



Guidelines for School Eye Health for the Eastern Mediterranean Region (EMR)

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Developed by the Eastern Mediterranean Regional office of the International Agency for the Prevention of Blindness (EMR-IAPB), in collaboration with World Health Organization regional office for the Eastern Mediterranean Regional Office (WHO-EMRO) and the Prevention of Blindness Union (PBU). Supported by IMPACT-EMR.



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FOREWORD



In the last few years the Eastern Mediterranean Region of the International Agency for the Prevention of Blindness (EMR-IAPB), supported and sponsored by IMPACT-EMR, have been at the forefront of presenting a strong advocacy voice to ensure that eye care is given the deserved attention in policies and activities of governments, multilateral organizations and regional/international agencies.

Beyond that, IMPACT-EMR also encourages and supports the development of ideas and strategies that will alleviate the high burden of visual impairment in the region, thus achieving the noble goals of the global initiative for the elimination of avoidable blindness by the year 2020, “VISION 2020: The Right to Sight”.

There was a prevailing need to develop a comprehensive strategy in EMR to preserve sight in children and provide an environment for the best possible development of school children. EMR-IAPB, funded by IMPACT-EMR as part of its commitment to support blindness prevention programs, led the way in developing broad guidelines for the implementation of eye health in schools in the region.

With the development of these guidelines we aim to further encourage its implementation across the region, to ensure that the mental, social and physical development of our future generation is not hampered in any way by visual problems.

I would like to personally thank Prof. Daud Khan for his leadership in this project and all the other members of the committee for developing this very important document; we hope the guidelines will also be useful for other regions of the world.

Abdulaziz Ahmad Abdulaziz Al Saud

Chairman, EMR- IAPB

Chairman, IMPACT-EMR

EMR-Consultative Meeting on School Eye Health



One of the most challenging issues in VISION 2020 has been the whole range of problems in children, one of them being School Screening. Over the years this process has undergone refinement and many perspectives have been added to this.

IMPACT-EMR, EMR-IAPB and Prevention of Blindness Union (PBU) in collaboration with WHO-EMRO held a 3 days meeting in March 2009 in Bahrain, where it brought together experts in Refractive Errors and Low Vision, Child Eye Health, Health Systems Development, Community Ophthalmology, Pediatric Ophthalmology, Programme Managers, National Coordinators and Social Health Managers.

Guidelines were developed for Screening for School Eye Health keeping in view the emerging needs in School Health.

These guidelines address core issues on which countries can further develop/ adapt them according to their own environment and circumstances.

We hope that these guidelines will go beyond the EMR for adoption and utilization.

We gratefully acknowledge the participation and contributions of all the technical experts in putting together these guidelines. I am especially thankful to my co-chair, Mr. Hasan Minto for his efforts to help organize this meeting. We acknowledge the support of IMPACT-EMR and Prevention of Blindness Union (PBU) for putting this meeting together.

Prof. M. Daud Khan

Chair, Consultative Meeting on School Eye Health

Co-Chair EMR-IAPB

Introduction

Health, including visual health is inextricably linked to school achievement, quality of life, and economic productivity. Health education in the school setting is of fundamental importance as in acquiring and building knowledge of child and adolescent health, the values, abilities, skills and practices necessary for a healthy life are acquired. These best practice guidelines are developed by IMPACT-EMR, EMR-IAPB, Prevention of Blindness Union (PBU) and WHO-EMRO offices; for the health care authorities, educational authorities developing eye care programmes at the school, health planners, eye care delivery organizations and professionals.

It provides the basic directions to develop appropriate school screening programmes linked to accessible and affordable refraction and corrective services to get a reduction in preventable blindness and low vision in the region due to refractive error and other visual impairing conditions in children through early detection, refraction and correction. These guidelines are not prescriptive and countries/programmes can and should adopt these to fit the local context. However, these guidelines provide an overview on the general principles for setting up a school eye health programme and are based on the evidence and best-practice from the various parts of the world.

It needs to be remembered that the children of today are the adults of tomorrow. What they learn in school about eyes and eye health, how to protect their eyes and what to do to prevent eye diseases will impact on future generations.

Background: The need for school eye health programmes – prevalence and types of refractive errors

The World Health Organization (WHO) has recently estimated that 153 million people worldwide are visually impaired from uncorrected refractive errors, 8 million of whom are blind¹. The report suggests that 12 million children of school going age (5-15 years) are visually impaired from uncorrected refractive errors, and population based surveys undertaken using standard methods and techniques² suggest that 90-95% visual impairment in this age group is due to myopia. Uncorrected myopia is, therefore, a major public health problem among children. Another factor to consider is that individuals who are myopic, particularly those with more than 6D of myopia (high or degenerative myopia) are at increased risk of cataract, retinal detachment, macular degeneration and open angle glaucoma later in life.

Current interventions for myopia include spectacles, contact lenses or photorefractive laser surgery, all of which aim to correct refractive errors only and do not influence the underlying condition. Despite extensive research into other interventions e.g. bifocals, atropine-like drugs, there are currently no interventions which have a significant impact on the development or progression of myopia, or on the excess risk among myopes of other ocular diseases.

Given the large number affected by uncorrected refractive errors the cost of providing services is considerable. For example, in Singapore, where myopia is highly prevalent, \$90million is spent each year on spectacles, approximately \$3 million on refractive surgery and \$2.0-2.5 million treating myopia related eye conditions – in a country of only 4 million³. A recent publication by Baltussen indicates that programmes for the detection and treatment of refractive errors among school children would be highly cost effective in all regions of the world⁴.

Since 2000, there have been eight surveys of children which used standard NEI/WHO methods i.e. definition of myopia $\leq -0.5D$ spherical equivalent measured using cycloplegic autorefraction, and the data have been analysed and presented in similar ways². The surveys show a) myopia to be higher in older children than younger children in all populations apart from rural Nepal; b) the prevalence is higher in urban than rural areas; c) the all-age prevalence varies, generally being higher in Asian children. The highest prevalence among

15 year olds was in urban China (73.1%) and the lowest in rural Nepal (2%). In the Chinese urban sample 4.8% of 15 year olds were highly myopic (i.e. -6.00D or more) (Appendix I).

Estimates for the EMRO Region

The number of children affected by significant refractive errors in EMRO B and EMRO D countries, in different age groups of school going children is shown in Appendix II. The data take account of the fact that school attendance is lower in secondary schools than in primary schools. In the EMRO B countries approximately 2.2% of children aged 11-15 years are myopic compared with 1.5% in EMRO D countries.

Across the region, there are estimated to be 1.25 million secondary school going children aged 11-15 years with refractive errors.

The need for school eye health programmes – other endemic conditions affecting children

It is important that school programmes do not just narrowly focus on refractive errors, as school health initiatives have the potential to have a positive impact on locally endemic diseases which affect the eyes of children such as vitamin A deficiency and trachoma. Both these conditions affect children living in poor communities in many countries in the region, particularly in EMRO D countries. For example, Pakistan and Sudan have foci of trachoma and vitamin A deficiency⁸⁻¹¹; trachoma is prevalent in Egypt¹² and is largely being controlled in Morocco^{13, 14} and Oman³¹. Vitamin A deficiency has also been reported from Afghanistan¹⁵ and is likely in other countries in the region which have under 5 mortality rates of more than 50 /1,000 live births¹⁶.

Other conditions where school programmes can have a positive impact are epidemics of viral conjunctivitis, by helping to reduce the spread and warning children of the dangers of traditional eye remedies; the diagnosis and treatment of vernal keratoconjunctivitis, and in supporting children who have low vision.

In many developing countries optical services are lacking, and many teachers over the age of 40 years have un - or under corrected presbyopia. If the condition could be corrected by the simple provision of a pair of reading

spectacles (and checking the optic nerve to exclude glaucomatous cupping) this would greatly heal in preparing and marking school work and examination scripts.

Primary education is at the base of the pyramid of education, and is regarded as a fundamental human right today. In addition, it has several tangible social and economic effects. As an essential component of human capital, primary education plays an important role in the economic growth and development of a country. In EMRO, there are about 160 million children and adolescents between the age of 5 and 18. This population holds the potential to create a better society, with democracy, equity and quality of life. The challenge is to provide conditions to meet their basic needs especially in health and education. This places a significant responsibility on the education and health sectors.

Education has the potential not only to change individuals' lives but to fuel fundamental social transformation. The Health-Promoting Schools Initiative, an innovative and comprehensive approach which has been piloted and implemented in many developing countries, can ensure healthy and enabling environments for children and strengthen health and life skills education, which are critical ingredients for quality education. The key components of Health-Promoting Schools Initiative are attached as Appendix VI.

The Health-Promoting Schools Initiative responds to the needs of the countries to strengthen their capacity to increase quality, equity, relevance and efficiency ensuring access and completion of primary education for all children. Improving health and nutrition, healthy lifestyles and life skills among school children will contribute to quality secondary education, increase school performance and reduce dropout rates. Recognizing that healthy behaviors need supportive environments, which the existing school health programmes are not adequately achieving, there is a need to explore innovative options such as Health-Promoting Schools Initiative, a comprehensive and effective strategy. The Initiative uses a comprehensive and multidisciplinary approach for understanding and addressing children in the context of their daily life, within their family, community, and society.

There are several school initiatives in EMRO countries but most focus on refractive errors. Oman has a well organized and integrated programme, and

data are collected which allow the programme to be monitored and evaluated.

In Saudi Arabia, school eye health is embedded within the health system for children. In other countries, such as Pakistan, programmes are piece meal and varied with little co-ordination.

Experience from Oman: Integration of eye health care with school health/ primary health care

In 1991, comprehensive eye health care was integrated with newly established school health system. Prior to this, in a vertical trachoma control program from 1883 to 1990, central teams of opticians focused on care of trachoma and vision for students of all levels annually. Activities included training of newly appointed school doctors and nurses, annual examination of all 1st grade children for active trachoma and other common eye diseases. Nurses tested vision and school refractionists offered refractive services (including cycloplegic refraction) to students of 1st preparatory and 1st secondary grades within the schools. Spectacles are prescribed if myopia is ≥ 0.75 D or hypermetropia is ≥ 1 D (without symptoms). Ministry of Education provide free of cost spectacles. Compliance of spectacle wear is reviewed every year. Although school health was merged with the Primary Health Care (PHC) system in 1995, eye screening continued in schools. It was expanded to cover 4th grade students from 1998.

The vision, refractive error and trachoma are noted in health booklet. Computerized Health Information Management System provides coverage, magnitude of active trachoma, refractive error, low vision separately for boys and girls. Evidence based information on eye problems in children is generated through operational research. The outcomes are shared with health staff, researchers and community.

Health promotion is an integral part of eye care in schools. To impart messages for keeping eyes healthy, doctors use posters and 'health for all' book. They stress on prevention of trachoma and diabetic retinopathy. The ocular and vision hygiene are integrated in the school curriculum.

The students with low vision that are identified through school health are rehabilitated within schools. Vision screening and refractive services also cover

children with other disabilities. Schools in private sectors were encouraged and supported for vision screening.

Regional program teams comprise of refractionists, ophthalmologists, school health In-charge, and other selected health staff. They monitor regional activities and report to the national team. Indicators related to eye care of students are used to follow 'Five Year Health Plans' and 'VISION 2020 – Oman'. Eye health through school health was crucial for reaching 'Trachoma - no more a public health problem in Oman'.

Key Learning from Oman model

- Eye screening could be a vertical program to begin with and integrated with school health subsequently.
- Refractive services should be provided within the schools.
- Screening should also focus on the priority eye diseases in children like trachoma, amblyopia and low vision.
- Health promotion should be part of comprehensive eye care for students.
- Until preschool/ amblyopia screening is established, 1st grade screening should be continued.
- Eye care teams should continue providing technical support, monitor quality and evaluate the data even after integration with PHC.
- Quality check of vision screening improves efficiency of the services.
- Dedicated program teams are crucial for sustainable achievements and they should be periodically appreciated.

Experience from Pakistan: Integration of Two Health Programs:

In most developing countries, primary eye care is not usually integrated within broader primary health care initiatives, even though national programs for prevention of blindness place great emphasis on this. The country story below illustrates how eye health can be positioned and integrated within an existing primary health care program at national level. It provides a very useful analogy for embedding school eye health within a wider school health program.

In Pakistan, female health workers (known locally as a 'lady health workers') have formed the backbone of the primary health care system for the past fifteen years.

These women are members of the communities they serve and are responsible for 150-200 households (around 1,000 people) each. They provide primary health care with a focus on reproductive health and family planning. During the day, they visit women at their homes. In the evenings, community members go to their local health workers' home (known locally as the 'health house') for health advice and basic care, including first-aid. Although eye care has been included in lady health workers' responsibilities since the beginning, it hasn't been a priority. Thanks to the renewed commitment to eye care by Pakistan's national government in recent years¹, however, there has recently been a greater emphasis on eye care in the training of lady health workers.

Lady health workers undergo three months of classroom training in primary health care, followed by field work lasting twelve months. During the classroom period,

lady health workers receive between three and five days' training in primary eye care. During the year of field work, they interact with communities who have eye problems; they also receive one or two additional days' hands-on training in community eye care while in the field to enable them to better understand community eye health issues. Until recently, training had been provided by ophthalmologists based in district community eye care programmes. Data in the Federally Administered Tribal Areas showed that, after being taught the revitalized eye care curriculum, lady health workers dealt with more than three times as many eye patients as colleagues in other provinces who hadn't yet received the training.

In 2007, however, Sightsavers International and College of Ophthalmology Allied Vision Sciences (COAVS) Lahore started a national programme to develop master trainers within the National Programme of Family Planning and Primary Health Care (the programme responsible for lady health workers); these master trainers now conduct all training of lady health workers in Pakistan.

A training manual in the local Urdu language has been developed in consultation with all parties and approved by the national eye health committee. On completion of their primary eye care training, lady health workers are able to perform a basic vision assessment (they are given E-charts

to use in their community) and to deal with conjunctivitis and foreign body injuries. They are also able to screen for cataract, trachoma, low vision, and childhood blindness, among others, and to refer community members to nearby eye care services where necessary. Now, the challenge for the programme is integration of eye data into national HMIS, for which advocacy and lobbying is going on with the Ministry of Health.

Components of a comprehensive school eye health programme

The ideal school eye health programme for children should encompass the following and be integrated into the school health programme:

- Identification of children with significant refractive errors, with provision of high quality spectacles that look good and which are comfortable, durable and affordable.
- Health education or other activities to prevent or treat locally endemic diseases e.g. face washing and the importance of a clean environment at home to prevent trachoma.
- Provision of presbyopic correction for teachers, if required.
- Promoting healthy school environment e.g. growing vitamin A rich foods in a school garden; water collection for face washing.
- Identification and referral of common eye complaints of children (e.g. styes; conjunctivitis).
- Using the Child-to-Child approach to take eye health messages home, and to use children as “case detectors” of individuals in their families or community who need eye services.

1. Planning Strategies for the School Eye Health Programmes in EMR region

1.1. Goal

To improve quality of life and education capabilities by eliminating blindness and visual disability particularly due to uncorrected refractive errors in school children.

1.2. Key Objectives of a School Eye Health Programme are to:

- Identify students with vision problems through:
 - o Selected vision screening procedures
 - o Establish mechanism for delivery of high quality refractive services linked to cost effective and appropriate optical services
- Establish follow-up procedures to assist identified students in receiving appropriate care.
- Inform teachers and parents of students with vision problems about recommendations from eye care personnel regarding the most appropriate management and classroom environment.

1.3. Target Populations

The priority age groups for screening are ideally the children: at the entry into primary school (1st grade), the top class in primary school (5th grade) and in secondary school (8th grade). However, if resources are limited: start with top class in primary school (5th grade). In addition, any other child with visible eye defects or disease; a) squint, b) white pupil, c) nystagmus, d) abnormal head or face turn, e) red eyes, f) inability to copy from the black board, g) complaint of chronic headache or lack of concentration should also be screened and provided/referred to services.

2. Definitions

- 2.1. WHO definitions of blindness and visual impairment apply to the correction of refractive error.

Blindness is defined as uncorrected visual acuity less than 3/60 in the better eye.

Visual impairment

- For children up to 15 years of age, visual impairment is defined as uncorrected visual acuity less than 6/12 (20/40) in the better eye.
- For people over 15 years of age, visual impairment is defined as uncorrected visual acuity less than 6/18 (20/60) in the better eye.
- Low Vision is defined as best corrected visual acuity of less than 6/18 to 3/60 (20/60).

3. Delivery of Services Guidelines

3.1. Situation Analysis

Prior to embarking on a school eye health programme, a situation analysis needs to be carried out of what is already in place in terms of:

- Relevant health and education policies,
- Relevant health and education legislation,
- Presence of international agencies and national bodies who support child health,
- Presence of international agencies and national bodies who support education,
- Support, capacities and capabilities in Ministry of Health and Ministry of Education (e.g. training curriculae for teachers; Inspectorate Division in Ministry of Education),
- Services for refractive errors (e.g. spectacle frames suitable for and acceptable to children),
- Nature and effectiveness of current school eye health initiatives (e.g. VA cut off; % of children who fail; % of refracted prescribed spectacles; compliance rates with spectacles; spectacles frames provided),
- Co-ordination between health and education for eye health programme.

3.2. Key Questions for Programme Planning

Before starting a programme the following questions need to be addressed and answered within the context of the country:

- Is a school eye health programme indicated?
- What is the prevalence of uncorrected refractive errors?
- What is the prevalence of endemic diseases?
- Are there other more important demands on the resources available?
- Age at which vision should be tested, and which schools should be included?
- How often should vision be tested?
- Which components will be included?
- Who will measure the vision?
- What should the cut-off visual acuity be?
- How will children needing glasses or other treatment be

managed and financed?

- How will it be monitored and evaluated?
- How can quality be assured?
- Will the programme be cost effective?
- Will it make any difference to children's' lives?

3.3. Flow chart of activities:

- Map location of primary and secondary schools (formal and informal sectors).
- Make contact with relevant bodies and authorities in education and health.
- Identify teachers to be trained.
- Train teachers.
- Screening in schools.
- Refraction in schools of those who fail.
- Referral of children whose vision cannot be improved to the local eye unit, with provision of low vision care for those who need it.
- Provide spectacles that are high quality, affordable and comfortable: it is essential to ensure that children needing spectacles receive them and how this is done will vary from location to location depending on local resources.
- Ensure quality control procedures are in place.
- Establish effective management including information management systems.
- Monitor and evaluate the programme.
- Operational research.

3.4. Preparing for the Visual Acuity Screening

- Select a focal person who could be a refractionist, optometrist, ophthalmologist in each district to coordinate the school eye health programme; the school screening may be carried out by several teams of field staff or teachers under the responsibility and guidance of the focal person. Screening should only be done when resources are available for follow-up of refraction and spectacles.
- Select the target population by grade or level. Screening last grade of primary school is highly recommended due to an

increase of the prevalence of myopia by age 12. A screening for children entering primary school will detect low numbers with refractive errors; however, it may help detect other eye defects and amblyopia.

- Visual acuity should be checked and recorded at the time of admission in class 1, promotion to class 5, and in the 8th grade.
- The focal person should choose the schools and make appointments with principals and teachers to explain the programme. Ensure the school teachers training and provision of kits and institutional commitment. The focal person should be making all the logistic arrangements.
- Screening teams should comprise of two school teachers ideally the PT and science teacher (a teacher wearing spectacles would be added advantage) and professionals in eye care (ophthalmic technicians and refractionists) who should train the teachers in screening for visual acuity and six signs of healthy eyes and refer those in need.
- The necessary equipment: The chart: should be made of strong white cardboard of a size of 15 x 15 cm and should have 4 optotypes “E” of size 20/40 (6/12) in different directions. The optotype size should be calibrated for a testing distance of 3 meters. Each team should be provided with 3 cards in case any is lost or damaged. One tape or rope of 3 meters (10 feet). An occluder that can be made out of a 10 x 10 cm piece of cardboard so the child can alternately cover each eye, the School Screening Programme - Record Sheet (See appendix IV) and the School Screening Programme - Referral Form (See appendix V).
- Choose the site where the tests will take place, it is recommended that it should be a well illuminated and quiet place without windows or objects beside it that can distract the child or produce light reflections which can cause confusion. The distance between the chart and the child should be 3 meters.

3.5. Visual Acuity Testing

- A properly trained person should take the visual acuities.
- Fill the child name on the screening form.
- Take the chart close to the child and explain that you will point at any of the 4 “E” and s/he should point at the direction of the “legs”.
- If the child normally wears eye glasses to see at the distance, tell her/him to leave them on during the test.
- Ask the child to stand up at 3 meters using the tape of rope as a guide and to cover the left eye with the occluder to test the right eye first. Then ask the child to cover the right eye to test the left eye.
- Stand behind the 15x15 cm cardboard “E” chart and point at any of the 4 “E”. Rotate the board so children cannot memorize it.
- The test is passed if each eye can see 3 of the 4 symbols.
- The results of the test should be recorded as pass or fail for each eye at the School Screening Programme - Record Sheet. This form also contains date of the screening, name and address of the school, class, teacher’s name, and name of the children, date, age and a column of referrals. In the absence of the Record Sheet the school class attendance register can be used adding the pass-fail column.

Refraction

- Refraction examination should only be carried out by eye care personnel with the appropriate skills.
- Objective refraction with cycloplegia
- Subjective refraction
- Ocular motility and cover test
- Measurement of near vision
- Eye examination to detect other conditions

Prescription

Low power spectacles should not be provided, as they are unnecessary and will not be worn. This is a waste of resources and the programme is open to exploitation through unscrupulous prescribing. The

following are recommended minimum refractive errors that should be corrected:

- Myopia: equal to, or greater than -0.5D
- Hypermetropia: equal to, or greater than +2.0D
- Astigmatism: equal to, or greater than 0.75 CYL

Scenarios for provision of spectacles

- Ideal: refraction + prescribing + dispensing done in the school.
- Next: refraction + prescribing done in the school. The child selects their frame preference and the local eye unit makes up the spectacles which are then taken back to the school.
- What is not recommended: children who fail the vision screen are referred to local optometrists/refractionists for refraction, prescribing and dispensing.
- It is desirable to receive the financial support for the refractive services from the governmental programs budget. The cost per child seen at consultation should be at an affordable price.
- The spectacles should be provided by a qualified provider at an affordable price or fully-subsidized and must be of good quality, attractive and comfortable.
- The average cost for a pair should be affordable. The low cost spectacles can be paid by the children parents. When possible include spectacles in the package of benefits of a governmental program.

3.6. Follow-up procedures

Follow-up procedures include coordination of activities, interpretation of findings, sharing of information among school staff and parents, and referring to eye care specialists.

- The success of the programme is dependent on the effort given to the implementation of a systematic follow-up procedure including:
 - o Referral to appropriate services
 - o Efficient record-keeping; the visual status information is a basis for making any adjustments to the student's educational programme.
 - o Maintain contact with the key stakeholders until the student has received the needed examination and

necessary care.

- Develop and implement a system for follow-up of referrals and record screening results and pertinent information on the students' cumulative health record.
- Consult with teachers and recommend necessary educational adjustments to meet individual needs.
- Follow through with procedures for students with visual impairments.

3.7. Visual health promotion

Build client and community awareness about eye health, refractive error, the benefits of correction and the availability of services.

3.8. Other considerations

- The costs involved per child screened should be calculated every year.
- The screening should be a public service at no cost to the children.

Primary stakeholders include:

- Communities, particularly parents and children with uncorrected refractive error;
- Providers from public, private and non-profit sectors. These providers include:
- Ophthalmologists, community ophthalmologists, optometrists, refractionists, refractionists, ophthalmic assistants, ophthalmic technicians, primary eye care workers, community health workers, general practitioners, health care managers, etc.
- School teachers, school principals and volunteers.

4. Monitoring and Evaluation of the Programme

It is recommended to use a selection of indicators to evaluate the programme. Sources of data for monitoring are health management information systems, Hospital/clinic records, special population-based studies in coverage, barriers. The key performance indicators for school eye health programme should include:

- Number and % of primary schools with a programme
- Number and % of secondary schools with a programme
- Number of children screened
- Number of children who fail screening
- Number of children refracted
- Number of children dispensed spectacles

Appendix I (a): Data on the Prevalence of Refractive Errors in Children

Data on the prevalence of myopia from the WHO/NEI standard surveys

Country (region)	Urban/ rural	N	Age group (yrs)	Prevalence of myopia* [95% confidence interval]
Latin America:				
Chile, La Florida ²⁹	Suburban	5,303	5-15	6.8% [95% CIs not given]. Age increase: from 3.4% to 19.4% in girls; from 3.4% to 14.7% in boys.
Brazil, Sao Paulo ³⁰	Suburban	2,441	11-14	5.5% [4.6-6.4%]. Age increase: from 5.4 to 6.1%.
Asia:				
Malaysia, Gombok ³¹	Suburban	4,634	7-15	19.3 % [15.9-22.8]. Increased from 9.8% at 7 yrs to 34.4% at 15 yrs
India, New Delhi ³²	Urban	6,447	5-15	7.4% [5.0-9.7%]. Age increase: from 4.7% to 10.8%
India, Andhra Pradesh ³³	Rural	4,074	7-15	4.1% [3.3-4.9%]. Age increase: from 2.8% to 6.7%.
China, Yangxi ³⁵	Rural	2,454	13-17	42.4% [35.8-49.0%] Age increase: from 36.8% to 53.9%.
China, Guangzhou ³⁶	Urban	4,364	5-15	35.1% [33.2-36.9%]. Age increase from 3.3% to 73.1%
Africa:				
South Africa, Durban ³⁷	Urban	4,890	5-15	2.9% [2.1-3.8]. Increased from 1.9% at 5 yrs to 9.0% at 15 yrs

*Spherical equivalent of at least -0.5D

Appendix I (b): Data on the Prevalence and Types of Refractive Errors from Other Surveys

Country	N	Age group (yrs)	Definition of myopia	Prevalence
Eastern Mediterranean Region:				
Oman	416,157	6-17	$\geq 0.75D$	4.1% (4.06 - 4.18)
Pakistan A (Gadap Town)	3,000	11-15	$\leq -0.5D$	2.86%
Pakistan B (Bannu)	2,304			3.3%
Cairo	5,839	7-15		22.1%
From other regions:				
Chinese children in Sydney and Singapore ³⁸	752	6-7	$\leq -0.5D$	3.3% children in Sydney, 29.1% children in Singapore
Australia, Sydney ³⁹	2,367	12	$\leq -0.5D$	Outer suburban, 6.9%; inner city, 17.8%.
Chinese children in Sydney and China ⁴⁰	957	7-9	$\leq -0.5D$	Children in Singapore 36.7%; children in China, 18.5%.
Australia, Sydney and Malaysia ⁴¹	3,714	7-9	$\leq -0.5D$	Malays in Kuala Lumpa 9.2%; Malays in Singapore 22.1%
Israeli conscripts ⁴²	276,911	16-22	$< -0.75D$	29.8%
Danish male conscripts ⁴³	4,681		$\leq -0.5D$	12.8%
Polish school children ⁴⁴	4,422	6-18	$\leq -0.5D$	13.3%
Mongolia: rural children ⁴⁵	Add	7-17	$\leq -0.5D$	5.8%

Appendix II: Estimates of the number of school going children of different ages who have refractive errors
[from Baltussen and Limburg]

EMRO B	Total pop (1,000s)	%<15 yrs	N <15 (1,000s)	N 6-15 yrs Treatable RE =	1.30% 1.30%	11 to 15 year's Treatable RE =	2.20%	11 yr olds
Bahrain	743	27.3%	203	159	2,072	80	1,753	351
Iran	70,495	29.6%	20,867	16,395	213,137	8,198	180,346	36,069
Jordan	5,600	37.3%	2,089	1,641	21,336	821	18,053	3,611
Kuwait	3,328	20.5%	682	536	6,969	268	5,897	1,179
Lebanon	3,928	27.2%	1,068	839	10,913	420	9,234	1,847
Libya	5,419	32.4%	1,756	1,380	17,934	690	15,175	3,035
Oman	2,577	32.4%	835	656	8,528	328	7,216	1,443
Qatar	1,305	22.6%	295	232	3,012	116	2,549	510
Saudi Arabia	24,242	32.6%	7,903	6,209	80,722	3,105	68,304	13,661
Syria	19,172	31.5%	6,039	4,745	61,686	2,373	52,196	10,439
Tunisia	10,225	25.3%	2,587	2,033	26,424	1,016	22,358	4,472
United Arab Emirates	4,106	19.5%	801	629	8,178	315	6,920	1,384
EMRO D				35,455	460,911	17,727	390,001	78,000
Afghanistan	24,500	27.3%	6,689	5,255	52,553	2,628	39,414	7,883
Djibouti	720	40.0%	288	226	2,263	113	1,697	339
Egypt	73,435	37.7%	27,685	21,752	217,525	10,876	163,144	32,629
Iraq	29,000	43.1%	12,499	9,821	98,206	4,910	73,655	14,731
Morocco	30,841	27.8%	8,574	6,737	67,366	3,368	50,524	10,105
Pakistan	156,000	37.8%	58,968	46,332	463,320	23,166	347,490	69,498
Palestine	3,762	45.7%	1,719	1,351	13,508	675	10,131	2,026
Somalia	7,960	44.4%	3,534	2,777	27,769	1,388	20,827	4,165
Sudan	37,239	41.3%	15,380	12,084	120,841	6,042	90,630	18,126
Yemen	21,535	45.0%	9,691	7,614	76,142	3,807	57,106	11,421
Subtotal:				113949	1,139,492	56,975	854,619	170,924
TOTAL:				150,000,000	1,600,402	75,000,000	1,244,620	248,924

Appendix III: List of Participants

No.	Name	Designation
1.	Prof Mohammed Daud Khan (Chair)	Vice Chancellor, Khyber Medical University, Pakistan Co-Chair, EMR-IAPB
2.	Mr. Hasan Minto (Co-Chair)	Program Development Advisor Sightsavers International
3.	Dr. Clare Gilbert (Rapporteur)	Professor, International Centre for Eye Health Chair, IAPB Child Eye Health Committee
4.	Ms. Sumrana Yasmin (Rapporteur)	Program Advisor Low Vision, Sightsavers International
5.	Dr. Haroon Awan	Director, Strategic Program Development, Sightsavers International
6.	Dr Ebtisam AlAlawi	National Coordinator, Prevention of Blindness National Committee, Bahrain
7.	Dr Saad Hajar AlGhamdi	National Coordinator, Prevention of Blindness National Committee, Saudi Arabia
8.	Dr. Abdulhannan Choudhury	Medical Officer for Prevention of Blindness, WHO- EMRO
9.	Dr. Hannah Faal	Program Development Advisor, Sightsavers International Past President, IAPB
10.	Dr. Rajiv Khandekar	Organizing Secretary, National Eye Health Care Committee, Oman
11.	Prof. Asad Aslam Khan	National Coordinator, Prevention of Blindness National Committee, Pakistan
12.	Dr. Muhammad Mansur Rabi	Director of Programmes, IMPACT -EMR
13.	Dr. Muhammad Babar Qureshi	Executive Director, CHEF International Director Programs, EMR-IAPB

Appendix IV: School Screening Programme – Record Sheet

Date of the screening _____/_____/_____

Name and address of School_____

Class: _____ Teacher:_____

Name	Date Dd/mm/yy	Age	Right Eye P/F	Left Eye P/F	Referred Y/N

Number of children screened _____ Number of referral_____

Signed_____

Date:_____

Appendix V: School Screening Programme – Rerreral Form

The child did not pass the test:

Name: _____

Age: _____

Name of the school: _____

Name of the teacher/class: _____

Parent name: _____

Address: _____

Telephone number: _____

Date of school screening test (dd/mm/yy): _____

Refer to: _____

Follow-up: _____

Appendix VI: Health-Promoting Schools Initiative

The Health-Promoting Schools Initiative has three main components:

1. Comprehensive school health and life skills education - directed toward the acquisition of knowledge, and the adoption and maintenance of abilities and skills that facilitate the achievement of an optimum level of health and quality of life.
2. Healthy and supportive environments and surroundings - development and strengthening of the capacity of the schools to create and maintain environments and surroundings that are supportive for health and learning. It includes basic sanitation and clean water; clean and structurally adequate physical spaces, safety from injuries and accidents; as well as supportive and enabling psychosocial surroundings, free from physical, verbal and/or emotional abuse, assault or violence.
3. Quality services: health, food and nutrition, including visual health, psychological support, counseling, and physical education - strengthening the relationship between the school staff, the health team, and key stakeholders of other relevant sectors. The Initiative emphasizes early and appropriate attention to schoolchildren, to detect, prevent, and properly and timely address health problems, including visual health, risk factors, behaviors and conditions.

Appendix VII: References

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