# STRATEGIES FOR THE PREVENTION OF BLINDNESS IN NATIONAL PROGRAMMES

## A primary health care approach

SECOND EDITION

World Health Organization
Geneva

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Second Edition

World Health Organization
Geneva
1997

First edition, 1984
Second edition, 1997

WHO Library Cataloguing in Publication Data

Strategies for the prevention of blindness in national programmes : a primary health care approach. — 2nd ed.

1.Blindness — prevention and control 2.Eye diseases — prevention and control
3.Eye infections — prevention and control 4.National health programs 5.Primary health care

ISBN 92 4 154492 9 (NLM Classification: WW 276)



TYPESET IN HONG KONG
PRINTED IN ENGLAND

95/10646—Best-set/Clays—7500

The World Health Organization was established in 1948 as a specialized agency of the United Nations serving as the directing and coordinating authority for international health matters and public health. One of WHO's constitutional functions is to provide objective and reliable information and advice in the field of human health, a responsibility that it fulfils in part through its extensive programme of publications.

The Organization seeks through its publications to support national health strategies and address the most pressing public health concerns of populations around the world. To respond to the needs of Member States at all levels of development, WHO publishes practical manuals, handbooks and training material for specific categories of health workers; internationally applicable guidelines and standards; reviews and analyses of health policies, programmes and research; and state-of-the-art consensus reports that offer technical advice and recommendations for decision-makers. These books are closely tied to the Organization's priority activities, encompassing disease prevention and control, the development of equitable health systems based on primary health care, and health promotion for individuals and communities. Progress towards better health for all also demands the global dissemination and exchange of information that draws on the knowledge and experience of all WHO's Member countries and the collaboration of world leaders in public health and the biomedical sciences.

To ensure the widest possible availability of authoritative information and guidance on health matters, WHO secures the broad international distribution of its publications and encourages their translation and adaptation. By helping to promote and protect health and prevent and control disease throughout the world, WHO's books contribute to achieving the Organization's principal objective—the attainment by all people of the highest possible level of health.

# Preface

This book was originally prepared by a working group for the WHO Programme for the Prevention of Blindness, and included contributions from several WHO Collaborating Centres. The book has been popular, enjoying a steady demand since its publication in 1984. When it sold out, it was decided to revise the book to include more recent developments, such as a simplified grading scheme for trachoma, the use of ivermectin against onchocerciasis and technological developments in cataract surgery. Furthermore, two chapters discussing childhood blindness and diabetic retinopathy have been added to the section "Methodological approaches to specific blinding conditions".

The WHO Programme for the Prevention of Blindness and Deafness gratefully acknowledges the valuable work done by past and present contributors. It is hoped that this book will continue to be widely used in planning and developing national programmes for the prevention of blindness.

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# Contents

# 1. Introduction and background

# The concept of avoidable blindness

Blindness is a major health problem that has received relatively little attention in worldwide efforts to promote health. The vast majority of the world's blind live in developing countries, where infections, malnutrition and lack of eye care give rise to a high proportion of blindness, particularly in rural populations. Thus these countries have blindness rates that are 10–40 times greater than those of industrialized countries, where blindness is due mainly to degenerative and metabolic disorders related to ageing.

It has been estimated that there are at least 38 million blind people in the world, if blindness is defined as the inability to count fingers at a distance of 3 metres. This is the definition recommended by WHO (see Table 1). There are also an estimated 110 million people with low vision, i.e. visual acuity less than 0.3 (6/18).

A major portion of blindness in developing countries either can be cured, or could have been prevented, by a reasonable deployment of skills and resources. This is termed avoidable blindness. Blindness of infectious or nutritional origin can easily be prevented, and visual loss from cataract can be restored by simple surgery. Endemic trachoma and associated infections affect approximately 150 million people in the poorer rural communities of developing countries and can be controlled through hygienic measures such as face-washing, the application of antibiotic ointments in children and corrective lid surgery in adults. Malnutrition resulting in severe vitamin A deficiency can cause permanent blindness by damage to the cornea. This is particularly true in children living under conditions of general malnutrition who are affected by superimposed diseases such as measles, diarrhoea and acute respiratory infections that can aggravate their vitamin A status. Cataract, or opacity of the crystalline lens of the eye, occurs more frequently with advancing age and may affect more than 90% of those over 60 years of age worldwide. Cataract constitutes the major cause of easily curable blindness in most regions, as vision can be restored by simple and effective surgery. The parasitic infection

**Table 1. Categories of visual impairment**[a]

| Category of visual impairment[b] | Visual acuity with best possible correction | |
|---|---|---|
| | Maximum less than: | Minimum equal to or better than: |
| 1 | 6/18<br>3/10 (0.3)<br>20/70 | 6/60<br>1/10 (0.1)<br>20/200 |
| 2 | 6/60<br>1/10 (0.1)<br>20/200 | 3/60<br>1/20 (0.05)<br>20/400 |
| 3 | 3/60<br>1/20 (0.05)<br>20/400 | 1/60 (finger-counting at 1 metre)<br>1/50 (0.02)<br>5/300 (20/1200) |
| 4 | 1/60 (finger-counting at 1 metre)<br>1/50 (0.02)<br>5/300 (20/1200) | Light perception |
| 5 | No light perception | |
| 9 | Undetermined or unspecified | |

[a] Adapted from *International Statistical Classification of Diseases and Related Health Problems*, Tenth Revision. Geneva, World Health Organization, 1992.

[b] Categories of visual impairment 1 and 2 are referred to as "low vision", categories 3, 4 and 5 as "blindness", and category 9 as "unqualified visual loss". If the extent of the visual field is taken into account, patients with a field no greater than 10° but greater than 5° around central fixation should be placed in category 3 and patients with a field no greater than 5° around central fixation should be placed in category 4, even if visual acuity is not impaired.

onchocerciasis is a major cause of blindness in some African countries, and is also present in certain areas in Central and South America; control of onchocerciasis, which used to depend solely on control of its blackfly vector, can now also be achieved through the administration of ivermectin to target populations. Blindness due to ocular trauma, a fourth cause of avoidable blindness, can be controlled by preventive efforts at the community level and by early, appropriate treatment. A fifth cause is glaucoma, a group of diseases generally characterized by elevated internal pressure of the eye and resulting in visual impairment. It accounts for about 15% of all blindness. Its control depends on case-detection and treatment with eye drops or surgery.

The general lack of eye health services in underserved communities in developing countries is responsible for much blindness. Early treatment of infectious and nutritional eye disease is essential to prevent visual loss, and such treatment can often be delivered effectively by auxiliary health personnel. The simple guidelines for strategies of primary eye care presented

in this publication should assist trained health workers in their efforts to deal effectively with most common eye diseases.

Blindness is a significant burden to society, in that the cost of lost productivity and of rehabilitation and education of the blind is very high and increasing. The swift and effective use of resources for the prevention of blindness will provide enormous savings in both money and human suffering. The cost of preventing blindness is only a small fraction of the expense of rehabilitation, so the cost-effectiveness of preventive measures, including surgery for cataract, is very high. The vast amount of human suffering attendant upon blindness, and the reduced quality of life it entails, can be gauged by the lower life expectancy of the blind in some developing countries.

Two principal objectives of the WHO Programme for the Prevention of Blindness and Deafness are to make essential eye care available to all populations and to eliminate avoidable blindness. Through effective programmes, national blindness rates can be reduced to less than 0.5%, with no more than 1% in individual communities. To achieve this, well-planned activities, originating at the national level, are required, using systematic community-based action to eliminate avoidable vision loss. At present, national plans for the prevention of blindness are being implemented or established in approximately 100 countries. However, unless rapid and systematic action is taken, the worldwide number of blind is likely to double by the year 2020.

# Overview

This publication describes the essential components of a national blindness prevention programme that can be effectively integrated into an overall primary health care system. The methods that an individual country can use to implement a programme will necessarily depend on existing health care delivery and blindness prevention activities.

Many effective "vertical" blindness prevention activities, such as for trachoma or xerophthalmia control, have been broadened to include activities relevant to the prevention of other blinding conditions. In areas where there are no activities yet in place and a primary health care system is being developed, blindness prevention should be included as an integral component. Emphasis should be placed on developing activities at the primary (village) level, as they will benefit the greatest numbers. However, secondary and tertiary facilities should also be developed to provide continued training, stimulation and support to the rest of the system, and care for more complicated cases, and to raise gradually the level of sophistication and competence of the entire national programme.

Although effective interventions have been developed for some major blinding disorders, like trachoma, malnutrition, cataract and onchocerciasis, the methods of dealing with other problems such as glaucoma are still evolving. There is therefore a great need for applied research to improve the effectiveness of preventive measures.

# General aspects of the primary health care approach to prevention of blindness

Primary health care consists of:

> ". . . essential health care based on practical, scientifically sound and socially acceptable methods and technology made universally accessible to individuals and families in the community through their full participation and at a cost that the community and country can afford to maintain at every stage of their development in the spirit of self-reliance and self-determination."[1]

The prevention of blindness should be an integral part of primary health care. There are three distinct, yet related, components in the primary health care approach, only the last of which requires direct interaction between a sick individual and medical personnel. They are:

— social and community developments that promote health through changes in behaviour and the environment and that lead to the reduction or elimination of factors contributing to ocular disease, e.g. the provision of adequate, safe water supplies, growing and consuming foods rich in provitamin A, construction and maintenance of pit-latrines;
— strengthening community cooperation to promote, within the family, the recognition and appropriate care of individuals at risk for blinding disease, such as adequate feeding and oral rehydration of children with severe measles or diarrhoea; immunization is also important (e.g. community awareness of eye care can be promoted by local committees);
— delivery of eye care to individuals with potentially blinding disorders (e.g. treatment and referral of infectious corneal ulcers by village-level workers or cataract surgery performed by mobile teams or at stationary facilities).

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[1] *Primary health care. Report of the International Conference on Primary Health Care: Alma-Ata, USSR, 6–12 September 1978.* Geneva, World Health Organization, 1978 (Health For All Series, No. 1), p. 3.

Of the three components, community and social development may be the hardest to achieve, but will eventually have the greatest impact. In many areas of the world, blinding infections and malnutrition have practically disappeared following moderate socioeconomic advances, despite the absence of specific disease control activities. As social development activities require some alterations in entrenched practices, they are necessarily difficult to achieve and slow to produce a noticeable effect. Their long-term impact, however, will be considerable and will ultimately produce marked savings for health care systems.

The provision of curative services has the most obvious and immediate impact and has therefore long received a disproportionate share of attention and resources. None the less, disadvantaged communities throughout the world suffer from a lack of suitably trained personnel to treat existing disease. As it is possible as well as efficient to manage most eye diseases in the communities where they arise, emphasis should be placed on the development of primary eye care and a good referral system.

# The development of eye health services

The prevention of blindness and the delivery of eye care should be integrated with general health services at all levels. Programmes should be based on available resources and technology that is appropriate for the country or region. The prevention of blindness requires a flexible approach and the incorporation of regular managerial and technical training for various categories of personnel. Programmes should be reviewed regularly, and improvements should be made that are consistent with economic growth and a social and cultural understanding of the population concerned.

## Primary eye care

Primary eye care comprises a simple but comprehensive set of promotive, preventive and curative actions that can be carried out by suitably trained primary health workers, specialized auxiliary personnel or other interested people. The development and implementation of primary eye care activities will depend on the existing primary health care system. Locally available personnel and training programmes for primary health care can be used to promote and strengthen the delivery of eye care at the peripheral level. However, in areas without any existing primary health care system, services for primary eye care should be developed which could eventually evolve into more comprehensive health care activities.

The primary eye care worker should carry out promotive and preventive activities, focusing on education and community participation to prevent visual loss. The clinical activities involved in primary eye care consist of simple means of treating the three major eye symptoms presented by patients: inflamed ("red") eyes, loss of vision and pain in the eye. At the primary level, the health worker can manage these problems by definitive treatment, by referral after immediate treatment or by referral alone.