

# guidelines for programmes for the prevention of blindness



WORLD HEALTH ORGANIZATION



GENEVA

The World Health Organization is a specialized agency of the United Nations with primary responsibility for international health matters and public health. Through this organization, which was created in 1948, the health professions of some 150 countries exchange their knowledge and experience with the aim of achieving the highest possible level of health throughout the world.

By means of direct technical cooperation with its Member States, and by stimulating such cooperation among them, WHO promotes the development of comprehensive health services, the prevention and control of diseases, the improvement of environmental conditions, the development of health manpower, the coordination and development of biomedical and health services research, and the planning and implementation of health programmes.

These broad fields of endeavour encompass a wide variety of activities, such as developing systems of primary health care that reach the whole population of Member countries; promoting the health of mothers and children; combating malnutrition; eradicating smallpox throughout the world; controlling malaria and other communicable diseases including tuberculosis and leprosy; promoting mass immunization campaigns against a number of preventable diseases; improving mental health; providing safe water supplies; and training health personnel of all categories.

Progress towards better health throughout the world also demands international cooperation in such matters as establishing international standards for biological substances, pesticides and pharmaceuticals; recommending international nonproprietary names for drugs; administering the International Health Regulations; revising the international classification of diseases and causes of death; and collecting and disseminating health statistical information.

Further information on many aspects of WHO's work is presented in the Organization's publications.

**GUIDELINES FOR PROGRAMMES  
FOR THE PREVENTION  
OF BLINDNESS**



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## PREFATORY NOTE

*These guidelines are meant to constitute a basic work of reference to be adapted and expanded as needed for the development of national and regional programmes for the prevention of blindness. They were prepared at a meeting held in Asilomar, CA, USA, in October 1978, and jointly sponsored by the WHO Collaborating Centre for Reference and Research on Trachoma and other Chlamydial Infections, F. I. Proctor Foundation, San Francisco; the International Eye Foundation; and the World Health Organization. The list of participants in the meeting is given in Annex 4.*



## GOALS AND STRATEGIES

Most of the blindness that afflicts an estimated 30–40 million persons in the world is potentially avoidable and occurs in the less developed areas where infections, malnutrition and cataract predominate, usually in conjunction. Further, the prevalence of visual impairment regarded as blindness is as much as 10–40 times higher in certain areas in the developing countries than in the industrialized countries.

There are simple and effective preventive measures that should be far more widely applied. These are incomparably less expensive than the cost to the community of caring for those who are afflicted by avoidable blindness. The main obstacles are lack of national commitment, inadequacy of managerial structure for application of these measures, and insufficient resources. The goal of the WHO Programme for the Prevention of Blindness is to eliminate this burden of avoidable blindness by reducing national blindness rates to less than 0.5%, with no more than 1.0% in individual communities. The blindness designated in these target figures corresponds to categories 3, 4 and 5 of visual impairment (see Table 1, on page 16) as described in the Ninth Revision of the International Classification of Diseases, i.e., impairment ranging from total blindness to inability to count fingers in daylight at a distance of 3 metres. Such a handicap precludes an individual from functioning effectively in his community without special assistance, including rehabilitation.

Effective programmes require systematic, community-based action to eliminate avoidable blindness and visual impairment. There are four components for action in national programmes and international cooperation.

(1) The first step is to identify communities with a high prevalence of avoidable blindness and to determine the causes of this blindness.

(2) Programmes should give high priority to the worst-affected communities. Intervention should first attack by preventive and therapeutic means the major causes of blindness in the community, such as malnutrition, infections, cataract, etc. Where there is a large backlog of patients in need of surgery for cataract or distorted eyelids, mobile surgical teams have proved effective. Such intensive interven-

tion creates a unique opportunity for mobilizing community participation and for selecting and training village health workers for continuing action to implement preventive measures.

(3) Primary health care should include the delivery of simple therapeutic and preventive measures for the promotion of eye health. Wherever specific programmes for the prevention of blindness are required, these should contribute to primary health care.

(4) Strengthening of intermediate and central (tertiary) ophthalmic services may be required in order to provide an adequate referral system, and for supervision and training.

What is required is a managerial structure to deliver eye care services, along with others, in underserved communities. Recognition of the multidisciplinary nature of the activities involved avoids the misunderstanding that equates the prevention of blindness with the availability of ophthalmologists.

## NATIONAL POLICIES

A national policy for the prevention of blindness should arise out of concern for an important problem that adversely affects the productivity and wellbeing of the people. It must be recognized that the successful implementation of a widescale, effective blindness prevention programme cannot be accomplished by the ophthalmic, the medical, or the scientific professions alone.

The financial and manpower resources essential to accomplish the objectives of prevention go far beyond the field of health. Any intervention must be soundly based on the realities of cultural and social factors, general education, food production, nutrition, water supply and transportation, in addition to health. This intervention needs support from the public and private sectors in these areas.

People concerned with the prevention of blindness must stimulate the national will to act. The organization of a committee, task force, or blindness prevention society may be a critical step. If effectively done, it can bring together the diverse sectors that must be involved in any coordinated effort. Such a body should consist of influential representatives from government, together with ophthalmologists, public health specialists and leaders in the media, in industry and in the community. It should provide a unified voice to inform policy-makers and planners of the extent of the problem and the cost of inaction. It should also encourage public awareness, act as a coordinating body, and assist in identifying existing and potential resources.

## INITIAL ASSESSMENT

### Assessment of Ocular Status

An understanding of the magnitude, geographical distribution, and causes of blindness within the region or country is crucial to the design of an effective intervention programme. Analysis of blindness registries, hospital and clinic records, and the like can suggest the existence of a significant ocular problem, but the limitations of such data should be recognized. Such analysis can never prove the absence of a problem, since lower socioeconomic groups, remote populations, and those who die (particularly young, blind children) are rarely included. Prevalence surveys are therefore the only means of developing unbiased estimates of the problem so that action can be initiated.

Where resources are limited, visual acuity screening can be carried out as part of other activities (malaria survey and control, primary health care, etc.). It is recommended that, in this case, all older children and adults be screened at a visual acuity level of ability to count fingers at a distance of 3 metres (3/60 Snellen). Definitive surveys of ocular status can then be conducted in areas found to have high levels of blindness and visual impairment.

### Goals and preliminary procedures

The goals of assessment will differ from one country to another, and will largely determine what examination procedures are adopted. In countries with more advanced health care delivery systems, the goal might reasonably be identification of all causes of visual impairment by a detailed clinical examination. In countries with more limited health resources, a more practical initial goal might be the assessment of the major causes of preventable or curable blindness.

Prevalence surveys require sound preparation. Sample size and site selection must be carefully considered; all questions should be clear, concise, presented in the local language or dialect, pretested under field conditions, and precoded for transfer to punch cards and tape. Field personnel must be carefully chosen and tested under field

conditions, unenthusiastic workers being replaced. Areas to be included in the survey should be visited ahead of time to enlist local cooperation, locate members of the community who will work with the team, identify work routes and arrange logistical matters (where the team will spend the night, transportation, etc.).

### **Sampling**

The method of sampling is of critical importance and expert statistical assistance should be enlisted when the planning starts and for the analysis of the results. It is not possible to give universally applicable guidelines on sampling, since the correct decisions will depend on a variety of local factors. Some general points, however, may usefully be made.

The results of prevalence surveys apply only to the population actually sampled. School-based surveys, for instance, reflect the status of children attending schools, and not of preschool children or those too remote or disadvantaged to attend. Similarly, screening of industrial workers gives results applicable only to such workers, which cannot be applied to rural agricultural workers or to the unemployed.

Random samples—multistage, stratified or cluster—are normally used. Multistage sampling eliminates the need for detailed listing of all individuals or communities in the country or region. Instead, a selection is made, on a random basis, between larger administrative or geographical units. In the next stage, subunits of these chosen larger units are then selected randomly and the process repeated until the required cluster size is obtained. A cluster may represent an entire village or portion of a village in which all the inhabitants are to be examined. Stratifying the sample into "like groups" will improve the precision of the results, and will often allow for meaningful comparisons. Thus, urban areas may be separated from rural areas, mountainous terrain from valleys, wet areas from dry areas, etc., the multistage sampling being carried out in each stratum. The larger the number of clusters, the more representative the results. The sample must be of sufficient size to detect, within acceptable confidence limits, the prevalence of the least common condition that occurs with sufficient frequency to justify intervention.

### **Personnel and procedures**

Auxiliary workers should be responsible for most routine procedures, including vision screening, but all ocular examinations should

be conducted by a person specially trained in ophthalmology (preferably a qualified ophthalmologist).

A house-to-house enumeration, with centralized examination points, is the most accurate means of assembling the cluster sample, and should be conducted when families are most likely to be at home. It is almost always necessary to arrange for a repeat visit on a different day or at a different time of day to pick up a large proportion of those individuals who were away at the time of the initial examination. At the first visit, only a small and potentially biased sample of the cluster may have been examined.

In a stratified examination scheme, all individuals should be screened for visual acuity and the adnexa and anterior segment of the eye examined with a hand-light and a loupe of suitable magnification. Local circumstances and goals will determine the level of visual impairment judged to be significant. Individuals thus identified as suffering from impairment at this level should undergo a more detailed clinical examination, including slit-lamp biomicroscopy, fundus examination with dilated pupils, and determination of intra-ocular pressure to establish the cause of the impairment. Ancillary examination methods may include photography of the cornea or ocular fundus. Data on the population's socioeconomic status, dietary habits, water supply, available medications, and knowledge, attitudes and practices (KAP), as well as the history of any lesions, might profitably be collected, and specimens may be taken for laboratory tests when indicated. This material will prove invaluable in designing effective intervention programmes. As was mentioned earlier, epidemiological and statistical skills are needed to choose the sample and carry out data analysis. All examiners should be adequately trained and their adherence to standardized procedures should be checked periodically.

It may be useful to conduct an eye clinic in the community surveyed. If it is properly publicized in advance, large numbers of patients with significant visual impairment or eye disease may present from surrounding communities not included in the sample cluster itself. The examination of these cases may offer additional information on the causes of blindness in that area. These data, however, cannot be used in determining prevalence, and may well be unrepresentative of the actual distribution of disease in the community at large. They should therefore be used separately and with caution.

The survey team should be prepared to treat whatever simple eye diseases are encountered (conjunctivitis, trachoma, vitamin A defi-



ciency, etc.), and refer cases with more serious lesions for definitive therapy (e.g., cataract extraction).

The prevalence survey serves as an important baseline for assessing future changes in ocular morbidity and the effectiveness of intervention programmes. It should constitute the first phase of a surveillance programme.

### Assessment of Vision

Visual acuity is the most readily tested indicator of visual function. Its testing does not require extensive training of examiners, a particular effort to enlist the cooperation and understanding of patients, or the use of elaborate equipment.

When applied to a population, the measurement of visual acuity can provide baseline data for later intervention to prevent blindness on a wide scale. The method and the extent of visual acuity testing are determined by the objectives of the programme or the planned intervention.

When applied to individuals, visual acuity testing can ensure:

- (1) the detection of persons with visual loss or impairment, for which testing of both eyes together is sufficient;
- (2) the detection of eyes with visual loss or impairment, for which each eye should be tested separately; and
- (3) the detection of visual loss or impairment due to refractive errors, for which pinhole testing may be useful.

When possible, the acuity of each eye should be tested separately, any corrective eyeglasses that are normally used being worn by the subject. One must be aware of the problem of untestability, which may lead to unnecessary referrals. When persons cannot be tested satisfactorily, this untestability should be recorded because it may influence the subsequent data analysis.

The levels and definitions of visual impairment and blindness given in the Ninth Revision of the International Classification of Diseases should be used (Table 1). Visual acuity should at least be tested for the levels which define the following categories: Snellen 6/18, 6/60, 3/60, and 1/60 (or their equivalent), and "no light perception". A more detailed subdivision of visual acuity categories may be utilized if desired.