

Chapter 1

Introduction



1.1 Background and rationale

Visual abnormality is the condition that can severely affect the quality of life. Brown studied the relationship of the vision and the quality of life and found that people felt significant loss of quality of life even at slightly loss of their visual acuity. For example, at the visual acuity of 20/40 (slight blurred vision, the level which the person is still able to read or to drive) the average quality of life was 0.80. For persons who were legally blind (visual acuity less than 20/200, the level which the person has difficulties to move about by his or her own) the quality of life was reduced to 0.66. (Brown, 1999)

The World Health Organization (WHO) tried to estimate the number of people who had severe visual disturbances (blindness and low vision). The WHO's review of the global blindness scenario estimated that globally there were 180 million visually-disabled people. Of these, 45 million people were unable to move about without help and were classified as blinded (visual acuity <0.05 or Snellen 20/400 in the better eye or a visual field no more than 10 degree around central fixation). (World Health Organization regional office for South-east Asia, 2000a) It is estimated that an additional 2 million newly blinded cases occurred every year. (Taylor & Keeffe, 2001) Cataract is responsible for more than half of the blindness. Trachoma and childhood blindness account for 15% and 4% respectively. (World Health Organization regional office for South-east Asia, 2000b) When considering the less severe visually impairment, recent studies find that refractive error is responsible for one quarter of blindness and half of low vision. This problem exists even in the developed country such as Australia. It is estimated that there are 1.4 million blind children in the world, and in every

minute one child is going blind, of whom the majority live in developing nations. (Gilbert, 2001; Gilbert & Foster, 2001) Many children are born blind or lose their vision early in life. About two third of all blindness is avoidable. Time is an important factor in management of childhood blindness. The earlier the management begins, the better the result will be.

The distribution of blindness and visual impairment are different among regions of the world. For the south-east Asia region, it is estimated that about one-third of the world's 45 million blind people, and half of the world's 1.5 million blind children live in this region. The region is estimated to have 60 million visually impaired persons. About ninety per cent of the blindness in this region is avoidable (preventable or curable). (World Health Organization regional office for South-east Asia, 2000b) Blindness is estimated to cost the countries of the region US\$ 5.6 billion annually, in lost productivity, education and rehabilitation. The life expectancy of blind persons is one-third less than that of their sighted peers. Most of the blind persons die within 10 years of becoming blind.

Table 1.1 Profile of South-east Asia according to visual impairment

Profile of South-East Asia
25% of world's population
33% of world's blind
40% of world's poor
50% of world's childhood blindness
60% of world's cataract backlog
Highest number of blind persons among WHO Regions

Source: WHO (World Health Organization regional office for South-east Asia, 2000a)

International initiatives for the prevention and control of blindness are not new. They have been part of the WHO's international health development agenda for many years. The first initiative by WHO in prevention of blindness was the control of trachoma program launched in 1956. In 1999, the WHO launched "*Vision 2020: The Right to Sight*", a global initiative to eliminate avoidable blindness. Recognition of sight as a fundamental human right by all countries can be an important catalyst of initiatives for the prevention control of blindness.

In June 2002, in response to the Vision 2020, the WHO organized a meeting to plan for the prevention of childhood blindness. The importance of childhood blindness, which is the second largest cause of blind-person years were discussed. Vision care is of particular importance in children because of two main reasons. The first reason is that there is a critical period for visual development in children. If the child who has any abnormality in the visual system early in life is not treated in time, the visual development process will be hindered and could not be treated later. The second reason is that vision is the major prerequisite for learning. The WHO suggested the member countries to start some projects to help children with visual abnormalities.

From the total population of 62.9 million in Thailand, there are 15.9 million in the age group of 0-14 years. If we estimate that about 3-5% of the children having serious visual abnormalities, about 477,000 to 795,000 children will need assistance. If we include less serious conditions such as refractive errors, the number is estimated to be about ten times larger. With this large number of people to be served, there should be a very efficient program to take care of this problem.

Sight for Kids program is a pilot program to initiate a vision screening in selected schools under the Bangkok Metropolitan Authority (BMA), as the response for the WHO suggestion. The program started in 2002 by developing screening kits and training school teachers to do the vision screening. The screening method in the Sight for Kids program included visual acuity test and stereopsis test. After screening, a mobile team (composed of ophthalmic

personnel) was sent into the schools to examine the screen positive children. The program administrators planned that if the program is successful it will be extended to other provinces.

1.2 Research question

What is the appropriate school vision screening model to be used in Bangkok? (What is the cost effectiveness of the screening program if we use only one screening test rather than combined tests; or if we refer the positive screening children to the hospital rather than sending in mobile teams?)

1.3 Research objectives

The general objective of this study is to evaluate the sensitivity and the specificity of the school vision screening tests used in the Sight for Kids program, and to evaluate the cost-effectiveness of the school vision screening program using the baseline data of the Sight for Kids Program. The analysis is from the societal perspective.

Alternative 1: vision screening using visual acuity test and stereopsis test by school teachers and provision of refractive eye care by mobile teams. (The original method used in the Sight for Kids program)

Alternative 2: vision screening using visual acuity test by school teachers and provision of refractive eye care by mobile teams.

Alternative 3: vision screening using visual acuity test and stereopsis test by school teachers and detected cases refer to existing health care system.

Alternative 4: vision screening using visual acuity test by school teachers and detected cases refer to existing health care system.

The specific objectives of this study are to:

1. Calculate the sensitivity and specificity of the school vision screening tests.
2. Determine the referral compliance rate
3. Calculate the societal cost of each alternative.
4. Evaluate the effectiveness of each alternative.
4. Determine the cost-effectiveness of each alternative.
5. Compare the cost-effectiveness of the alternatives.

1.4 Scope of the study

The scope of this study is to analyze the cost effectiveness of the vision screening model in the schools under the BMA that participating in the Sight for Kids program. The cost of the program include the training cost, screening kits development cost, screening process, and first step management which includes basic refraction and ophthalmic examination for the students with positive screening results. The cost is calculated from the program administrator's perspective and also from the parents' perspective. The effectiveness is defined as the number of children with visual abnormalities screened and seen by ophthalmic personnel. The results of this study are from the school vision screening for students in the urban low socioeconomic families.

1.5 Possible benefit

The results of this study will be used to modify the school vision screening program. The information from the study will be beneficial for the program administrator to make the decision on how to run the program. It may be adopted to be used in planning information to expand the vision screening program to other provinces of Thailand.