CONSULTATION ON DEVELOPMENT OF STANDARDS FOR CHARACTERIZATION OF VISION LOSS AND VISUAL FUNCTIONING

Geneva, 4-5 September 2003

CONTENTS

1. INTRODUCTION

The World Health Organization and the National Eye Institute, National Institutes of Health (USA), have renewed the contract "Strengthening of the WHO Programme for the Prevention of Blindness" for three years – from 1 April 2002 to 31 March 2005.

Under this renewal, the partnership between the National Eye Institute and the WHO Programme for the Prevention of Blindness and Deafness (PBD) will be further strengthened in a defined consultation process and agreement on work activities. The three tasks included in the current renewal represent priority issues for health policy and delivery of eye care that are of mutual interest to both institutions. This is of particular significance in the context of the new WHO-led Global Initiative for the Elimination of Avoidable Blindness, launched in February 1999 under the caption "VISION 2020 – The Right to Sight".

The three contract tasks deal with the following broad topics:

1. Assessment of eye care delivery services and blindness prevention programmes
2. Studies of visual impairment and refractive error in school-age children
3. Capacity-building for implementation and evaluation of programme development

A Consultation on the development of these topics was thus held at the World Health Organization headquarters, from 4 to 5 September 2003. The list of participants is contained in Annex 1. The draft agenda was adopted with no modification (Annex 2). Dr Astrid Fletcher was elected Chairperson, and Dr Terry Cox Rapporteur.

Regarding the scope and purpose of the meeting, task 3 included a review and a possible revision of the WHO definitions used for the categorization of vision loss and blindness, this topic to be fully addressed and appropriate recommendations developed. The following areas were to be reviewed:

- The existing WHO definitions/classification of vision loss and blindness
- Blindness disability weights as used in WHO Global Burden of Disease assessments
- The various functional dimensions of severity of visual impairment
- Visual acuity and visual field measurement standards
- Issues in the characterization of visual acuity loss in population surveys and clinical research with special reference to presenting/best-corrected visual acuity
- The International Council of Ophthalmology report and resolution on vision loss categorization
- Methods for the subjective assessment of visual functioning as reported by the individual
- The relationship between visual acuity and visual functioning based on population-based data from surveys in China, India and the United States of America

The expected outcomes of the meeting were (1) consensus development on methods of measurement and reporting of vision, the proposed revision of the WHO classification of severity of visual impairment in (*International Classification of Diseases*) ICD–10 and (*International Classification of Functioning*) ICF-2000, and an instrument for assessment of subject-reported visual functioning; and (2) identification and prioritization of relevant research needs.

2.   PROCEEDINGS

2.1   Drs Resnikoff and Pokharel reviewed the *scope, purpose and expected outcomes* of the meeting as outlined above.

2.2   Dr Pararajasegaram reviewed the *history of development of elements in ICD-10 and ICF-2000*. The current classification of visual impairment dates back 30 years. It was proposed in 1972 by a WHO Study Group on the Prevention of Blindness and included in the Ninth Revision of ICD in 1975. Considerable experience has been gained in its use around the world, in different settings. Some shortcomings have been identified that need to be addressed, with a consensus reached on any desired changes.

Dr Pararajasegaram identified the following issues for consideration:

- Best corrected vision does not indicate the real-life situation and underestimates the burden of visual impairment.
- The term "low vision" has another connotation in relation to those requiring low vision services, and not all persons in the currently defined low vision category are candidates for low vision care.
- The cut-off point for "blindness" may limit the number of persons who require services, as many are "economically" blind long before they reach the currently defined "blindness" level.
- The practical importance of visual field considerations in the categorization of visual impairment.
- Standardization of visual acuity measurement, including near vision measurement.

Dr Pararajasegaram also discussed the *International Classification of Impairments, Disabilities and Handicaps* (ICIDH) and referred to ICF–2000. This was a manual of classification which went beyond ICD and considered issues related to the consequences of disease. It went from the *etiology* $\rightarrow$ *pathology* $\rightarrow$ *manifestation* paradigm to *disease* $\rightarrow$ *impairment* $\rightarrow$ *disability* $\rightarrow$ *functioning*.

2.3   Dr Chatterji described the process of *revising ICD–10 and ICF-2000*. He also described the sections on vision of ICD–10. He described the ICF and its relationship to the ICD.

2.4   Dr Shibuya discussed *GBD (Global Burden of Disease) disability weights – methodological issues and recent developments*. In the current system (GBD-1990), disability weights on blindness are based on the decompositional description and valuation made by experts, not on subject-based research.

Through standardized multidimensional description of health states and multimethod valuation from the general public, it is now possible to assess variation across different types of respondents and different settings. GBD-2000 will be derived using state-of-the-art research and statistical analyses to map functioning from domain levels to valuation, after correcting for systematic bias in self-reported data from different populations.

2.5   Dr Holden reviewed the various clinical tests that are used to characterize visual loss (*quantitative characterization of the clinical dimensions of vision loss: visual acuity; visual fields; colour vision; contrast sensitivity; light/dark adaptation; stereopsis*). He described various methods for measuring and reporting visual acuity and emphasized the advantages of logMAR charts. He also described classification and measurement of colour vision deficits, contrast sensitivity, dark adaptation, and stereopsis. He emphasized the need for further research to understand the relationship between these aspects of visual function and visual disability.

2.6   Dr Zadnik described the clinical ***measurement of visual acuity*** in detail. She emphasized that measurement techniques (for example chart distance and illumination) should be standardized, that instructions to patients should be uniform and that training and certification of examiners was essential. She described in detail the logMAR charts (Bailey-Lovie, ETDRS) that are currently in use in clinical visual research.

2.7   Dr Hyvärinen discussed ***visual assessment in children***. She described the assessment of visual disability in children, including the documentation of techniques required by children with visual dysfunction to perform various tasks. She also discussed the difficulties in assessing children with multiple disabilities and emphasized the utility of low contrast acuity as a measure of visual function.

2.8   Dr Varma discussed ***standards for classification of visual ability based on measurement of visual fields***. He described standards used by the United States Social Security Administration, presented in the publication *Visual impairments: determining eligibility for social security benefits* (National Academies Press, 2002). This publication is a report of the Committee on Disability Determination for Individuals with Visual Impairments, of the National Research Council. Dr Varma described current standards that are based on Goldmann perimetry and the standards based on automated perimetry that are recommended by this Committee. Dr Varma noted that these standards apply to visual fields measured with either eye open, not with both eyes open.

2.9   Dr Ellwein discussed the relationship between clinical measurements of vision and visual functioning, disability-adjusted life years (DALYs) and disability weights. He described the different ***characterizations of visual impairment*** in populations when definitions are based on presenting ***visual acuity*** (obtained with currently available refractive correction, if any), best-corrected visual acuity and unaided visual acuity (no refractive correction).

    He concluded that:

- both eyes are relevant in disability weight and visual function questionnaire assessments. Visual acuity in both the better and the worse eye is needed, in order fully to characterize visual status;
- presenting (not best-corrected) visual status underlies disability weight and visual function assessments; prevalence data should also be based on presenting acuity;
- the relationships between disability weights and visual acuity and between prevalence and visual acuity provide no evidence for visual acuity cut points; categorization of visual acuity is artificial.

2.10   Dr Cox discussed statistical aspects of ***measurement of visual function in clinical research***. He suggested that categorization of visual outcomes is generally undesirable and noted the complexity of analysis of visual field data and the need for further research in this area.

2.11   Regarding ***proposed vision loss categorization***, Dr Colenbrander discussed the document "Visual standards: aspects and ranges of vision loss", prepared for the International Council of Ophthalmology (ICO) and adopted at the 29th International Congress in Sydney, in April 2002.

2.12   Dr Fletcher discussed patient-centred outcomes in ophthalmology and their *measurement with questionnaires*, including the VF-14, the NEI-VFQ and the Indian Visual Function Assessment Questionnaire (IND-VFQ). She described the development and evaluation of the last instrument in detail and concluded that:

- vision-related quality of life is a more valid measure of the impact of poor vision on the individual than visual acuity;
- visual acuity explains only between 20% and 30% of variance in vision-related quality of life;
- vision-related quality-of-life studies demonstrate the importance of considering vision in both the better and the worse eye.

2.13   The *relationship between visual acuity loss and visual functioning* was discussed:

China surveys: Dr Jialiang presented results of three large population surveys at different sites in China. All subjects underwent visual acuity testing and eye examinations, and a subset filled out a visual functioning questionnaire. Of particular interest in comparing results of these surveys was that mean scores on the questionnaire varied considerably between sites.

United States surveys: Dr Varma described the Latino Eye Study in Los Angeles and presented the results of a comparison of NEI-VFQ and visual acuity outcomes. He noted that visual acuity with both eyes open (BEO) often differed from better eye acuity; in 22% of subjects BEO acuity was better, and in 2% of subjects BEO was worse. He also described the evidence that co-morbidity and depression influence NEI-VFQ scores independently of visual function.

CONCLUSIONS AND RECOMMENDATIONS

Three working groups met to discuss the main topics of the Consultation and presented their recommendations to the group as a whole, for further discussion and consensus development. The members of these working groups are listed in Annex 3.

I.   Methods of vision assessment (*Working Group 1*)

I.1   *It was recommended* that vision assessment in population-based studies include:

- measurement of visual acuity using logMAR charts (with logarithmic progression) at distance and near under standardized conditions and using the protocol outlined below;
- assessment of ocular motility by the cover test.

I.2   For a population-based vision assessment study, *it was recommended* that the suggested tests and sequence for visual acuity testing be the following:

- Record monocular and binocular distance presenting visual acuity using logMAR charts, whether a method of vision correction is used (e.g. spectacles) and, if so, the type and power of vision correction device.
- Monocular and binocular near presenting visual acuity at 40 cm using logMAR charts, whether a method of vision correction is used (e.g. spectacles) and, if so, the type and power of vision correction device.
- Monocular and binocular best-corrected visual acuity at distance and near, following refraction using an age-appropriate addition for near.

Visual acuity testing

I.3   Charts: *It was recommended* that the logMAR chart design (as originally described by Bailey-Lovie) be used for all visual acuity testing at both distance and near.

I.4   Contrast levels: *It was recommended* that high-contrast charts be used. Although contrast sensitivity gave much useful information about visual function, it was considered impractical for population-based studies. Low-contrast visual acuity charts could provide useful additional information, especially where conditions such as cataract, glaucoma, optic neuritis, etc., were likely to occur; but these charts were not yet recommended for population-wide assessments until data were obtained indicating the specific added value of low-contrast visual acuity in population studies.

I.5   Lighting: For high-contrast letter charts, *it was recommended* that chart luminance be at between 80 cd/m^2 and 160 cd/m^2 and that there be >80% contrast between optotype and background.

I.6   Test distances: 6 m *was recommended* for distance visual acuity and 40 cm for testing near visual acuity. Alternatives had been suggested in some circumstances, for example 4 m test distance for convenience in certain settings, or 3 m for children aged 2-5 years; but to minimize accommodation and ensure comparability of studies, 6 m was still considered the standard.

I.7 Optotypes: *It was recommended* that:

- there be 5 Bailey-Lovie or equivalent logMAR optotypes per row;
- the space between the optotypes in a row be at least as wide as the optotypes in that row;
- the size of optotypes change by 0.1 log unit steps between rows;
- letters, numbers, tumbling Es, and symbols were acceptable optotypes; that comparability studies be done to provide information on differences in measured outcomes using different optotypes, recognizing also that when tumbling Es were used in charts with 5 letters per line there was a 1 in 10 chance of getting three or more orientations correct on a given line by chance alone;
- similar optotypes (e.g. letters or symbols) be used for both distance and near.

I.8 Protocol: *The recommended protocol* was as follows:

- Line-by-line isolation or pointing may be used, but not letter by letter.
- Threshold should be obtained by asking the person to read all optotypes from the top of the chart until a line is missed. Although reading every optotype from the top is the standard, alternatives can be used, but comparability needs to be researched. For example, with children it may be less tedious to ask the child to read the first optotype on the left-hand side of each line until one is missed and then go back up one line and read across.
- Stopping rule: Once a person has started a line, he or she should finish by guessing at all 5 letters on that line. Once at least three letters are missed on a line and all letters on that line have been attempted, then the person has completed that visual acuity measure.
- Pre-training of the persons who are having their vision assessed is essential to ensure that the test is understood.
- Recording acuity: LogMAR is the base 10 logarithm of the inverse of the Snellrn fraction. For example, $logMAR(20/200) = log_{10}(200/20) = log_{10}(10) = 1.0$. The logMAR acuity is the letter size of the smallest line on which the person reads 3 or more letters plus 0.02 for each letter missed on that line. For example, if all the letters or optotypes are identified correctly on the line above the 20/20 or 6/6 line and 3 letters on the 20/20 or 6/6 line are read correctly, then the visual acuity would be recorded as $0.0 + 2 \times 0.02 = 0.04$ logMAR. A less preferable and less accurate alternative is to record the acuity based on the last line on which 3 or more letters are correctly identified – in the case mentioned, the visual acuity would be 0.0 logMAR.

I.9 Issues related to examiners and testing procedures: *The following recommendations were made*:

- Regular training was recommended for those administering visual acuity tests, as the skill of the tester affects very significantly the validity and variability of the outcome.
- Culture-specific communication skills were needed both to select the right type of optotype and to ensure consistent administration of the test.
- Quality control: Continuing assessment of examiners, test-retest repeatability, quality of the charts, etc., was needed to maximize consistency of results.
- To create capacity, it was most effective to train local eye care personnel in visual acuity testing.
- Information needed to be made available on (i) the comparability of logMAR visual acuity testing with previously obtained Snellen acuities, and (ii) the cost and availability of both distance and near vision logMAR charts.

Binocularity

I.10 A cover test at distance and near *was recommended* to assess presence, direction and magnitude of any heterotropia.

Other comments

- Pinhole: Monocular distance pinhole visual acuity testing is useful when normal facilities are not available for ocular assessment and may rule out some cases of eye disease.
- Special population groups: For special groups such as people with low vision, a more extensive assessment of visual function at near is appropriate. All visual acuity estimates rely to some extent on the person's ability to respond. In populations where persons are unable to respond adequately, objective tests like retinoscopy provide an estimate of refractive error and could optimize vision for such persons. Ophthalmoscopic evaluation would also be of value in predicting vision.
- Uncorrected visual acuity may be useful in some circumstances.
- The use of +2.00 D spectacles for distance visual acuity testing has been found to be useful in detecting hyperopia in children.
- Near visual acuity with both eyes open at whatever near distance maximizes that near acuity may be useful to detect highly myopic persons.

Tests discussed but not included

- Contrast sensitivity and contrast visual acuity charts
- Visual fields: Automated perimetry is the recommended standard. Where it cannot be performed, confrontation can detect gross field defects. More work needs to be done to develop good methods for testing visual fields in population surveys.
- Colour vision: Colour vision is important in vocational advice, for safety in severe red-green defects and in detecting disease processes (acquired colour vision defects), but is not recommended for population-based assessment of vision.
- Dark adaptation: Diminished dark adaptation can be an early sign in conditions such as vitamin A deficiency and retinitis pigmentosa.
- Binocularity (stereopsis, coordination, suppression, oculomotor function)
- Objective measures of visual function for those unable to respond (e.g. electrophysiology, retinoscopy, ophthalmoscopy): These tests have a role in evaluating vision when the person being tested cannot communicate. There is, however, no suitable equipment for use in population-based vision assessment.
- Motion perception: Testing of motion perception can be valuable in some clinical and research settings.
- Quality of vision – subjective descriptions: Subjective ratings of haze, haloes, starbursts, monocular diplopia, ghosting, distortion, etc., can be useful indicators of decrements in vision quality.

II.   Proposed revision of WHO classification and definitions (*Working Group 2*)

The current categorization of vision loss as included in ICD–10 is based on the recommendations of a WHO Study Group on Prevention of Blindness, in 1972, and was included in the Ninth Revision of ICD in 1975. Several representations have been made to WHO/PBD with regard to the need to review and amend the classification based on experience in the field and in clinical practice. The representations include a resolution on the subject adopted by the International Council of Ophthalmology, representing the International Federation of Ophthalmological Societies, in 2002.

The suggested amendments pertain largely to the issues of "best-corrected visual acuity" versus "presenting visual acuity" and to making the visual acuity cut-off points for visual impairment and blindness flexible, for adaptation by countries as they deem appropriate. The currently existing classification is shown below:

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

II.1 *The participants recommended* that the categories of visual impairment and the codes for blindness and low vision in ICD–10 be modified as presented in the following table:

Table 1. Proposed revision of categories of visual impairment

Category	Presenting distance visual acuity	
	Worse than:	**Equal to or better than:**
Mild or no visual impairment 0		6/18 3/10 (0.3) 20/70
Moderate visual impairment 1	6/19 3.2/10 (0.3) 20/63	6/60 1/10 (0.1) 20/200
Severe visual impairment 2	6/60 1/10 (0.1) 20/200	3/60 1/20 (0.05) 20/400
Blindness 3	3/60 1/20 (0.05) 20/400	1/60* 1/50 (0.02) 5/300 (20/1200)
Blindness 4	1/60* 1/50 (0.02) 5/300 (20/1200)	Light perception
Blindness 5	No light perception	
9	Undetermined or unspecified	

* Or counts fingers (CF) at 1 metre.

II.2 The categories of visual impairment and the codes for blindness and low vision in ICD-10 (see Appendix) should be defined as presented in Table 1. For characterizing visual impairment for codes H54.0 to H54.3, visual acuity should be measured with both eyes open with presenting correction if any. For characterizing visual impairment for codes H54.5 to H54.7, visual acuity should be measured monocularly with presenting correction if any.

Currently, category 1 visual impairment requires visual acuity worse than 6/18. The group considered the desirability of changing this to visual acuity worse than 6/12. There were research studies pointing to a rationale for such a change; however, these studies were done in developed countries and might not be globally representative. *It was recommended* that (i) analysis of existing data from developing countries be undertaken, and (ii) when necessary, similar studies be carried out in developing countries, to provide additional evidence.

III. **Subjective assessment of visual functioning and disability weights** (*Working Group 3*)

III.1 The World Health Organization defines health as a state of complete "physical, mental and social well-being", not merely the absence of disease or infirmity. This perspective suggests that the assessments of the effectiveness of eye care and prevention of blindness initiatives should go beyond those based only on traditional clinical data. Clinical measurements, such as visual acuity, provide an indication of the degree of vision loss, but do not provide an adequate characterization of the visual disability faced by the visually impaired person in day-to-day activities. Accordingly, ***the group recommended*** that cross-cultural methods for assessing visual functioning and vision-related quality of life should receive increased attention as a complement to clinical assessments.

III.2 The group noted that means for obtaining patient-reported assessments had received considerable development in recent years. A visual function/quality of life questionnaire, developed specifically for the Madurai Intraocular Lens Study, had been administered in China, Hong Kong, India and Nepal. This instrument had provided unprecedented cross-cultural information on the relationship between visual acuity and visual functioning. A second, more general, visual functioning instrument (IND-VFQ-33) had been developed in India in a multi-institution effort that replicated the rigorous psychometric methodology used in developing the widely used NEI-VFQ-25. In preparation for the consultation, Drs Ellwein and Fletcher had reviewed the content of the IND-VFQ-33, along with the NEI-VFQ-25 (and other instruments), in proposing for consideration a 20-item Visual Functioning Questionnaire. This VFQ-20 (attached) addressed the following dimensions of visual functioning: general vision, distance vision, near vision, colour vision, role limitations, glare, light/dark adaptation, ocular pain/discomfort, social functioning, mental well-being, and dependency. ***The group recommended*** that this proposed instrument be subjected to validation in a suitable field-test(s). Field-test data should incorporate a multivariate analysis of the association of questionnaire responses with the age, gender and socioeconomic status of the respondents, as well as their near and distance binocular presenting visual acuity. It was also suggested that consideration be given to including a general health question, a co-morbidity query and a brief cognitive assessment in elderly subjects.

III.3 The group also noted that the assessment of disability weights for use in WHO Global Burden of Disease studies required further development, particularly in obtaining disability weights across the entire visual impairment/blindness range. ***It was recommended*** that the methods developed for the ongoing WHO World Health Survey be followed in conducting assessments in representative samples of patients – representative in terms of age, gender and socioeconomic status, as well as the visual impairment/blindness range. The WHO methodology uses a five-category difficulty scale in asking patients to rate the difficulty/disability associated with their own visual status, along with that of standard vision vignettes. Four vignettes (attached) derived from the WHO World Health Survey, representing different levels of distance visual acuity, were suggested by the group: 6/9-6/12; 6/24-6/36; 6/60-3/60; and NLP. The administration of standard vignettes was an important part of the methodology in that it allowed for cross-cultural calibrations of cut points used in the categorical responses to the difficulty question posed for each vision vignette. The final component of the methodology dealt with the actual assessment of disability weights for each of the vision vignettes and the respondent's own vision state. Subjects were asked to rank each of the vision states, including their own, and to rate them using a 0 to 100 analogue scale – where 0 indicates a state that is as undesirable as death, and 100 indicates the most desirable vision state.

III.4 ***The group recommended*** that WHO/PBD seize the earliest opportunity to conduct both visual functioning and disability weight assessments.

ATTACHMENT: Proposed WHO/PBD Visual Functioning Questionnaire (20 item)

The first questions are about your overall eyesight. I will read out a choice of five answers and you will choose the one that describes you best.

		1.Very good	2. Good	3. Moderate	4. Bad	5. Very bad
1	Overall, how would you rate your eyesight using both eyes – with glasses or contact lenses if you wear them?					
2	How much pain or discomfort do you have in your eyes (e.g. burning, itching, aching)?	1. None	2. Mild	3. Moderate	4. Severe	5. Extreme

(NOTE: If the responses were "Very good" and "None" to the above two questions, END the interview.)

In the next section, I am going to ask you how much difficulty, if any, you have doing certain activities. I will read out a choice of five answers and you will choose the one that describes you best.

		1. None	2. Mild	3. Moderate	4. Severe	5. Extreme/ Cannot do
3	Because of your eyesight, how much difficulty do you have in going down steps or stairs?					
4	How much difficulty do you have in noticing obstacles while you are walking alone (e.g. animals or vehicles)?					
5	How much difficulty do you have in seeing because of glare from bright lights?					
6	Because of your eyesight, how much difficulty do you have in searching for something on a crowed shelf?					
7	How much difficulty do you have in seeing differences in colours?					
8	Because of your eyesight, how much difficulty do you have in recognizing the face of a person standing near you?					
9	How much difficulty do you have in seeing the level in a container when pouring?					

10	Because of your eyesight, how much difficulty do you have in <u>going to activities</u> outside of the house (e.g. sporting events, shopping, religious events)?					
11	Because of your eyesight, how much difficulty do you have in <u>recognizing people you know from a distance of 20 metres</u>?					
12	How much difficulty do you have in <u>seeing close objects</u> (e.g. making out differences in coins or notes, reading newsprint)?					
13	How much difficulty do you have in <u>seeing irregularities in the path</u> when walking (e.g. potholes)?					
14	How much difficulty do you have in <u>seeing when coming inside after being in bright sunlight</u>?					
15	How much difficulty do you have in <u>doing activities that require you to see well close up</u> (e.g. sewing, using hand tools)?					
16	Because of your eyesight, how much difficulty do you have in <u>carrying out your usual work</u>?					

In the next section, I am going to ask you how you feel because of your vision problem. I will read out a choice of five answers and you will choose the one that describes you best

		1. Never	2. Rarely	3. Sometimes	4. Often	5. Very often
17	Because of your eyesight, how often have you been <u>hesitant to participate in social functions</u>?					
18	Because of your eyesight, how often have you found that you are <u>ashamed or embarrassed</u>?					
19	Because of your eyesight, how often have you felt that you are a <u>burden on others</u>?					
20	Because of your eyesight, how often do you <u>worry that you may lose your remaining eyesight</u>?					

Does your vision problem affect your life in ways we have not mentioned? If YES, describe how.

Record as fully as possible the answer given.	

*   *   *

Questionnaire dimensions/subscales

Dimensions	Question Nos	Subscales
General vision	1	–
Ocular pain/discomfort	2	VS
Distance vision difficulty	3, 4, 10 11, 13	GF
Near vision difficulty	6, 8, 9, 12, 15	GF
Glare	5	VS
Light/dark adaptation	14	VS
Colour vision difficulty	7	GF
Role limitations	16	GF
Social functioning limitations	17	PS
Mental well-being	18, 20	PS
Dependency	19	PS

GF: General functioning subscale
PS: Psychosocial subscale
VS: Visual symptoms subscale

ATTACHMENT: VISION VIGNETTES

	Consider your vision in typical tasks of daily life – such as reading newspaper articles, recognizing objects on a post-card size (11 x 16 cm) photograph, recognizing faces of people from across the room, reading road signs and picking out details in pictures from a distance of 20 meters.					
2100	How much difficulty do you have with your vision?	1. None	2. Mild	3. Moderate	4. Severe	5. Extreme/ Cannot do

	[Hector] can read words in newspaper articles and can recognize objects on a post-card size (11 x 16 cm) photograph. He can recognize people's faces from across the room all the time and picks out most details in pictures from a distance of 20 meters.					
2101	How much difficulty do you think [name of person] has with vision?	1. None	2. Mild	3. Moderate	4. Severe	5. Extreme/ Cannot do

	[Sebastian] cannot detect any movement close to the eyes or even the presence of a light.					
2102	How much difficulty do you think [name of person] has with vision?	1. None	2. Mild	3. Moderate	4. Severe	5. Extreme/ Cannot do

	[Tania] has no problems with her vision in most tasks in her daily life. But she finds it a problem to pick out details in pictures from a distance of 20 metres.					
2103	How much difficulty do you think [name of person] has with vision?	1. None	2. Mild	3. Moderate	4. Severe	5.Extreme/ Cannot do

	[Norman] can read words in newspaper articles and can recognize objects on a post-card size (11 x 16 cm) photograph. He does not recognize people's faces from across the room or pick out details in pictures from a distance of 20 metres as they appear blurred.					
2104	How much difficulty do you think [name of person] has with vision?	1. None	2. Mild	3. Moderate	4. Severe	5.Extreme/ Cannot do

APPENDIX

**ICD–10 CODING FOR BLINDNESS AND LOW VISION
WITH SUGGESTED VISUAL ACUITY CATEGORY DEFINITIONS**[*]

H54   Visual impairment including blindness (binocular or monocular)

H54.0   Blindness, binocular
         V.I. categories 3, 4, 5

H54.1   Severe visual impairment, binocular
         V.I. category 2

H54.2   Moderate visual impairment, binocular
         V.I. category 1

H54.3   Mild or no visual impairment, binocular
         V.I. category 0

H54.4   Unqualified visual impairment, binocular
         V.I. category 9

H54.5   Blindness, monocular
         V.I. categories 3, 4, 5 in one eye and categories 0, 1, 2 or 9 in other eye

H54.6   Severe visual impairment, monocular
         V.I. category 2 in one eye and categories 0, 1 or 9 in other eye

H54.7   Moderate visual impairment, monocular
         V.I. category 1 in one eye and categories 0 or 9 in other eye

Note: The term visual impairment in category H54 comprises category 0 for mild or no visual impairment, category 1 for moderate visual impairment, category 2 for severe visual impairment, categories 3, 4 and 5 for blindness and category 9 for unqualified visual impairment. The term "low vision" included in the previous revision has been replaced by categories 1 and 2 to avoid confusion with those requiring low vision care.

If the extent of the visual field is taken into account, patients with a visual field of the better eye no greater than 10° in radius around central fixation should be placed under category 3. For monocular blindness (H54.5), this degree of field loss would apply to the affected eye.

---

[*] For definition of V.I. categories, see Table 1.

ANNEX 1

LIST OF PARTICIPANTS

Professor Adenike Abiose
IAPB Regional Chair – Africa, Sightcare International, 1 Zaki Road, P.O. Box 10392, Kaduna, Nigeria
Tel: + 234 62 417373 or 248684, Fax: + 234 62 248973, Abiose@infoweb.abs.net

Dr August Colenbrander
The Smith-Kettlewell Eye Research Institute and California Pacific Medical Center, San Francisco, 664 Atherton Avenue, Novato, CA 94945. USA
Tel: + 1 415 209 9529, Fax: + 1 415 209 9429, Gus@ski.org

Dr Christian Corbé
Directeur, Institution Nationale des Invalides, 6 Boulevard des Invalides, Paris 75007, France
Tel: + 33 1 40 63 23 00, Fax: + 33 40 63 2404, Secretariat.direction@invalides.fr
or ccorbel@aol.com

Dr Terry A. Cox (Rapporteur)
National Eye Institute, Building 31, Room 6A52, 31 Center Drive, MSC 2510, Bethesda, MD 20892-2510, USA
Tel: + 1 301 496 6583, Fax: + 1 301 496 2297, tac@nei.nih.gov

Dr Leon B. Ellwein
Associate Director for Applications of Vision Research, Building 31, Room 6A51, 31 Center Drive, MSC 2510, Bethesda, MD 20892-2510, USA
Tel: + 1 301 402 2625, Fax: + 1 301 496 9970, ellweinl@nei.nih.gov

Professor Astrid Fletcher (Chairperson)
London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK
Tel: + 44 207 927 2253/4, Fax: + 44 207 580 6897, astrid.fletcher@lshtm.ac.uk

Dr Y. Hiratsuka
Department of Ophthalmology, Juntendo University School of Medicine, Hongo 3-1-3, Bunkyo Ku, Tokyo, Japan 113
Fax: 81-3- 3817 0260, Juntenop@iris.dti.ne.jp

Dr Brien Holden
International Center for Eyecare Education, P.O. Box 328, Randwick, Sydney NSW 2031, Australia
Tel: + 61 2 9385 7435, Fax: + 61 2 9385 7436, b.holden@crcert.unsw.edu.au

Dr Lea Hyvärinen
Apollonkatu 6 A 4, FIN-00100 Helsinki, Finland
Tel: home office + 358-9-4125630, mobile phone + 358-50- 30 20 780, lea.hyvarinen@lea-test.fi

Dr Ahmed Trabelsi
Regional Co-Chair - Eastern Mediterranean, Vice President - Nadi Al Bassar, North Africa Center for Sight & Visual Sciences, 9 Boulevard Bab Menara, 1008 Tunis, Tunisia
Tel: + 261 1 560 333, Fax: + 261 1 561 737, atrabelsi@ophtalmo.com.tn

Dr Rohit Varma
Doheny Eye Institute, USC, 1450 San Pablo Street, Los Angeles, CA 90033, USA
Tel: + 1 323 442 6411, Fax: + 1 323 442 6412, rvarma@hsc.usc.edu

Professor Karla Zadnik
Glenn A. Fry Professor of Optometry and Physiological Optics, The Ohio State University College
of Optometry, 338 West Tenth Avenue, Columbus, Ohio 43210-1240, USA
Tel: + 1 614 292 6603, Fax: + 1 614 292 4705, zadnik.4@osu.edu

Dr Jialiang Zhao
President, Chinese Association of Ophthalmology, Director, Department of Ophthalmology, Peking
Union Medical College Hospital, 1 Shuai fu Yuan, Beijing 100730, People's Republic of China
Tel: + 86 10 6529 6358, Fax: + 86 10 6779 9405, zjlpumch@163.com ; zjl@csc.pumch.ac.cn

SECRETARIAT

Prevention of Blindness and Deafness, World Health Organization, Avenue Appia 20, CH-1211 Geneva 27, Switzerland:

> Dr D. Etya'alé, Medical Officer
> Dr I. Kocur, Medical Officer
> Dr S. Mariotti, Medical Officer
> Dr G. Pokharel, Medical Officer
> Dr R. Pararajasegaram, Medical Officer
> Dr S. Resnikoff, Coordinator

Classification, Assessment, Surveys and Terminology, World Health Organization, Avenue Appia 20, CH–1211 Geneva 27, Switzerland:

> Dr S. Chatterji, Scientist

Assessing Health Needs: Epidemiology and Burden of Disease, World Health Organization, Avenue Appia 20, CH–1211 Geneva 27, Switzerland:

> Dr K. Shibuya, Scientist

ANNEX 2

AGENDA

Opening of Meeting
Introduction of Participants
Election of Officers
Adoption of Agenda

1.   Review of WHO classification of severity of visual impairment: ICD–10 and ICF–2000

2.   Review of global burden of disease disability weights

3.   Review of characterization of the dimensions of vision loss

4.   Review of visual acuity measurement standards

5.   Review of International Council of Ophthalmology report and resolution

6.   Review of subjective assessment of visual functioning

7.   Recommendations for the characterization of vision loss and visual functioning

Closure of the meeting

ANNEX 3

WORKING GROUPS

Group 1 – Methods of Vision Assessment

 Dr Brien Holden, *Chair*
 Dr Christian Corbé
 Dr Terry A. Cox
 Dr Lea Hyvärinen
 Dr Ivo Kocur
 Dr Silvio Mariotti
 Dr Ahmed Trabelsi
 Dr Karla Zadnik

Group 2 – Proposed Revision of WHO Classification and Definitions

 Dr Rohit Varma, *Chair*
 Dr Adenike Abiose
 Dr S. Chatterji
 Dr August Colenbrander
 Dr R. Pararajasegaram
 Dr Serge Resnikoff
 Dr Jialiang Zhao

Group 3 – Instruments for Subjective Assessment of Visual Functioning

 Dr Leon Ellwein, *Chair*
 Dr Astrid Fletcher
 Dr Y Hiratsuka
 Dr Gopal P. Pokharel
 Dr Kenji Shibuya

= = =