

THE ROLE OF WHO IN BLINDNESS PREVENTION

G.B. Bietti¹

The World Health Organization's concern about the huge health problem posed by blindness is as old as the Organization itself. But it was the compilation of data on blindness for publication in WHO's *Epidemiological and Vital Statistics Report* in 1966 which made it possible for the broad global scene to be appreciated. Four years later, a questionnaire addressed by the Organization to its Member States made it possible to update this information and to submit it to the World Health Assembly convened in Geneva in 1972.

That Assembly recommended that all Member States should collate additional data on visual impairment and on blindness prevention, promote further interdisciplinary studies into the most effective and economic means of preventing blindness, initiate educational programs related to blindness, and step up technical assistance to national programs for blindness prevention.

Not the least of the problems in assessing the magnitude of the task ahead was that 65 different definitions of "blindness" had existed in different countries. But in 1972 a Study Group, in addition to laying down guidelines for the prevention of blindness, proposed a definition of loss of vision which should make it easier to compare the collected statistical data in the future.

The Extent of the Problem

An idea of the scale of this health problem can be obtained from the figures that follow, although it should be noted that the rates quoted here frequently apply to relatively narrow segments of the population or may be based on different criteria, and therefore are not strictly comparable with one another. In some regions and countries, the situation may have changed markedly since the figures were compiled.

Many African countries show a particularly high prevalence of blindness, one that is especially significant because a relatively high number of persons were examined. The prevalence in this region is most often between 150 and 300 blind per 100,000 inhabitants, but among the countries where it is higher are Ethiopia (380-450), Kenya (1,050-1,150), Malawi (724), Northern Nigeria (1,000), Northern Cameroon (684), Sierra Leone (952), Tunisia (450), Tanzania (569), Uganda (1,842), and Zambia (500-750). The majority of the causes of blindness are listed as "unknown" or "undetermined," but in Egypt and in South Africa, for instance, infectious diseases are cited as the first cause and accidents as the second.

For the Americas, the prevalence rates given range from 80-90 per 100,000 in Argentina and Uruguay to 969 in Cuba. In the United States it is 214, with a total blind population estimated at 385,000. Brazil and Mexico have a comparatively low prevalence, with 147 and 101 respectively, and respective blind populations of 60,700 and 16,880.

¹ President of the International Organization against Trachoma and Director of the Ophthalmological Clinic of the University of Rome, Italy.

Infectious diseases are cited as the most important cause of blindness in Central America, Venezuela, and Argentina, with hereditary and prenatal eye diseases in second place. Infectious diseases also occupy first place in Canada and the United States; accidents rank second in Mexico and the United States, third in Argentina and Canada.

A similar pattern is found in Asia, where infectious diseases rank as the first cause of blindness in practically every country except Japan; in the latter they occupy second place after accidents. Japan has reported a prevalence of 248 blind persons per 100,000 inhabitants. Across the Continent of Asia some of the highest prevalence rates have been recorded in Saudi Arabia (3,000), Yemen (4,000), Iraq (500-1,000), Pakistan (1,000), Sri Lanka (470), the Democratic Republic of Viet-Nam (428), Indonesia (239), China (450), and Hong Kong (1,392).

In Europe, the prevalence ranges between 51 in Belgium and 272 in Iceland (although it is as high as 647 in Gibraltar). Figures for some of the larger countries include the Federal Republic of Germany (60), France (107), Greece (170), Hungary (100), Italy (200), The Netherlands (50-60), Poland (66), Portugal (93), Spain (56), Romania (77), Sweden (196), Switzerland (145), England and Wales (209), and Yugoslavia (100). In the Soviet Union, 179,317 people out of over 200 million have been recorded as blind.

Of the European countries, only Malta ranks infectious diseases first among the causes of blindness. In general, hereditary and prenatal conditions rank first, closely followed by accidents, the latter occupying first place in Austria, Czechoslovakia, Denmark, the Federal Republic of Germany, Finland, and Italy.

In Oceania, Australia has 222 blind people for every 100,000 inhabitants and New Zealand 135. The Polynesian islands—with the exception of Fiji at 1,190—are below 145. In Australia and New Zealand hereditary, prenatal, and degenerative metabolic condi-

tions are the prime cause, followed at a considerable distance by infections and accidents.

It is almost impossible to make an acceptable estimate of the total number of blind people in the world, since percentages given in the statistics are mainly based on limited groups in each national community. However, figures derived from the WHO Questionnaire of 1970 showed that a total of 8.5 million people were recognized as blind. This was undoubtedly less than the true total, and a reasonable estimate of between 10 and 16 million blind people in the world would probably be closer to the mark.

Blindness in the Developing Countries

A sharp distinction can be made between the causes of blindness in the developing world and those in the more industrialized nations. Among the developing countries, the three great health problems which relate to eyesight are trachoma, onchocerciasis, and xerophthalmia.

Trachoma cases alone are estimated to number between 400 and 500 million around the world, including 120 million in India. Of these, around two million sufferers are blind. Onchocerciasis affects about 20 million altogether, but in the worst-affected area, the Volta River Basin of West Africa, no fewer than one million people out of a total population of ten million are victims; of these, 70,000 are blind. Xerophthalmia is a major cause of blindness in Indonesia, in some areas of India and other Eastern Asiatic countries, and in certain parts of Central America and Africa; it is believed that today at least 100,000 people are blind as a result.

WHO's interest in trachoma—a chronic infectious disease of the conjunctiva and cornea—dates from the late 1940's or virtually from the foundation of the Organization. Special sections were set up to deal with the problem, expert committees and study groups were convened, and several projects for the

fight against trachoma were started with the technical help of WHO experts and special advisers. Important support came from the United Nations Children's Fund (UNICEF) because children, especially, are affected.

Trachoma has been ranked anywhere from first to seventeenth among the communicable diseases in terms of the number of cases notified; but again, the notification of diseases is not uniform in the different countries. The Third WHO Committee of Experts on Trachoma concluded in 1961: "On the whole, in countries where the whole population is afflicted by trachoma and seasonal conjunctivitis, more than one per cent are totally blind, more than four per cent are economically blind (unable to perform any kind of work for which sight is needed), and more than ten per cent have serious impairment of vision."

Mass campaigns with antibiotics and the improvement of social and economic conditions have markedly reduced the severity of trachoma and of associated bacterial conjunctival infections in specific areas. In some zones the prevalence of blindness among trachoma patients has dropped to between one-fifth and one-twentieth of the rates recorded 15 to 20 years ago.

However, trachoma is still endemic today in most of North Africa and the Middle East, in wide areas of Asia, West and East Africa, and to a lesser degree in Latin America. Striking differences in the degree of endemicity and severity of the disease indicate a clear correlation with socioeconomic factors and living standards.

Onchocerciasis is a debilitating parasitic disease transmitted by the blackfly (*Simulium*) which, in sucking human blood, deposits a tiny worm, *Onchocerca volvulus*, within its victim's body. The worm starts reproducing at a prodigious rate, creating new generations of parasites (microfilariae) which are the cause of various skin lesions, and eventually of eye lesions which may lead to loss of vision. This disease is one of the most frequent causes of blindness in parts of

Western and Central Africa, and also affects areas of Central and South America (see pages 1 and 33).

A group of WHO experts concluded in 1968 that "onchocerciasis control is feasible with methods available at present, attacking with insecticides the larval stages [of the blackfly] in the breeding sites." Subsequently the seven most affected countries—the Ivory Coast, Ghana, Dahomey, Mali, Upper Volta, Niger, and Togo—joined together to fight this common enemy. They are being helped by four UN agencies—WHO, the United Nations Development Program (UNDP), the World Bank, and the Food and Agriculture Organization (FAO). Launched in January 1974, the program has already achieved positive results, although it is still too early to talk of controlling the disease.

Xerophthalmia, a term used here to embrace the three main ocular manifestations of vitamin A deficiency (hemeralopia, keratomalasia, and xerophthalmia) is closely related not only to low vitamin A (retinol) or provitamin A (carotene) intake, but also to infectious diseases of childhood, especially measles and diarrhea. In many areas protein-calorie malnutrition (PCM) is also associated with xerophthalmia, thus aggravating the clinical picture and the risks of blindness. To give one example, among blind children under 12 years of age in Java, xerophthalmia was found responsible for the condition in 75 per cent of the boys and 62 per cent of the girls.

A number of WHO-sponsored surveys and projects have shown that adequate vitamin supplies, even if administered only once or twice a year, or improved nutritional habits, can protect people—especially children—from this serious cause of blindness.

Blindness in the Industrialized Countries

Contrasting with the above, in the more developed countries of the world the most frequent causes of blindness are accidents,

glaucoma, diabetes and vascular diseases, cataract, and degeneration of the ocular tissues (especially the retina).

Glaucoma (a group of eye diseases characterized by increase in intraocular pressure resulting in defective vision) and diabetic retinopathy are not at present separately identified in WHO's statistical compilations of frequent causes of blindness, but the experience of many ophthalmologists indicates that these conditions play a very important role as causes of blindness in the developed countries, together with hereditary and degenerative conditions. Cataract (opacity of the eye's crystalline lens) becomes increasingly common with advancing age, but fortunately the operation required to reverse the condition is fairly simple in countries with well-organized medical services. Available information indicates that cataract tends to occur at a younger age in certain parts of the

world, and that large numbers of people go blind and remain blind unnecessarily, simply because adequate facilities are lacking.

A great many of the causes of blindness listed here lend themselves to prevention, whether by improving nutrition, by treating cases of infectious diseases, by controlling the organisms which cause infections, or by improving safety conditions—particularly on the roads, at work, or in the home. Hereditary conditions, which often play a part in visual impairment, can be prevented by skilled genetic counselling, and measures for early detection of glaucoma are increasingly attracting the attention of ophthalmologists at the individual and community level. However, the prevention of diabetic retinopathy and of vascular complications affecting the eye will require imaginative approaches calling for determined multidisciplinary efforts.