Economic Impact

The economic impact of the KIDROP programme can be indirectly measured by evaluating the blindness prevention quotient in financial equivalents. Thus far 512 children have received vision restoring laser treatment. The return on investment in the national perspective may be calculated as follows: Each of these 512 infants will survive to an average age of 65 years (average life expectancy) and earn approximately USD 900 per annum (per capita income). This is a federal saving of over USD 25 million! All this for an investment of less than USD 250,000.

The social returns are, of course, priceless. As we previously reported, barriers of cost and infrastructure must be met. The cost of the camera alone is currently around approximately USD 135,000 in India. The technical barriers, however, are the “mental barrier” of the care-givers created by a mixture of poor awareness, inadequately trained personnel and unwillingness to adapt to innovation. However, there is hope that with time, patience and passion, these barriers can be overcome.

A Viable Model

In conclusion, tele-ROP is a viable model in middle-income countries. The cost utility analysis comparing the KIDROP model with other alternate strategies indicates that the KIDROP model, which uses a single Retcam shuttle to service a zone of roughly 300-400 kilometers radius in six districts using non-expert physicians (trained technicians) is the most costeffective method of providing the standard of care in ROP screening in centers which are rural or peripheral with limited access to health care given the current scenario of limited experts and funds. Each country with similar demographic and financial milieu as India must explore tele-ROP as a viable financial model and customize it to suit their local needs.

Thu, 16 February 13.00 – 14.30 hrs Hall 7 Session: PED – Pediatric Retina
Author: Anand Vinekar, MD, FRCS Associate Professor and Director of Pediatric Retina Narayana Nethralaya Postgraduate Institute of Ophthalmology Bangalore, India
E-Mail: anandvinekar@yahoo.com www.narayananethralaya.org www.facebook.com/KIDROP

Economic Implications

The economic consequences of the KIDROP programme can be measured by economic impact and financial milieu as India must explore tele-ROP in countries with similar demographic and limited experts and funds. Each country with rural or peripheral with limited access to health care given the current scenario of limited experts and funds. Each country with similar demographic and financial milieu as India must explore tele-ROP as a viable financial model and customize it to suit their local needs.

In 2008 we started Asia’s first tele-ROP screening programme in Southern India to cover unscreened rural neonatal care centers in the state of Karnataka. Under this programme KIDROP (Karnataka Internet Assisted Diagnosis of Retinopathy of Prematurity) was launched to provide an efficient and effective tele-Retina service to our Pediatric Retinopathy Screening Programme.

BANGALORE – The need for telemedicine in Retinopathy of Prematurity (ROP) in middle-income countries like India is born out of the skewed demand and supply problem present in ROP management, the largest causes of infant blindness worldwide.

Of the 27 million live births annually in India, about 8.8% are born below 2000 grams and are at risk of ROP. However, a majority of these infants are born in rural areas and remain unscreened. With more than 500 retinal surgeons and 20 ROP specialists, there is a huge unmet need for ROP management in India.

In conclusion, tele-ROP is a viable model in countries with similar demographic and financial milieu such as India to reduce the incidence of ROP as a cause of childhood blindness.

Asia’s First Tele-ROP Screening Programme

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has granted USD 0.52 million (2009-2012) to set up two zones that cover six districts each. Our contribution will include free training, image reading and treatment. The government will provide for the equipment, its maintenance and financial compensation of the technicians in the outreach.

Thus far, we have completed over 25,000 imaging sessions and recruited over 6500 infants for the KIDROP programme in more than twelve districts of Karnataka state covering two zones, each having a radius of care of around 400 kilometers. In this study, we present a cost-utility evaluation of the KIDROP programme. We used the financial audited data in our study to complete an economic evaluation that employs Analytic Hierarchy Processing (AHP), a multi criteria decision model for comparing the KIDROP strategy (which uses a single Retcam shuttle for 6 districts) to three alternate strategies of ROP screening.

Alternate Strategies
The three alternate strategies were hypothesized and were:
1) Parents in the rural outreach are educated, sensitized and urged to travel to the city for screening their infants at the city based headquarters. The last strategy is similar to KIDROP but needs to have several Retcams servicing each district.

Criteria for Cost-Effectiveness
Cost-effectiveness in all four strategies was calculated using three criteria:
1) Organizational costs: costs incurred by the ‘provider’ (who could be a private or a public enterprise or a public-private partnership)
2) Burden weight: burden to the parents or guardians of the child including direct and indirect costs
3) Disease coverage: number of 'disease susceptible' as a proportion covered under the strategy.

Using AHP, the overall ranks comparing these strategies were then calculated by the matrix multiplication of the AHP Modified Weights matrix with that of the Priority Weights matrix. Sensitivity analysis and the analysis of uncertainty were also performed to evaluate the maximum and minimum budgetary requirements for implementing each strategy. 'Best case' and 'worst case' scenarios were computed against each strategy and intervention to determine the best strategy in hypothetical and actual situations.

When the maximum patient coverage was considered as the goal (the best screening strategy), the KIDROP model ranked as the best screening strategy for all three scenarios i.e., the provider’s perspective (funding organization), the patient’s perspective (GOS, KIDROP Shuttle on 6 districts) to three alternate strategies of ROP screening. This was the strategy that had the lowest cost but produced the poorest outcomes for the patients and the families. Hence, the KIDROP model ranked as the ‘best screening strategy in four out of six situations’.

Best Screening Strategy in Four out of Six Situations
Hence, the KIDROP model ranked as the ‘best screening strategy’ in four out of six situations. In all situations tele-ROP ranked higher than the other interventions where the specialist or the patient had to travel for screening. The lowest rank in all six situations was the strategy where mothers had to travel to the city with their infants for ROP screening. This was the strategy that had the lowest patient coverage, since most parents in rural areas were daily wage workers and belonged to the lower economic strata making travel costs with the family a heavy burden on their resources.

The fact that repeated visits are needed before discharge from the screening programme, further adds to problem of travelling which compounds the costs for the family. Poor compliance to complete the screening meant higher risk of blindness. The multiple Retcam strategy had the best coverage but caused a larger financial burden on the organizations that fund and manage the programme. In a public private joint enterprise, it was more likely that funds would be limited and needed prioritization. In our own setting, we were able to convince the Government to fund only one Retcam per zone.

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Lучшая скрининговая стратегия в Четырех из Шести Ситуаций
Таким образом, модель KIDROP ранжировалась как "лучшая стратегия скрининга" в четырех из шести ситуаций. Всех ситуаций теле-РН ранжировалась выше, чем другие методы, в которых специалист или пациент должны были ехать для выполнения скрининга. Самый низкий ранг из всех шести ситуаций имела стратегия, где матери должны были ехать в город со своими младенцами для скрининга РН. Эта была стратегия, которая имела самую низкую стоимость, но необходимость низкий охват, так как большинство родителей из сельской местности были работниками поденной оплаты труда и принадлежали к низшей экономической категории, что было препятствием для поездки семьей за свой счет. Это было тяжелым бременем.

Тот факт, что перед выходом из скрининга требуются повторные визиты для исследования, добавляют дополнительные затраты семьи на поездку. Недостаточно полное проведение скрининга означает высокий риск слепоты. Стратегия множества Retcam обеспечивала максимальный охват населения, но требовала большего финансового затрат на стороны организации, которые спонсировали и проводили программу. В свою очередь, стратегия KIDROP заслуживалась для каждого района и вмешательства, чтобы выявить лучшую стратегию в таких ситуациях.