Global magnitude of visual impairment caused by uncorrected refractive errors in 2004

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Abstract Estimates of the prevalence of visual impairment caused by uncorrected refractive errors in 2004 have been determined at regional and global levels for people aged 5 years and over from recent published and unpublished surveys. The estimates were based on the prevalence of visual acuity of less than 6/18 in the better eye with the currently available refractive correction that could be improved to equal to or better than 6/18 by refraction or pinhole.

A total of 153 million people (range of uncertainty: 123 million to 184 million) are estimated to be visually impaired from uncorrected refractive errors, of whom eight million are blind. This cause of visual impairment has been overlooked in previous estimates that were based on best-corrected vision. Combined with the 161 million people visually impaired estimated in 2002 according to best-corrected vision, 314 million people are visually impaired from all causes: uncorrected refractive errors become the main cause of low vision and the second cause of blindness.

Uncorrected refractive errors can hamper performance at school, reduce employability and productivity, and generally impair quality of life. Yet the correction of refractive errors with appropriate spectacles is among the most cost-effective interventions in eye health care.

The results presented in this paper help to unearth a formerly hidden problem of public health dimensions and promote policy development and implementation, programmatic decision-making and corrective interventions, as well as stimulate research.

Bulletin of the World Health Organization 2008;86:63–70.

Une traduction en français de ce résumé figure à la fin de l'article. *Al final del artículo se facilita una traducción al español.* **الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة.**

Introduction

Refractive errors (myopia, hyperopia and astigmatism; presbyopia is not included in this study given the present paucity of data, but it is recognized that uncorrected, it could lead to an impaired quality of life) affect a large proportion of the population worldwide, irrespective of age, sex and ethnic group. Such refractive errors can be easily diagnosed, measured and corrected with spectacles or other refractive corrections to attain normal vision. If, however, they are not corrected or the correction is inadequate, refractive errors become a major cause of low vision and even blindness (for a selection of studies, see http://ftp.who.int/nmh/references/RE-estimates-references.pdf).

Visual impairment from uncorrected refractive errors can have immediate and long-term consequences in children and adults, such as lost educational and employment opportunities, lost economic gain for individuals, families and societies, and impaired quality of life. Various factors are responsible for refractive errors remaining uncorrected: lack of awareness and recognition of the problem at personal and family level, as well as at community and public health level; non-availability of and/or inability to afford refractive services for testing; insufficient provision of affordable corrective lenses; and cultural disincentives to compliance.

The definition of visual impairment in the *International statistical classification of diseases, injuries and causes of death, 10th revision* (ICD-10), H54, is based on "best-corrected" vision, i.e. visual acuity obtained with the best possible refractive correction.[1] However, to assess the extent of visual impairment caused by uncorrected refractive errors, estimates need to be based on "presenting" vision, i.e. visual acuity obtained with currently available refractive correction, if any. Thus, presenting vision, as opposed to best-corrected vision, provides the prevalence of visual impairment that could be improved simply by appropriate corrective refraction. Basing the definition of visual impairment on presenting vision extends the current definition to one that characterizes visual impairment faced by people in day-to-day activities.

Using best-corrected vision, visual impairment was estimated to affect 161 million people globally in 2002, of whom 37 million were blind.[2] The main cause of blindness and low vision was cataract; however, it was recognized that unless uncorrected refractive errors were included among the causes, visual impairment at global level was significantly underestimated.

This paper presents the estimate of the prevalence of visual impairment from uncorrected refractive errors for all ages over 5 years at regional and global levels, based on recent published and unpublished surveys. Some results from this paper were reported in a WHO press release on 11 October 2006 to mark World Sight Day.[3]

Methods

Definitions

Presenting vision is defined by the visual acuity in the better eye using currently available refractive correction, if any.

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doi:10.2471/BLT.07.041210
(*Submitted: 11 February 2007 – Revised version received: 28 May 2007 – Accepted: 11 June 2007 – Published online: 16 November 2007*)

Best-corrected vision is the visual acuity in the better eye achieved by subjects tested with pinhole or refraction.

Visual impairment caused by uncorrected or inadequately corrected refractive errors is defined as visual acuity of less than 6/18 in the better eye that could be improved to equal to or better than 6/18 by refraction or pinhole, thus spanning the low vision and blindness categories as currently defined in the ICD-10.

It should be noted that in the revision of the ICD-10 categories of visual impairment proposed in 2003 by a WHO consultation on the development of standards for characterization of vision loss, low vision is replaced by two categories: moderate visual impairment (presenting visual acuity less than 6/18 but equal to or better than 6/60) and severe visual impairment (presenting visual acuity less than 6/60 but equal to or better than 3/60).[4]

Table 1. **Surveys used to estimate global visual impairment from uncorrected refractive errors by WHO subregion, 2004**

WHO subregion[a,b]	Number of surveys	Countries
Afr-D	2	Mali, Mauritania
Afr-E	1	South Africa
Amr-A	3	United States of America
Amr-B	5	Argentina, Brazil, Chile, Paraguay, Venezuela (Bolivarian Republic of)
Amr-D	2	Guatemala, Peru
Emr-B	5	Iran (Islamic Republic of), Lebanon, Oman, Qatar
Eur-A	2	Ireland, Italy
Eur-B2	2	Armenia, Turkmenistan
Sear-B	6	Malaysia, Philippines, Singapore
Sear-D	13	Bangladesh, India, Nepal, Pakistan
Wpr-A	4	Australia
Wpr-B1	7	China
Wpr-B2	16	Cambodia, Myanmar, Viet Nam

[a] Afr, WHO African Region; Amr, WHO Region of the Americas; Emr, WHO Eastern Mediterranean Region; Eur, WHO European Region; Sear, WHO South-East Asia Region; Wpr, WHO Western Pacific Region.
[b] In subregions Emr-D, Eur-B1, Eur-C and Wpr-B3, no population-based surveys met the selection criteria.

Population estimates and WHO subregions

Estimates of population size and structure were based on the latest estimates of world population (for 2004) in the *World population prospects: the 2004 revision*; estimates of demographics were based on the *World urbanization prospects 2003* – both sources from the United Nations Population Division.[5,6]

For the classification of WHO Member States into 17 epidemiological subregions, see Murray & Lopez, 1996.[7]

General inclusion criteria

The following criteria were used to select studies.

- The prevalence of best-corrected and presenting visual acuity of less than 6/18 had to be reported or, alternatively, the distribution of causes of presenting visual impairment.
- In children, refractive diagnostics had to be determined by objective refraction under cycloplegia plus subjective refraction.[8]
- The studies had to be population-based, representative of the area sampled, with definitions of visual impairment clearly stated. Studies with inadequate sample sizes and response rate were not included.
- Data reported only for eyes or for the worse eye could not be included in the estimates calculated for people and the better eye.

For further discussion of selection criteria, see Resnikoff et al.,[2] and Pascolini et al., 2004.[9]

Sources of epidemiological data

Literature sources were searched systematically in Medline up to April 2006. Most surveys meeting the selection criteria were conducted within the past five years; the earliest surveys date from 1995. Unpublished data were provided by academic institutions and national programmes for the prevention of blindness.

Table 1 shows the 31 countries for which surveys that met the selection criteria were available, the bibliography can be found at http://ftp.who.int/nmh/references/RE-estimates-references.pdf and in the WHO Prevention of Blindness and Deafness Programme's global data on visual impairment.[10]

For the age group 5–15 years, 16 surveys were found to fit the selection criteria. Of these, 10 were conducted in different countries using a specially designed protocol to estimate the prevalence of visual impairment from uncorrected refractive errors (the refractive error study in children (RESC; see Négrel et al., 2000, for the details of the protocol).[11] The RESC studies provided extensive information on visual acuity, refractive errors and use of spectacles.

For the age group 50 years and older, 38 surveys met the inclusion criteria. Of these, 30 were surveys for the rapid assessment of cataract surgical services (RACSS), which also provide prevalence of presenting and best-corrected visual acuity.[12]

An additional 14 surveys reported age-specific prevalence of presenting visual impairment and its causes in other age groups.

Estimation of prevalence of visual impairment from uncorrected refractive errors

For the age group from 5 to 15 years, the prevalence is estimated by the difference between the prevalence of presenting and best-corrected visual acuity of less than 6/18 with refraction under cycloplegia: this difference corresponds to the prevalence of presenting visual acuity that could be improved to equal to or better than 6/18 by appropriate correction. In the case of studies reporting only the prevalence of presenting visual acuity, the prevalence of visual impairment due to refractive error was determined from the distribution of causes determined in the surveys.

The prevalence for people aged 16–39 years was estimated to be the same as that for those aged 5–15 years, on the assumption that from the ages of 16 years to 39 years, the refractive status generally does not undergo changes that require further correction.[13]

The prevalence for people aged 40–49 years was either estimated from

Table 2. **Number of people visually impaired from uncorrected refractive errors and corresponding prevalence, by age group and WHO subregion or country, 2004**

WHO subregion[a] or country	Age 5–15 years	Age 16–39 years	Age 40–49 years	Age >50 years	Total (5 to >50 years)	
	No. in millions (prevalence %)	No. in millions (prevalence %)	No. in millions (prevalence %)	No. in millions (prevalence %)	Population in millions	No. in millions (prevalence %)
Afr-D, Afr-E	0.534 (0.24)	0.683 (0.24)	0.647 (1.13)	4.529 (5.94)	640.4	6.393 (1.00)
Amr-A	0.501 (1.00)	1.098 (1.00)	0.810 (1.60)	3.417 (3.60)	305.4	5.826 (1.91)
Amr-B	0.709 (0.70)	1.331 (0.70)	0.998 (1.81)	3.204 (4.07)	432.4	6.242 (1.44)
Amr-D	0.137 (0.70)	0.209 (0.70)	0.127 (1.81)	0.486 (4.86)	66.4	0.959 (1.44)
Emr-B, Emr-D	0.405 (0.55)	0.688 (0.55)	0.356 (1.20)	1.708 (4.76)	264.3	3.157 (1.19)
Eur-A	0.516 (1.00)	1.379 (1.00)	0.991 (1.60)	5.289 (3.60)	398.3	8.175 (2.05)
Eur-B1, Eur-B2, Eur-C	0.721 (1.00)	1.740 (1.00)	1.065 (1.60)	3.335 (2.80)	431.7	6.861 (1.59)
Sear-B, Wpr-B1, Wpr-B2, Wpr-B3 (China excluded)	1.098 (0.79)	1.806 (0.74)	1.244 (1.70)	4.511 (4.67)	554.0	8.659 (1.56)
Sear-D (India excluded)	0.606 (0.63)	0.986 (0.73)	0.909 (2.39)	9.295 (19.45)	317.5	11.796 (3.71)
Wpr-A	0.034 (0.20)	0.097 (0.20)	0.039 (0.20)	1.177 (1.99)	144.4	1.347 (0.93)
China	5.940 (2.66)	14.414 (2.66)	7.209 (3.95)	26.903 (9.61)	1229.0	54.466 (4.43)
India	1.610 (0.63)	2.695 (0.63)	4.042 (3.39)	30.970 (18.70)	966.9	39.317 (4.07)
World	**12.811 (0.97)**	**27.126 (1.11)**	**18.437 (2.43)**	**94.824 (7.83)**	**5750.7**	**153.198 (2.67)**

[a] See Table 1, footnote a.

the results of surveys that reported age-specific data for this age group or calculated by a linear fit between the prevalence at age 39 and 55 years.

For the population aged 50 years and older, the prevalence was estimated from the difference between visual acuity of less than 6/18 with the available correction and visual acuity of less than 6/18 with best correction determined using refraction or pinhole, assuming that pinhole approximates complete refraction.

Estimation of prevalence of blindness from uncorrected refractive errors

Uncorrected refractive errors in adults aged 50 years and older have been shown to lead to blindness in some regions: the corresponding prevalence of blindness was determined from the difference between prevalence of presenting and best-corrected visual acuity of less than 3/60.

Blindness from uncorrected refractive errors was also reported in some surveys for the age group 40–49 years. Since there were insufficient data worldwide, it was assumed that the global number of people blind from this cause in this age group was 5.13 times lower than the corresponding number in people aged 50 years and over, based on the ratio of the total number of people visually impaired 50 years and over and those aged 40–49 years.

Estimation of refractive services coverage

The RESC studies also report the prevalence of uncorrected visual acuity in the age group 5–15 years: the prevalence of uncorrected, presenting and best-corrected visual acuity (VA < 6/18) provides an estimate of the percentage coverage of refractive services using the formula:

$$100 - \left[\frac{(\textit{presenting VA} - \textit{best corrected VA})}{(\textit{uncorrected VA} - \textit{best corrected VA})} \times 100 \right]$$

Since percentage coverage is based on presenting visual acuity, it is an estimate of both the provision of refractive services and the compliance to prescription.

Extrapolations

Since data were not available for every country, extrapolations were made to estimate the global prevalence of visual impairment from uncorrected refractive errors. The rationale for the extrapolations was the similarity of the epidemiology of refractive errors, the availability and/or affordability of refractive services and compliance. Various kinds of extrapolations were made, based on the data selected:

- the prevalence in urban and rural areas within a country was extrapolated to all urban and rural areas, respectively, of the country; the country prevalence was determined by weighting the prevalence by the rural–urban distribution of the population;
- in subregions with data from several countries, an average prevalence was determined and applied to all other countries in the subregion. The average was calculated by weighting the prevalence from the countries by their share of the population in the subregion and taking into account the urban and rural distribution of the population;
- in the case of whole subregions lacking data, the prevalence was extrapolated from other subregions with similar epidemiology of refractive errors and with similar WHO epidemiological classification.[6]

For China and India, estimates were made separately because of the population size. Some subregions estimated to have similar prevalence of visual impairment from uncorrected refractive errors and provision of refractive services were combined.

Results

Prevalence of visual impairment from uncorrected refractive errors by age and subregion

It is estimated that globally 153 million people over 5 years of age are visually impaired as a result of uncorrected refractive errors, of whom 8 million are blind. Table 2 shows the number of people in the WHO subregions with visual impairment from this cause and the corresponding prevalence by age. There is no evidence of visual impairment caused by uncorrected refractive errors in children aged less than 5 years.

From the data reported in surveys it was not possible to distinguish conclusively between the prevalence of male and female cases of uncorrected refractive errors for any of the age groups.

Some 12.8 million in the age group 5–15 years are visually impaired from uncorrected or inadequately corrected refractive errors, a global prevalence of 0.96%, with the highest prevalence reported in urban and highly developed urban areas in south-east Asia and in China.

The number of people aged 16–39 years visually impaired from uncorrected refractive errors is 27 million, a prevalence of 1.1% globally. This could, however, be an underestimate, being derived directly from the prevalence in the age group 5–15 years, although the prevalence of refractive errors, especially myopia, is higher between the ages of 13 and 18 years.

The prevalence in people aged 40–49 years globally is 2.45%; it is high in subregions or countries where the prevalence for people aged 50 years and older is also high. Almost 95 million people aged 50 years and older are visually impaired from uncorrected refractive errors: the prevalence is between 2% and 5% in most regions of the world, but is almost 10% in China and almost 20% in India and in Sear-D (WHO subregions defined in Murray & Lopez, 1996).[7]

Of the 95 million people aged 50 years and older visually impaired from uncorrected refractive errors, 6.9 million are blind (Table 3). Based on this, it is estimated that 1.3 million people in the age group 40–49 years are blind from uncorrected refractive errors. There was no evidence in any surveys of significant blindness in the age groups 5–15 years and 16–39 years.

Table 3. **Blindness from uncorrected refractive errors in adults aged 50 years and older, by WHO subregion or country, 2004**

WHO subregion[a] or country	Population type	Millions of adults >50 years blind from uncorrected refractive errors[b]
Afr-D, Afr-E	–	1.250 (1.64)
Amr-A	–	NRB
Amr-B	–	0.233 (0.3)
Amr-D	–	0.075 (0.75)
Emr-B, Emr-D	Rural	0.142 (0.95)
	Urban	0.084 (0.4)
Eur-A	–	NRB
Eur-B1, Eur-B2, Eur-C	–	NRB
Sear-B, Wpr-B2, Wpr-B3	–	0.319 (0.26)
Sear-D and Myanmar (India excluded)	–	0.834 (1.74)
Wpr-A	–	NRB
Wpr-B1 (China excluded)	–	0.032 (0.2)
China	Rural	0.528 (0.33)
	Urban	0.240 (0.2)
India	–	3.147 (1.9)
World	–	**6.884 (0.57)**

NRB, no reported blindness.
[a] See Table 1, footnote a.
[b] Figures in parentheses are prevalence percentages.

The average coverage of refractive corrections calculated from the RESC studies for visual acuity cut-off point of less than 6/18 is shown in Table 4.

Discussion

Limitations: uncertainties of the data and extrapolations

The sampling and examination methods in the RESC studies were designed to produce results that could be directly compared between countries: for presenting visual acuity of less than 6/18, the uncertainties given were between 20% and 25%. These uncertainties in turn affect the estimates for the age group 16–39 years, which are based on the results for the age group 5–15 years. The uncertainties reported in the RACSS studies are between 15% and 25% for the prevalence of visual acuity of less than 6/18; other studies reported uncertainties from 15% to more than 20%. In all the studies, the uncertainties become higher for the prevalence of visual impairment of less than 3/60.

The assumption that in adults the measurement of visual acuity with pinhole approximates the results obtainable with full refraction brings some additional bias to the estimates.[14]

Significant limitations are introduced by the need to extrapolate the prevalence and provision of services data from one rural or urban area to all rural and urban areas in a country or subregion, as well as from one country to other countries, or from one country to whole subregions. Some extrapolations could be particularly prone to error, as in the case of countries such as China or India, for which extrapolations are made for very large populations, or in the case of subregions with scarce data, such as Eur-B1, Eur-B2 and Eur-C (WHO subregions defined in Murray & Lopez, 1996).[7]

To check the consistency of the extrapolations, the estimates were verified using studies that did not fit the inclusion criteria due to the visual acuity ranges or the testing and reporting

methods used. Studies on the epidemiology of refractive errors have also been taken into consideration in all extrapolations.

The assumptions and extrapolations were reviewed by a group of independent experts convened by the WHO Prevention of Blindness Programme.[15]

Extent of visual impairment from uncorrected refractive errors worldwide

Uncorrected refractive errors are a major cause of blindness and low vision: it is estimated that 8 million people are blind and 145 million have low vision because of lack of adequate refractive correction (Table 5). The uncertainties associated with the data and the extrapolations can lead to overestimates as well as underestimates of these figures: if the uncertainties are estimated at 20%, the total of 153 million could vary from 123 million to 184 million.

The estimate of visual impairment caused by uncorrected refractive errors presented in this paper confirms that the problem is of public health concern, as emphasized previously.[16,17] This finding is significant considering that refractive errors could be easily diagnosed and that spectacle correction is among the most cost-effective interventions in eye care.

Global causes of visual impairment

If blindness and low vision from uncorrected refractive errors (this paper) and from all other causes (2002 estimate) are combined, 314 million people are visually impaired globally (Table 5). Uncorrected refractive errors are the second cause of blindness after cataract (Fig. 1) and the main cause of low vision: overall, they are the cause of almost half of all visual impairment.

Given the magnitude of the problem, uncorrected refractive errors need to be assessed and reported as a cause of visual impairment. It is expected that the ICD-10 definition of visual impairment will include, from the next revision in 2009, presenting vision along with the currently used best-corrected vision.

Table 4. **Estimated average coverage of refractive services for age group 5–15 years, by WHO subregion or country, 2004**

WHO subregion[a] or country	Population type	Coverage of refractive services for age group 5–15 years (%)
		Visual acuity <6/18
Afr-D, Afr-E	Rural and urban	30
Amr-A	–	–
Amr-B, Amr-D	Rural	30
	Urban	45
Emr-B, Emr-D	Rural	45
	Urban	80
Eur-A	–	–
Eur-B1, Eur-B2, Eur-C	–	–
Sear-B, Sear-D, Wpr-B1, Wpr-B2, Wpr-B3 (China and India excluded)	Rural	30
	Urban	55
	Most developed urban	80
Wpr-A	–	–
China	Rural	45
	Urban	85
	Rural, 13–17 years	70
India	Rural	30
	Urban	55

[a] See Table 1, footnote a.

Reasons why refractive errors remain uncorrected

In the age group 5–15 years, non-correction of refractive errors is due to several factors: the lack of screening, and the availability and affordability of refractive corrections are the most important. However, cultural disincentives also play a role, as shown in surveys from countries where routine screening and provision of corrections are free of charge or easily accessible, but compliance remains low (S Wedner, unpublished observations, 2006).[18,19] Perhaps one of the most remarkable findings in this study is that even in economically advantaged societies, refractive errors can go undetected or uncorrected in children.[20]

The estimated number of people aged 50 years and older visually impaired from uncorrected refractive errors is over 94 million, a figure that could be an underestimate, being based in part on studies that used only pinhole in place of full refraction.[14] In countries where the prevalence is very high, important underlying causes are index myopia caused by cataract, uncorrected aphakia and insufficient intra-ocular lens correction.[21,22] This is particularly true in rural areas.

For the age group 5–15 years, the prevalence of visual impairment from uncorrected refractive errors in some regions appears to be higher in urban areas than in rural areas, despite the reported better access to services. This may be due to a high incidence of myopia in these populations: it is suggested that there may be a direct cause–effect relation between increased access to

Table 5. **Global estimate of number of people visually impaired, 2004**

Category of impairment	Number of people visually impaired (in millions)		
	from uncorrected refractive errors	from all other causes, 2002 estimate[a]	from all causes
Blind	8.226	36.857	45.083
Low vision	144.972	124.264	269.236
Visual impairment	**153.198**	**161.121**	**314.319**

[a] These estimates were based on best-corrected visual acuity and the population in 2002: the global population change from 2002 to 2004 is estimated to be around 3%.

education and myopia, but other secular changes could be contributing factors. In this age group the prevalence of myopia reported in studies that used the same definitions and cut-off levels ranges from 3% to 35%, hypermetropia from 0.4% to 17%, astigmatism from 2.2% to 34% depending on the region and on the urban/rural setting.

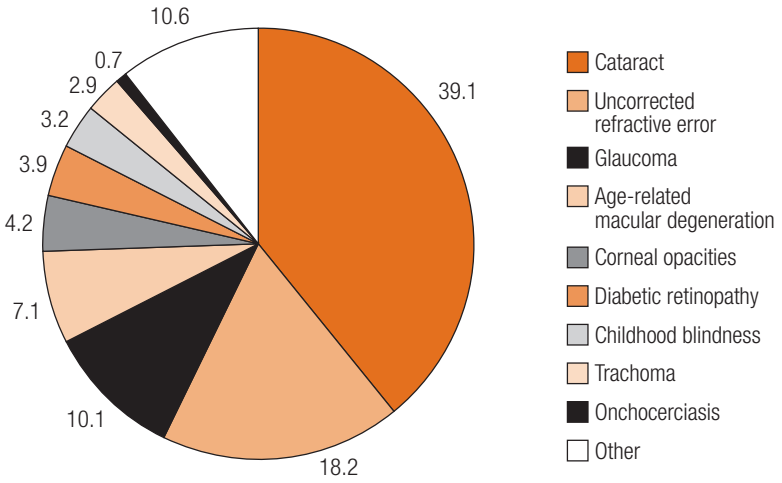
The coverage of refractive corrections determined from the RESC studies is less than or around 50% in most regions of the world; urban areas have, as expected, better service coverage than rural areas (Table 4).

Conclusions

These findings warrant the urgent implementation of the following fundamental policies.

- Screening of children for refractive errors should be conducted at community level and integrated into school health programmes, accompanied by education and awareness campaigns to ensure that the corrections are used and cultural barriers to compliance are addressed and removed.
- As the cost of refractive corrections is still high compared with the personal and family resources in many regions, corrections must be accessible and affordable for people of all ages.
- Eye-care personnel should be trained in refraction techniques. Training and information programmes should also be designed for teachers and school health-care workers.

Fig. 1. **Global causes of blindness as a percentage of total blindness, 2004**



- Reliable and affordable equipment for refractive assessments should be developed.
- Refraction services need to be integrated with eye-care systems and included as a part of cataract surgery services.
- Impairment from uncorrected refractive errors, provision of refractive services and outcomes of the provisions should be monitored at national level to identify communities in need and evaluate the most cost-effective interventions.

Another aspect of visual functioning that has not been discussed in this paper is near vision: the unmet need of correction of presbyopia is currently unknown and should be assessed and included in future estimates of visual impairment. ■

Acknowledgements

The authors would like to acknowledge the contribution of the WHO Refractive Errors Working Group. This study was supported financially by a grant from the World Optometry Foundation of the World Council of Optometry. Particular appreciation is due to all experts from around the world who have generously provided survey reports, journal articles and unpublished results.

Competing interests: None declared.

Résumé

Prévalence mondiale des déficiences visuelles dues à des défauts de réfraction non corrigés en 2004

Des estimations mondiales et régionales pour l'année 2004 de la prévalence des déficiences visuelles dues à des défauts de réfraction non corrigés chez les plus de 5 ans ont été établies à partir d'enquêtes récentes publiées et non publiées. Ces estimations ont été obtenues d'après la prévalence d'une acuité visuelle inférieure à 6/18 pour le meilleur des deux yeux avec la correction réfractive actuellement disponible, susceptible d'être ramenée à une valeur supérieure ou égale à 6/18 par une correction réfractive ou un trou sténopéique.

On estime à 153 millions (plage d'incertitude : 123 à 184 millions) le nombre total de personnes souffrant d'une déficience visuelle due à un défaut de réfraction non corrigé, dont huit millions d'aveugles. La cause de la déficience visuelle a été laissée de côté dans les estimations antérieures reposant sur la meilleure vision corrigée. Si l'on combine ce chiffre à l'estimation de 2002 du nombre d'individus déficients visuels établie d'après la meilleure vision corrigée, 314 millions de personne présentent une déficience visuelle toutes causes confondues, les défauts de réfraction non corrigés devenant la principale cause de mauvaise vision et la seconde cause de cécité.

Les défauts de réfraction non corrigés peuvent nuire aux résultats scolaires, réduire la capacité à occuper un emploi et la productivité et, de manière générale, détériorer la qualité de vie. La correction des défauts de réfraction par des lunettes adaptées reste l'intervention la plus rentable en termes de soins ophtalmologiques.

Les résultats présentés dans cet article contribuent à faire ressortir un ample problème de santé publique formellement masqué, à favoriser le développement et la mise en œuvre de politiques, ainsi que la prise de décisions programmatiques et de mesures correctives, et à stimuler la recherche.

Resumen

Magnitud mundial de las discapacidades visuales por defectos de refracción no corregidos en 2004

Se ha estimado la prevalencia de las discapacidades visuales causadas por los defectos de refracción no corregidos en 2004 a nivel regional y mundial en la población de 5 o más años a partir de encuestas recientes publicadas o inéditas. Las estimaciones se basaron en la prevalencia de una agudeza visual inferior a 6/18 en el mejor ojo con la corrección refractiva del momento, pero mejorable hasta 6/18 o más con medidas de corrección de la refracción o con un agujero estenopeico.

Se estima que un total de 153 millones de personas (intervalo de incertidumbre: 123 - 184 millones) sufren discapacidad visual como consecuencia de defectos de refracción no corregidos, incluidos ocho millones que padecen ceguera. Esta causa de discapacidad visual no se ha tenido debidamente en cuenta en estimaciones anteriores basadas en la mejor visión corregida. Si se suman a ello los 161 millones de personas con discapacidad visual estimados en 2002 de acuerdo con el criterio de la mejor visión corregida, se obtiene un total de 314 millones de personas con discapacidad visual por todas las causas: los defectos de refracción no corregidos se convierten así en la principal causa de disminución de la agudeza visual y la segunda causa de ceguera.

Los defectos de refracción no corregidos pueden reducir el rendimiento escolar, la empleabilidad y la productividad, y por lo general merman la calidad de vida. Sin embargo, la corrección de esos defectos con unas gafas apropiadas es una de las intervenciones más costoeficaces de la atención oftalmológica.

Los resultados aquí presentados pueden contribuir a hacer aflorar un problema hasta ahora oculto de gran trascendencia en el campo de la salud pública, y promover la formulación y ejecución de políticas, la toma de decisiones programáticas, las intervenciones correctivas y la realización de investigaciones en ese terreno.

ملخص

العبء العالمي لضعف الرؤية الناجم عن الأخطاء الانكسارية غير المصححة في عام 2004

تم تقدير مدى انتشار ضعف الرؤية الناجم عن الأخطاء الانكسارية غير المصححة على المستويين الإقليمي والعالمي، لدى من هم في عمر خمس سنوات فأكثر، وذلك من واقع المسوحات الحديثة المنشورة وغير المنشورة. وقد استندت هذه التقديرات إلى مدى انتشار حدة الإبصار التي تقل عن 18/6 في العين الأفضل في الرؤية باستخدام وسيلة تصحيح الانكسار المتاحة، والتي أمكن تحسينها إلى مستوى 18/6 أو أفضل عن طريق تصحيح الانكسار أو الرؤية من خلال الثقوب الصغيرة.

وبينت الدراسة أن 153 مليون شخص (نطاق عدم الثقة تـراوح من 123 إلى 184 مليوناً) مصابون بضعف الرؤية بسبب الأخطاء الانكسارية غير المصححة، منهم 8 ملايين مصابون بالعمى. وقد أغفل هذا السبب في التقديرات السابقة التي استندت إلى أفضل رؤية بعد التصحيح. وبالإضافة إلى المصابين بضعف الرؤية المقدر عددهم بـ 161 مليوناً في عام 2002، وفقاً لأفضل رؤية بعد التصحيح، هنالك 314 مليوناً مصابون بضعف الرؤية الناجم عن جميع الأسباب: وتُعد الأخطاء الانكسارية غير المصححة المسبب الرئيسي لضعف الرؤية، والمسبب الثاني للعمى.

ومن شأن الأخطاء الانكسارية غير المصححة أن تعوق الأداء في المدارس، وأن تقلل من الإنتاجية والقدرة على الالتحاق بالوظائف، وأن تضعف نوعية الحياة بشكل عام. ويُعد تصحيح الأخطاء الانكسارية بالنظارات المناسبة أحد أفضل التدخلات العالية المردود في الرعاية الصحية للعيون.

وتساعد النتائج الواردة في هذه الورقة على كشف النقاب عن مشكلة ذات أبعاد صحية، وتعزيز إعداد السياسات وتنفيذها، واتخاذ القرارات البرنامجية، والقيام بالتدخلات التصحيحية المناسبة، إضافة إلى تنشيط البحوث.

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