



PEEK VISION

Delivering comprehensive affordable eye care in Kenya

SERVICE DELIVERY

Implementation date: January 2013 - March 2014

Ophthalmic health is an important public health issue particularly because eye-related morbidity can have major impacts on other aspects of social development, including quality of life and level of productivity, particularly in developing countries.

According to the World Health Organization, 285 million people worldwide are visually impaired and 39 million of these people are blind. However, 80 percent of blindness is avoidable. Moreover, a disproportionate 90 percent of blind people live in low-income countries and it is these areas of greatest need where patients do not have access to diagnostics or treatment.

During the planning and implementation of Africa's first eye cohort study (The Nakuru Eye Cohort) by the International Centre for Eye Health in Kenya, the need arose to make ophthalmic screening portable, bringing services to the patient. There was a clear need to use portable equipment while maintaining the rigorous standards of care for ophthalmic screening. The Portable Eye Examination Kit, known as Peek, is a smartphone-based system that carries out a full range of ophthalmic diagnostic tests in even the remotest of settings where clients are often unable to seek out screening and diagnostic services.

About Peek Vision

In low-income countries, more people have access to mobile phones than running water. Peek presents a solution to support eye care systems where those most in need are the least likely to access care. A team of ophthalmologists, developers and engineers have created a mobile app and clip-on hardware that transforms a low-cost Android smartphone into an eye examination and diagnostic suite, capable of running a range of tests, including visualization of the back of the eye. It is easy to use, affordable and portable. A health worker with minimal training can use Peek to gather detailed clinical information. Images are graded and

patients diagnosed, either through an automated process, or via cascading of digital images to a network of experts around the world. Peek can diagnose blindness, visual impairment, cataracts, glaucoma, macular degeneration, diabetic retinopathy and other retinal and optic nerve diseases and crucial indicators of brain tumor and hemorrhage. The system stores contact information and GPS data for each patient. Google-map integration allows a novel way to follow-up and treat patients. More broadly, such technology allows coordination of services, to target mass treatment campaigns to the regions of greatest need.

Evaluation and Results

A large validation study was conducted comparing Peek alongside conventional reference standard equipment which was used on approximately 2,500 study participants as part of the Nakuru Eye Disease Cohort Study, in Kenya.

Close to 50 percent of participants in the follow up study (>1,000 participants) were examined using both Peek and standard screening exams. The results obtained from standard diagnostic equipment and Peek application and hardware are being compared to determine if Peek is as sensitive and specific as conventional eye examination equipment and the levels of agreement. Among the 1,000 participants, all have received some form of treatment. Some of the participants had sight improved-restored with surgery or glasses. Analysis is now ongoing with a target of publishing the results in a peer-reviewed journal in 2014.



Lessons Learned

- The portability of screening services allows a larger proportion of the population to be screened, reducing missed opportunities to address avoidable blindness, particularly among hard to reach populations
- The system has to be developed on the ground and in the local context with feedback from the population it will be serving
- Build communication channels for constructive feedback and improvement of mHealth tools
- mHealth does not work in isolation from the healthcare providers and recipients and therefore expectations must be appropriate

Conclusion

Peek has the potential to reduce avoidable blindness, particularly in low and middle-income countries. Based on results of the validation study in Kenya, there are opportunities to introduce utilization of Peek in other countries where there is great need. A strong evidence base is required for uptake and ongoing engagement with the existing health infrastructure to help strengthen, rather than replace models of delivering health care.

Geographic Coverage: Kenya

Implementation Partners: LSHTM, University of Strathclyde, NHS Glasgow Centre for Ophthalmic Research

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