

ASSESSMENT OF LOW VISION IN DEVELOPING COUNTRIES

BOOK 1

SCREENING FOR IMPAIRED VISION

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ACKNOWLEDGEMENTS

**The WHO Programme for the Prevention of Blindness
and the author wish to acknowledge:**

Low Vision Project International Planning Committee

Mr Keith Marshall	Ebenezer School and Home for the Blind Hong Kong
Associate Professor Jan Lovie-Kitchin	Queensland University of Technology Australia
Mrs Margaret Lawrence	Association for the Blind Ltd, Victoria, Australia

Professor Hugh Taylor and the staff of the Department of Ophthalmology, University of Melbourne, WHO Collaborating Centre for the Prevention of Blindness, Australia

Mr Bill Brohier and the regional representatives of International Council for Education of People with Visual Impairment

The illustrations are the work of Jack Manion

This set comprises 2 books:

Book 1: Screening for Impaired Vision

A basic introduction to testing visual acuity and visual fields

Book 2: Assessment of Functional Vision

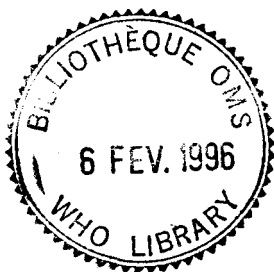
This book contains:

- observations of the effects of low vision for use in the community
- comprehensive assessment of functional vision
- suggestions for training effective use of vision

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56390
WHO/PBL/95.48

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INTRODUCTION

It is important to identify people who have impaired vision. In some eye conditions vision can be improved with spectacles, by an operation or with treatment. If possible, all people with impaired vision should be referred to a special eye doctor (ophthalmologist) to check if the condition can be treated or vision improved. If after treatment, the person still has low vision, they might need spectacles or special training or equipment so that they can join in activities in the home, school and community.

This book shows how to test visual acuity and visual fields. The test materials to use are included in the kit. They are:

- test of distance visual acuity
- test of near vision
- a "pinhole" mask to test if vision could be improved with spectacles. The mask is held in front of the eyes to block vision except for small holes directly in front of the eyes.

The results will help to:

- identify people with low vision as distinct from those who have normal vision and those who are blind
- identify people who need to be examined and treated by an eye specialist or who need spectacles.

The results of the tests should be recorded on the "Screening for Impaired Vision" form included in the kit.

A neutral position has been adopted where possible on the issue of gender by using the word "person". Where either the masculine or feminine is used, the statement applies to both.

DEFINITIONS

"Normal" vision. A person is able to perform all close and distant visual tasks that are normally expected in his community. Refractive correction, for example, spectacles may be needed to give "normal" vision.

Visual impairment. It is the reduced vision caused by eye disease, accident or eye condition present from birth. Some conditions can be treated or corrected to improve vision. Most people (about 80%) who are visually impaired have some vision, that is, they have low vision.

Low vision. There is significantly reduced vision, that is, visual acuity is less (worse) than 6/18 in the better eye or visual fields are less than 20 degrees in diameter. After treatment or with refractive correction, vision cannot be corrected to "normal". Visual performance may be affected. A person with low vision can use her reduced vision for learning about the world and for planning and doing tasks that need vision.

Total blindness. A person is unable to see light.

Functional vision. This refers to the use of vision for a particular purpose. Even small amounts of vision can be useful, for example to recognise a person close up, or to avoid objects. The use made of vision depends on a person's experiences and can vary with different conditions. Functional vision may be improved with refractive correction, low vision devices or instruction in the use of vision.

Visual acuity. It is a measure of the ability of the eye to see detail.

Visual field. The whole area that is seen when looking straight ahead when the eyes, head and body are still. The peripheral visual field is the outer edges of the field.

World Health Organization (WHO) definitions. The WHO has definitions which are used for surveys (how many people have normal or low vision, or are blind). The definitions use visual acuity and a measurement of visual field. It is important to use the WHO definitions for surveys. (The International Classification of Diseases, Tenth Revision).

The table below shows the WHO definitions using visual acuities.

Visual Acuity	WHO Classification
6/6 to 6/18	Normal vision
<6/18 to $\geq 3/60$ Worse than 6/18 but better than or equal to 3/60	Low vision
<3/60 Worse than 3/60	Blind

If the size of the visual field is used in a survey, less than 10 degrees in diameter is used to define blindness.

INSTRUCTIONS FOR ASSESSMENT

There are a number of things to look for when you think someone may have an eye problem or poor vision:

- the eyes may look different; they may be white across the centre of the eye (cataract) or the cornea (the clear window at the front of the eye) may look cloudy
- the person may not appear to be looking straight ahead
- the person may screw up her face and frown, especially in bright light or when trying to see something
- she may complain of changes in her vision
- it may be more difficult for the person to see at night than during the day
- she may bump into objects or people
- she may not be able to recognise people's faces from a distance.

Make some general observations before starting testing:

- what is the general health of the person?
- are there any obvious disabilities such as a hearing loss or physical disabilities?
- does the person watch what is happening?

Ask the person, his family or teacher what they know about the person's vision and eye condition.

Be familiar with the tests by reading through this manual.

Explain carefully to the person being tested what he has to do in each test. If the person can not complete any test, make sure that the instructions were understood. Demonstrate how to do the test again if necessary.

Provide encouragement. Don't use phrases such as "Look harder". Say, "Have another look". During the test do not let the person know if she is failing or doing badly. Allow the person to correct mistakes but check whether the person is guessing.

Sit or stand in a position to watch how the person works or behaves during testing, such as, with an unusual head posture or excessive frowning or eye movements. The best position is usually opposite the person doing the test.

Watch for any of these features while talking to and testing the person:

- does the person look at you or to one side of you?
- is the head straight or turned to one side?
- is the person using both eyes or is one eye closed or turned in, out, up or down?
- do the eyes and lids look healthy?
- does the person have continuous eye movements (nystagmus)?

Record these general observations with the test results. Make notes about the person's behaviour, for example "slow to answer", "turned head to look at test card".

Pass on this information if the person is referred for more testing, treatment or spectacles.

Repeat the testing any time there appears to be a change in vision. Vision might improve after treatment or with spectacles. Vision will get worse over time in some eye conditions.

DISTANCE VISUAL ACUITY AND NEAR VISION

Distance and near vision tests should be given to all people being assessed. Usually a person is tested with both eyes open.

The first step is to test distance visual acuity. One way to measure visual acuity is by testing the smallest symbol that can be recognised.

Measures of visual acuity are used to identify the amount of vision, changes in vision from one time to another and the effects of treatment. The measure of visual acuity does not tell *how well vision is used*.

A special test using the pinhole mask can identify those people with poor vision who may need spectacles to improve their vision. The pinhole should be used when a person has distance visual acuity worse than 6/18. People who have visual acuity improved with the pinhole should be referred for examination and treatment by an eye specialist.

DISTANCE VISUAL ACUITY

It does not matter if a person cannot read. Vision can be tested using the E cards included in this kit. Other tests can be used if you have them. Use the test that is easiest for the person you are testing.

Acuities: 6/18 - at least 3 out of 4 small Es (size 18)
 identified from 6 metres
 6/60 - at least 3 out of 4 large Es (size 60)
 identified from 6 metres, but size 18 symbols
 not correctly identified

3/60 - at least 3 out of 4 large Es identified from 3 metres but not from 6 metres.

The sizes 60 and 18 are the distances in metres that the shapes can be read by a person with normal vision.

A person having a visual acuity of 6/18 may be able to see smaller symbols but these are not used in this distance test. If the near vision card is used at 6 metres and the largest Es are seen, visual acuity is 6/6.

If at 3 metres the large E cannot be recognised, visual acuity is recorded as *less than 3/60* (often written as $< 3/60$). The person may have useable vision and it is important to discover the amount and quality of the vision even though it is limited; test visual acuity with the large E at 2 or 1 metre. You can use Book 2, The Effects of Low Vision and Assessment of Functional Vision to obtain more information. Some people have no vision at all.

If vision is being tested for a regional or country survey, the World Health Organisation (WHO) categories should be used. Normal vision is acuity of 6/18 or better.

Low vision is acuity less than 6/18.

Blindness is acuity less than 3/60.

In some countries, distance for testing is measured in feet. 6 metres is approximately equal to 20 feet. Visual acuities are recorded as:

$$20/20 = 6/6$$

$$20/60 = 6/18$$

$$20/200 = 6/60$$

$$10/200 = 3/60$$

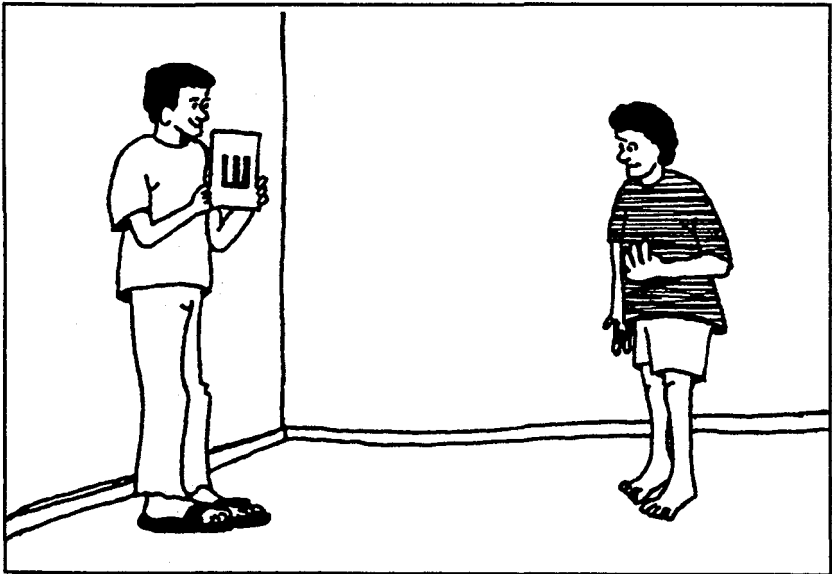
Testing Instructions

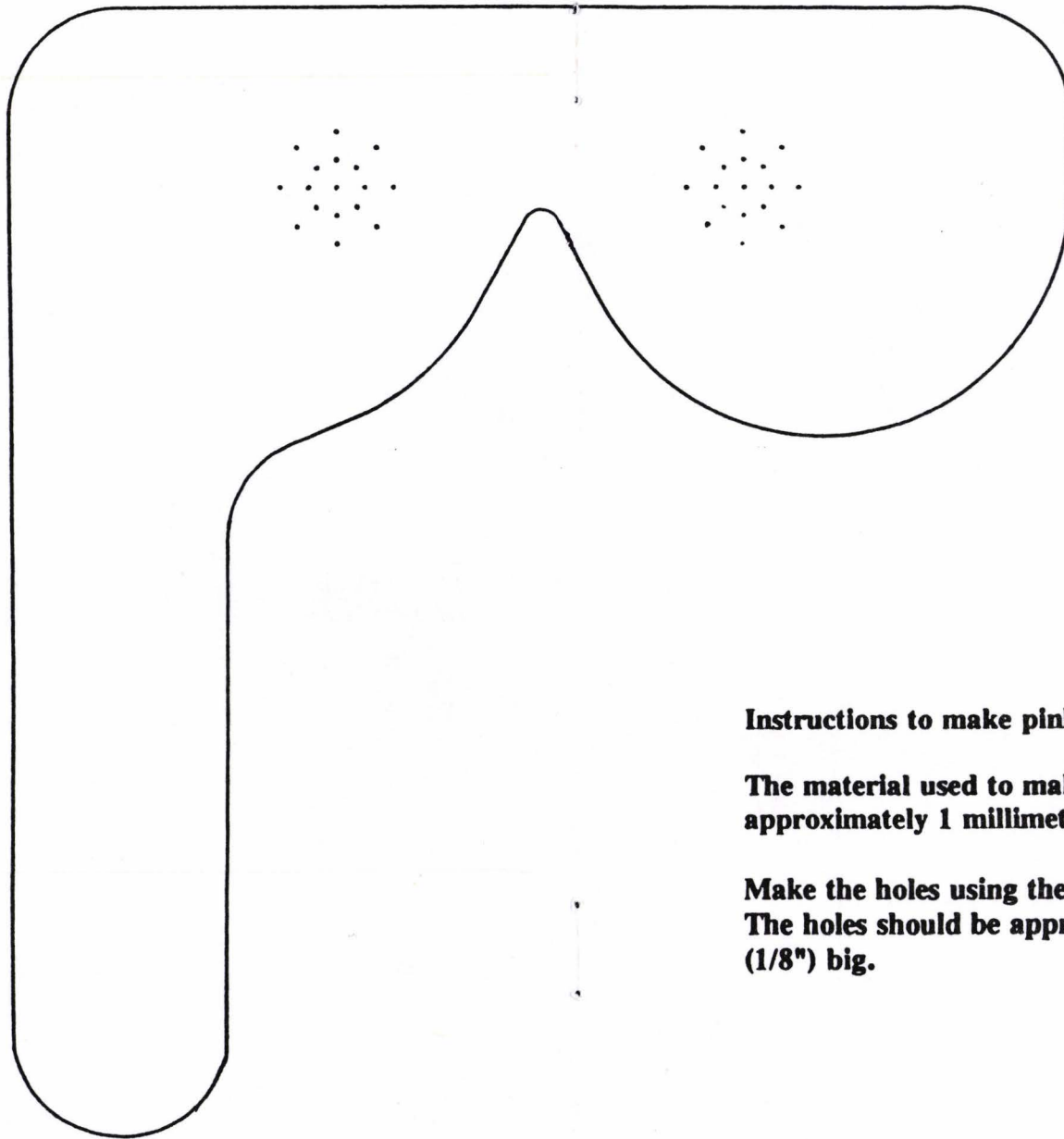
Check that you have the best lighting available during testing. Choose a well lit area inside. Outside, choose a well lit but shady area.

Test the person with spectacles on if they are normally used for distance tasks.

The normal test distance is 6 metres (20 feet) for distance vision. The person must stand 6 metres from you. Measure or count the number of your steps to equal 6 metres.

When teaching young children to do the test, demonstrate close to the child. Then move away to 6 metres and make sure that the child knows where to look and can concentrate on the test.





Instructions to make pinhole mask

The material used to make the mask should be approximately 1 millimetre (1/8") thick.

**Make the holes using the pattern shown here.
The holes should be approximately 1 millimetre (1/8") big.**

Hold the test card at eye level of the person being tested. Use the side of the card with the 4 small Es (size 18) and ask the person to indicate the direction that the legs of the E are pointing - up, down or to either side.

When testing young children with the smaller Es, it may be necessary to point to each E on the card in turn so that there is no confusion over the E to which the child is responding.

If 3 or 4 of the small E's are correct, no further testing of distance vision is needed. Vision is within the "normal" range. Record distance visual acuity as 6/18.

If less than 3 of the small Es are correct, turn the card over and test with the large E (size 60). Turn the card so that the legs of the E point in a different direction. Repeat this so that the E is shown 4 times in different directions.

If 3 or 4 of the large E's are correct, record distance visual acuity as 6/60.

If less than 3 of the large (size 60) Es are correct, repeat the test with the person standing 3 metres from the card and use the large E.

If 3 or 4 of the large E's are correct at 3 metres, record distance visual acuity as 3/60.

Record two numbers for the measure of distance visual acuity. The first number is the distance used for testing. Record the result for either 6 or 3 metres. The second number is the size of the symbol read.

Examples: 6/18

6/60

3/60

Testing vision in each eye

Sometimes you might want to test the vision in each eye separately as there may be a difference in vision between the 2 eyes. If it is thought that there is little or no vision in 1 eye, it may be useful to test each eye separately.



Test the right eye first. Ask the person to cover the left eye with the palm of the left hand keeping both eyes open. Make sure the eye is properly covered. Record the visual acuity.

Cover the right eye with the right hand as shown in the diagram. Test the left eye. Record the visual acuity for the left eye.

DISTANCE VISUAL ACUITY WITH PINHOLE

Do this test only if visual acuity is worse than 6/18.

Testing Instructions

The person holds the pinhole mask to her eyes so that she can only see through the small holes. Hold the mask against the face, resting on the nose. It may be necessary to make a small movement of the mask so that she can see through at least one hole.

Repeat the procedures for testing distance acuity. The person must stand 6 metres from the test card.



Record the visual acuity with the pinhole.

If visual acuity is better with the pinhole, refer the person to an eye specialist who can check if spectacles are needed to improve vision.

Examples of improved visual acuity are:

Without pinhole:

6/60

3/60

<3/60

With pinhole:

6/18

6/60, 6/18

3/60, 6/60, 6/18

If needed, each eye can be tested with the pinhole by covering each side of the pinhole in turn with a hand.

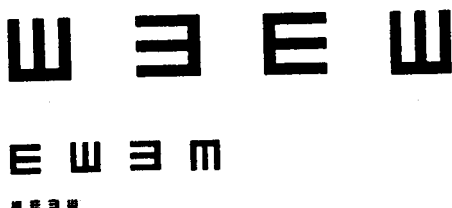
NEAR VISION

The purpose in testing near vision is to determine if people can cope with near tasks; if they need some changes to the task or the environment; or if spectacles or low vision devices would be useful.

The results of a near vision test show a person's ability to see the details of near objects (within arm's distance from the body). The results of the test will give an idea of the detail that can be discriminated. Near tasks include craft and leisure activities, eating, personal care and hygiene, some work tasks and reading.

Near and distance vision are not always affected to the same degree in all eye conditions. In children near vision is often not as severely affected as distance vision.

The three sizes of Es on the near vision test have been selected to indicate differences in useable near vision.



The smallest Es (N8) are similar to the size of print in books for older children and adults. Some newspapers have print this size.

Fine tasks that would be similar to reading the smallest Es are threading needles and using fine thread for sewing or weaving, measuring and carving.

People who cannot recognise the smallest symbols should be referred to check if spectacles or low vision devices may be helpful.

The middle sized Es (N20) are similar to the size of print in books for young children and in special large print books for children and adults. People who can just see these symbols may have difficulty seeing fine detail or small patterns.

The largest size (N48) is like the print that has been magnified by special low vision devices (magnifiers). This size print is also found on signs, labels and headings in books and newspapers. This size is the same as the size 6 for testing distance vision (acuity of 6/6).

The information from a test of near vision can help in making decisions about whether normal print, large print, low vision devices or braille will be best for a person. The results of the near vision test are not the only information needed to make such a decision.

Other factors which can affect this decision are reading speed, tiredness (fatigue) from reading, availability of spectacles and low vision devices, and availability of print or braille materials. *Distance visual acuity* should not be used to decide on the best type of reading material.

The near vision test needs concentration for only a short time. Some tasks may require concentration on near objects for a long time. This may cause tiredness (fatigue). Fatigue can affect vision; larger objects or print may be needed to

prevent a person from becoming tired from concentrating on a near task.

Testing Instructions

No standard distance is required. The test card is held at the distance preferred by the person. Young children may see better when the card is held close to the eyes.

Test the person with spectacles on if they are normally used.

The picture shows how a person should sit or stand in relation to the light from a window, door or the sun. The light should be coming from behind and to one side of the person. Avoid glare; make sure that the person is not looking towards the sun or other bright light.



Stand in front of the person so that you can observe behaviour during reading.

Start with the largest Es. If a child cannot see these, tell him to hold the card closer to his eyes.

Record the smallest size able to be read correctly. Also measure and record the distance the card is held from the eyes.

VISUAL FIELDS

This test can be done when you think the person may have reduced or unseen parts of the visual fields. The person might have trouble seeing objects to the side, above eye level or on the ground. She may bump into objects or trip over things on the ground. She may also have trouble seeing in dull light and at night.

It is difficult to test the visual fields of children less than about 8 years of age because they may be unable to concentrate and follow the instructions. For older people the following methods can be used. With this test the person will show you the limits of her visual field.

Practise the instructions yourself so that you know the limits of a normal visual field.

Sit or stand at 2 metres opposite the person so that you can check that your instructions are being followed. *Make sure that she keeps looking straight ahead during testing.*

Testing Instructions

"Look straight ahead at me. Hold one arm straight out at shoulder level to one side of your body so that you cannot

see your arm. Keep your arm straight (see Figure 1). Slowly move your arm forward. Stop when you can see your *hand*." Note the position of the arm. "Put your arm down". Repeat these instructions with the other arm.

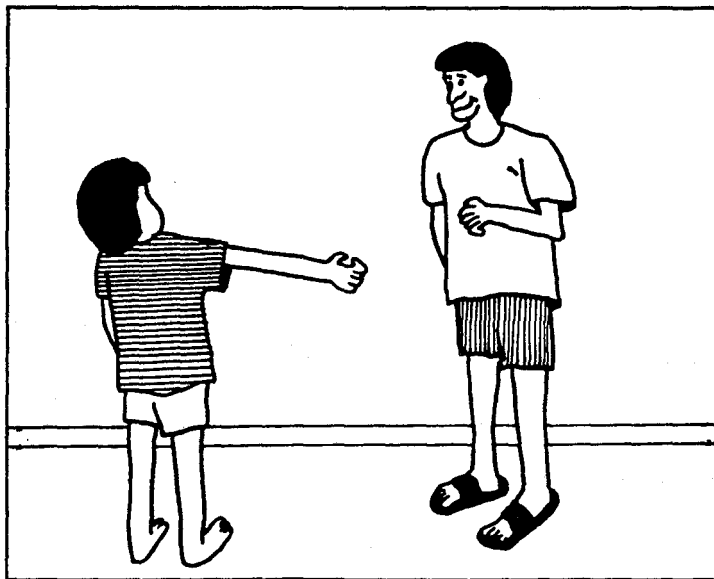


Figure 1

"Look straight ahead at me. Hold your arm straight up above your head. Keep your arm straight. Slowly move your arm down to the front. Stop when you can see your *hand*." Note the position of the arm. "Put your arm down". Repeat these instructions with the other arm.

"Look straight ahead at me. Hold your right arm down to your side. Keep your arm straight. Slowly move your arm up to the front of you (see Figure 2). Stop when you can see your *hand*." Note the position of the arm. "Put your arm down".

Repeat with the left arm.

Note if any part of the field is reduced. Record the result of testing by drawing or describing the visual fields. Describe the amount of loss as being slight, moderate or significant. Name the part of the field that is reduced - to the person's right or left, upper or lower. Examples are - moderate loss in the right upper field, significant loss in the left lower field.



Figure 2

CONCLUSION

For people with low vision, spectacles may improve their vision but not correct it to normal. For others, spectacles will not improve vision at all.

People with the same eye condition and visual acuity do not necessarily make the same use of their vision and manage in the same way.

Differences in visual functioning may be caused by one or more of the following characteristics in people:

- age when low vision occurred
- confidence in using vision
- motivation (wanting) to use vision
- experience in learning to use vision
- intelligence
- personality
- other disabilities
- how a person is feeling - tired, sick, worried.

Tests of visual acuity and visual fields can be used to identify people who have low vision or are blind and who need a medical examination to see if the eye condition is curable. If the condition is not able to be cured, the effect of the low vision should be assessed.

The results of visual acuity and visual field testing do not show how a person can use their vision. The results give a starting point in assessment of people with impaired vision. Book 2 in this set explains how to observe the effects of low vision for each person and how to assess and train a person's use of vision for a variety of tasks.

Further Information can be obtained from:



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