pave the way for increased treatment and research opportunities. Obtaining this information is not only valuable for eye bank development and innovation; it is useful in terms of advocacy for greater prioritization of corneal pathologies by the Pakistan National Eye Health Committee and the Districts, by the primary funding agencies such as AusAID and FHF, and by leading NGOs such as WHO and IABP, particularly as these entities are already engaged with expanding the vision agenda.

The interests of today’s eye banking operations are well aligned with the vision elements of the UN Global Action Plan. GAP objectives that have vision implications represent tremendous partnership opportunities focused on overall eye health. U.S. eye banks have the experience and expertise to offer support with assembling the evidence base, and also with health policy planning that is needed to strengthen integrated eye health programs around the globe.

For the present, and for the future, significant opportunities exist for eye banking not only in building awareness of current and future unmet need and addressing the need with support and infrastructure, but also to partner in gathering data related to corneal disease and treatments, in Pakistan and in other developing countries facing similar challenges today. Eye banks are an essential component of the universal eye health agenda.

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