Evidence profile: visual impairment

Scoping question:
For older people with visual impairment, does case finding, provision of care or referral produce any benefit and/or harm compared with controls?

The full ICOPE guidelines and complete set of evidence profiles are available at who.int/ageing/publications/guidelines-icope

Painting: "Wet in Wet" by Gusta van der Meer. At 75 years of age, Gusta has an artistic style that is fresh, distinctive and vibrant. A long-time lover of art, she finds that dementia is no barrier to her artistic expression. Appreciated not just for her art but also for the support and encouragement she gives to other artists with dementia, Gusta participates in a weekly art class. Copyright by Gusta van der Meer. All rights reserved
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Background

Worldwide, approximately 185 million people aged 50 years and over are visually impaired (1). More than half of all people with visual impairment live in low- and middle-income countries, with India having the highest number of blind people: 8.3 million (2, 3). In older people, visual impairment influences their ability to live an independent life (4), and increases the need for social care (5). Moreover, there is a strong association between vision impairment and undesirable outcomes, including depressive symptoms (6), lower life satisfaction (7), poor quality of life (8, 9) and reduced social interaction and function (10–12). Poor vision in older people increases the risk of falls (13–22) and mortality (23–29).

Among the causes of visual impairment, cataract and refractive errors are most common in older people. Cost-effective interventions, such as cataract surgery and provision of corrective glasses, have shown consistent benefit in reducing disability, limitation in activities, anxiety, depression, risk of falls and fractures (30–34). Despite the availability of cost-effective treatments, eye care utilization by older adults has been found to be infrequent: only 10%, 24%, 22% and 37% of older people living in low-, lower-middle-, upper-middle- and high-income countries, respectively, reported having had an eye exam during the preceding year, while approximately 61% of older people living in low-income countries had never had an eye exam. Research evidence suggests that community case-finding and immediate provision of eye care or referral for cataract surgery might reduce the substantial treatment gap for vision impairment in older people. However, the majority of intervention trials were conducted in high-income countries, and the feasibility of implementing this approach in a resource-poor setting is unclear. Further, mass community-based screening of asymptomatic older people has been reported to produce no benefits in reducing visual impairment (35, 36). The lack of effectiveness found by studies may be due to the absence of immediate provision of a subsequent intervention to treat the detected problem or to the fact that the majority of studies have been carried out in high-income countries, where vision testing is available and accessible, and the unmet need is relatively small. Therefore, this review has been conducted to synthesize the evidence for community case-finding and provision of care or referral for visual impairment in older people.
Part 1: Evidence review

Scoping question in PICO format (population, intervention, comparison, outcome)

Population
- Older people (both male and female) aged 60 years and over with refractive errors or cataract

Interventions
- Case-finding and referral for refractive error or cataract
- Case-finding and immediate provision of care for refractive error

Comparison
- Usual care control

Outcomes
- Critical: Visual acuity, vision-related quality of life, self-reported improvement
- Important: Social function, depression

Setting
- Community care/primary care
Search strategy

The search strategy is provided in Annex 1 (page 20).

List of systematic reviews (and individual studies) identified by the search process

Included in GRADE1 tables or footnotes


Excluded reviews and trials


## PICO table

<table>
<thead>
<tr>
<th></th>
<th>Intervention/Comparison</th>
<th>Outcomes</th>
<th>Systematic reviews and individual studies used for GRADE</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>• Social function</td>
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<td>• Depression</td>
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<td>• Activities of daily living (ADLs)</td>
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<td></td>
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<td>• Social function</td>
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<td>• Depression</td>
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<tr>
<td></td>
<td></td>
<td>• ADLs</td>
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</tbody>
</table>
Narrative description of the studies that went into the analysis

Screening and referral

The Cochrane systematic review by Smeeth and Iliffe was carried out to assess the effectiveness of community screening for visual impairment in older people for improving vision (35). The authors searched the Cochrane Eyes and Vision Group Trials Register, The Cochrane Library, the National Research Register, MEDLINE, Embase, PubMed, SciSearch and additional sources for published data. There were no language or date restrictions on the search for trials. Also, they contacted investigators to identify additional unpublished studies or further information not included in the published reports of the trials. Both authors worked independently to extract data and assess trial quality. The authors included randomized trials (RCTs) comparing visual or multicomponent assessment for visual impairment with usual care in older adults who were not identified as belonging to a particular risk group.

Moore et al. conducted a cluster RCT at a community-based practice in the United States America to evaluate the effectiveness of a 10-minute office-staff administered screening to assess several conditions including visual impairment (33). They enrolled 261 patients aged 70 years and older and compared screening with usual care. The intervention consisted of a question to assess difficulty performing everyday activities followed by use of a Snellen eye chart if impairment was indicated by the answer to the question. Six months after enrolment, authors contacted the participants through a mailed questionnaire that addressed, among others, changes in self-reported vision. No differences were noted between the intervention (screening) and control (usual care) groups regarding changes in self-reported problems with vision.

The study by Coleman et al. was carried out in the United States to evaluate the benefits of eyeglasses and magnifiers in elderly patients with uncorrected refractive errors (32). In this RCT, the authors assessed the effects of immediate versus delayed corrective lenses. They enrolled 131 community-dwelling people aged 65 years and older whose distant visual acuity, near visual acuity or both could be improved with eyeglasses, a magnifier or both. The primary outcome of the study was vision-specific functioning, measured using the 25-item National Eye Institute Visual Functioning Questionnaire (NEI-VFQ-25). Results showed improvements in vision-related quality of life in the participants who received a prescription and voucher for eyeglasses immediately. Moreover, they had significant improvement in perception of their general vision, distance visual acuity, near visual acuity and mental health.

The study by Owsley et al. was also an RCT on the effects of immediate versus delayed provision of corrective lenses (34). The authors evaluated 151 patients aged 55 years and older having uncorrected refractive error and residing in nursing homes in the USA. The study reported that dispensing spectacles to treat uncorrected refractive error led to improved vision-targeted health-related quality of life, fewer reported difficulties in the visual activities of daily living (ADLs) and decreased depressive symptoms.
### GRADE table 1: Vision screening and referral compared with standard care for older people

**Author:** WHO systematic review team  
**Date:** 20 October 2015  
**Question:** What is the effectiveness of vision screening as part of multicomponent screening packages compared with standard care for older people?  
**Setting:** Primary care or community  
**Bibliography:** Smeeth LL, Iliffe S. Community screening for visual impairment in the elderly. Cochrane Database Syst Rev. 2006;(3):CD001054 (35). [Systematic review was updated by WHO in 2015]

<table>
<thead>
<tr>
<th>Number of studies</th>
<th>Study design</th>
<th>Risk of bias</th>
<th>Inconsistency</th>
<th>Indirectness</th>
<th>Imprecision</th>
<th>Other considerations</th>
<th>Number of patients</th>
<th>Effect</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vision screening as part of multicomponent screening packages</td>
<td>Vision screening as part of multicomponent screening packages</td>
<td>Standard care</td>
<td>Relative (95% CI)</td>
<td>Absolute (95% CI)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-reported improvement in vision (follow-up 20 months to 4 years; assessed with direct question)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>randomized trials</td>
<td>serious a</td>
<td>not serious</td>
<td>serious b</td>
<td>not serious</td>
<td>none</td>
<td>430/1656 (26.0%)</td>
<td>426/1838 (23.2%)</td>
<td>RR 1.03 (0.92 to 1.15)</td>
<td>7 more per 1000 (from 19 fewer to 35 more)</td>
</tr>
<tr>
<td>Visual acuity less than 6/18 in either eye (follow-up 3–5 years)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>randomized trials</td>
<td>serious c</td>
<td>not applicable</td>
<td>serious b</td>
<td>not serious</td>
<td>none</td>
<td>307/829 (37.0%)</td>
<td>339/978 (34.7%)</td>
<td>RR 1.07 (0.84 to 1.36)</td>
<td>24 more per 1000 (from 55 fewer to 125 more)</td>
</tr>
</tbody>
</table>

(continued next page)
### Mean composite visual function score

| 1 | randomized trials | serious \( ^c \) | not applicable | serious \( ^b \) | not serious | none | 829 | 978 | — | MD 0.4 higher (1.7 lower to 2.5 higher) | LOW | CRITICAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|

CI: confidence interval; MD: mean difference; RR: relative risk.

a. Risk of bias: Downgraded once as outcome assessors were not masked in three trials.
b. Indirectness: Downgraded once as all included trials were from high-income countries.
c. Risk of bias: Downgraded once as high drop-out rates were reported in the trials (response rate to follow-up in the two groups: 57.9% [829/1432] in the intervention group and 67.8% [978/1443] in the control group).
### GRADE table 2: Provision of immediate or delayed care (correction) for older people with uncorrected refractive error

**Author:** WHO systematic review team  
**Date:** 10 October 2015  
**Question:** What is the effectiveness of receiving vision correction aids immediately (glasses, magnifier or both) compared with delayed correction (voucher and prescription or glasses) for older people with uncorrected refractive error?  
**Setting:** Primary care or community  
**Bibliography:**  

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of patients</th>
<th>Effect</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Improvement in vision-specific functioning</strong> (including near and distance vision; follow-up 2–3 months; assessed with National Eye Institute Visual Functioning Questionnaire – 25 [NEI-VFQ-25]; higher score = better performance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 randomized trials</td>
<td>serious a</td>
<td>serious b</td>
<td>serious c</td>
<td>not serious</td>
</tr>
<tr>
<td><strong>Social functioning</strong> (follow-up 3 months; assessed with NEI-VFQ; higher score = better performance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 randomized trials</td>
<td>serious d</td>
<td>not serious</td>
<td>serious c</td>
<td>serious d</td>
</tr>
</tbody>
</table>

(continued on next page)
**Depression** (follow-up 2–3 months; assessed with Geriatric Depression Scale; lower score = better performance)

<table>
<thead>
<tr>
<th>2 randomized trials</th>
<th>serious *</th>
<th>not serious</th>
<th>serious ‡</th>
<th>not serious</th>
<th>none</th>
<th>144</th>
<th>129</th>
<th>MD -0.74 lower (-1.23 lower to -0.26 lower)</th>
<th>IMPORTANT</th>
</tr>
</thead>
</table>

CI: confidence interval; MD: mean difference; SMD: standardized mean difference

a. Risk of bias: Downgraded once as randomization method was inadequate in one of the included trials and allocation concealment method was unclear in the other trial.

b. Inconsistency: Downgraded once as moderate heterogeneity was observed in the meta-analysis ($\tau^2 = 0.16, \chi^2 = 5.82, df = 1 \{P = 0.02\}; I^2 = 83\%$). Reason for heterogeneity could be the characteristics of the participants: one study recruited older people living in the community and the other recruited from nursing home settings (41, 42).

c. Indirectness: Downgraded once as all included studies were from high-income countries and generalizing the evidence to other settings is questionable.

d. Imprecision: Downgraded once as sample size was small (smaller than 200).
Additional evidence

**GRADE table 3: Expedited compared with routine cataract surgery for older people with cataract**

<table>
<thead>
<tr>
<th>Author:</th>
<th>WHO systematic review team</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>20 October 2015</td>
</tr>
<tr>
<td>Question:</td>
<td>What is the effectiveness of expedited surgery compared with routine surgery for older people with cataract?</td>
</tr>
<tr>
<td>Setting:</td>
<td>Hospital</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality assessment</th>
<th>Number of patients</th>
<th>Effect</th>
<th>Quality</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of studies</td>
<td>Study design</td>
<td>Risk of bias</td>
<td>Inconsistency</td>
<td>Indirectness</td>
</tr>
<tr>
<td>Improvement in visual acuity (follow-up 6 months; assessed with Snellen chart)</td>
<td>3 randomized trials</td>
<td>not serious</td>
<td>serious a</td>
<td>serious b</td>
</tr>
</tbody>
</table>

CI: confidence interval; OR: odds ratio.

- Inconsistency: Downgraded once as moderate heterogeneity was observed (Chi² = 2.59, df = 1 [P = 0.03]; I² value = 78%).
- Indirectness: Downgraded once as all included trials were conducted in high-income countries.
### Part 2: From evidence to recommendations

#### Summary of evidence

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Effect size</th>
<th>Visual screening as part of multicomponent screening packages vs standard care</th>
<th>Screening and immediate intervention for refractive error</th>
<th>Expedited compared with routine cataract surgery</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Self-reported improvement</strong></td>
<td>RR 1.03 (0.92 to 1.15)</td>
<td>LOW</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>GRADE table 1, Smeeth and Iliffe (35)</td>
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</tr>
<tr>
<td><strong>Visual acuity less than 6/18 in either eye</strong></td>
<td>RR 1.07 (0.84 to 1.36)</td>
<td>LOW</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>GRADE table 1, Smeeth and Iliffe (35)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Mean composite visual function score</strong></td>
<td>MD 0.4 higher (-1.7 lower to 2.5 higher)</td>
<td>LOW</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>GRADE table 1, Smeeth and Iliffe (35)</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Improvement in visual function</strong></td>
<td>—</td>
<td></td>
<td>SMD 1.03 higher (0.42 higher to 1.65 higher)     VERY LOW</td>
<td>—</td>
</tr>
<tr>
<td>GRADE table 2, Coleman et al. (32), Owsley et al. (34)</td>
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<tr>
<td><strong>Social function</strong></td>
<td>—</td>
<td></td>
<td>MD 5.4 higher (1.55 lower to 12.35 higher)     VERY LOW</td>
<td>—</td>
</tr>
<tr>
<td>GRADE table 2, Coleman et al. (32), Owsley et al. (34)</td>
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### Depression
GRADE table 2, Coleman et al. (32), Owsley et al. (34)

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<th></th>
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<th>MD -0.74 lower (-1.23 lower to -0.26 lower)</th>
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</table>

### Improvement in visual acuity
GRADE table 3, Laidlaw et al. (37), Harwood et al. (38), Foss et al. (39)

|  |  |  | RR 7.22 (3.15 to 16.55) 358 more per 1000 (from 249 more to 416 more) LOW |

MD: mean difference; RR: risk ratio; SMD: standardized mean difference
### Evidence-to-recommendation table

<table>
<thead>
<tr>
<th>Problem</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the problem a priority?</td>
<td>Visual impairment is associated with a risk of significant decline in functional ability in older people, and with several adverse outcomes, including reduced quality of life and functional ability, and increased falls and mortality. Many conditions that contribute to vision impairment can be treated effectively, and loss of vision can be prevented in many older people. Currently, there is huge gap in timely access to comprehensive eye care, which can be improved through community case-finding, and appropriate provision of referral and care at primary or community care settings.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Benefits and harms</th>
<th>Explanation</th>
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<tbody>
<tr>
<td>Do the desirable effects outweigh the undesirable effects?</td>
<td>There is no direct evidence on the effectiveness of community case-finding through screening and referral for visual impairment in older people. Six population-based randomized controlled trials (RCTs) were evaluated and found no difference in vision and other clinical or functional outcomes when comparing case-identification through vision screening with visual acuity testing or questions with usual care, no vision screening or delayed screening. Five of the RCTs recruited people aged 70 years and over and were conducted in primary or community care settings (8–12). Vision screening was performed as part of a multicomponent risk assessment of health functioning. Vision screening in four of those trials was conducted in the older person’s own home (8–11). Data on self-reported improvements in vision were pooled together in the meta-analysis. The pooled risk ratio of self-reported visual problems for older people in the intervention versus control groups was 1.03 (3494 participants, 95% confidence interval [CI]: 0.92 to 1.15). There was no significant heterogeneity observed in the pooled estimated ($\chi^2 = 0.88$, df = 4, $P = 0.93$, $I^2 = 0%$). The reasons for the lack of benefit across the six trials might have included: the high loss to follow-up in all trials; contamination of the intervention; a similar frequency of vision disorder detection and treatment in the screening and control groups in one trial; the use of a screening question to identify people for further testing; and low uptake of recommended interventions.</td>
</tr>
</tbody>
</table>

In the Cochrane review, three included randomized trials (n = 3346) of vision screening performed as part of a multicomponent screening intervention in older people (mean age, 76–81 years) were analysed (35). The trials found no difference between vision screening compared with no vision screening, usual care or delayed screening on vision and other clinical outcomes at follow-up assessment, six months to five years later. One cluster RCT (n = 4340) compared universal screening for vision (continued next page)
impairment (using the Glasgow Acuity Card followed by pinhole testing for people with visual acuity worse than 20/60) with targeted screening based on a brief screening questionnaire. Only 34% of vision assessments were carried out in peoples’ own homes; the rest were undertaken at the general practice surgery. At follow-up, 3–5 years after screening, the risk ratio for visual acuity less than 6/18 in either eye for universal versus targeted screening was 1.07 (95% CI: 0.84 to 1.36, \( P = 0.58 \)). The mean composite score of the 25-item National Eye Institute Visual Functioning Questionnaire (NEI-VFQ-25) was 85.6 in the targeted screening group and 86.0 in the universal group; the difference of 0.4 was not significant (95% CI: −1.7 to 2.5, \( P = 0.69 \)). In this trial, only half of the patients who were advised to see an eye care provider after vision screening actually received new glasses, which could have attenuated the potential benefits.

There is limited low-quality evidence on the effectiveness of community case-finding and immediate provision of care services for refractive error and cataracts for improving visual acuity in older people. Two RCTs reported that immediate correction of refractive error with eyeglasses for older people was associated with moderate improvements in short-term (2- to 3-month follow-up), vision-related quality of life or function compared with delayed treatment (32, 34). In one trial, older people in the intervention arm received prescriptions and vouchers for free eyeglasses, while in the other trial, older people were immediately provided with corrective glasses. Participants in one trial were community-dwelling older people aged 65 years and over, whereas the other trial recruited nursing home residents aged 55 years and over. In both trials, general vision subscale scores of the NEI-VFQ were improved by a mean of about 10 (out of 100) points in the immediate-treatment groups. The pooled mean difference between intervention and control groups was 11.87 (95% CI: 6.87 to 16.87).

We found no RCTs that evaluated cataract surgery versus no surgery. However, we identified three trials that examined the effectiveness of expedited cataract surgery compared with routine cataract surgery. Results showed that the expedited surgery was associated with gains in visual function and reduced visual disability.

The benefits of this approach outweighs harms: the adverse consequences associated with community case-finding and immediate provision of care were small or none.

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### Values and preferences/acceptability

<table>
<thead>
<tr>
<th>Question</th>
<th>Explanation</th>
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</thead>
<tbody>
<tr>
<td>Is there important uncertainty or variability about how much people value the options?</td>
<td>Visual impairment is a common and significant public health problem in older people. Many conditions that contribute to vision impairment can be treated efficiently, and loss of vision can often be prevented in older people. Currently, there is a huge gap in timely access to comprehensive eye care, which can be improved through community case-finding and timely provision of referral and care at primary health care or community-based settings. The guideline development group believed that the recommendation would be valued by older people and acceptable to key stakeholders.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major variability</th>
<th>Minor variability</th>
<th>Uncertain</th>
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<tbody>
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</table>

<table>
<thead>
<tr>
<th>Is the option acceptable to key stakeholders?</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Major variability</td>
<td>Minor variability</td>
</tr>
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### Feasibility/resource use

<table>
<thead>
<tr>
<th>Question</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>How large are the resource requirements?</td>
<td>Implementation of community case-finding and immediate provision of care might lead to substantial costs to health care systems. These costs would include “opportunity costs” for time spent in administering the visual acuity test and providing eyeglasses at primary health care settings or facilitating referral and follow-up. However, in most countries, prevention of blindness comes under the umbrella of the national programme for chronic and noncommunicable diseases. The recommendation can be incorporated into existing national programme budgets with minimal additional cost. The guideline development group firmly believed that the recommendation was feasible to implement in high-, middle- and low-resource health care settings.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major</th>
<th>Minor</th>
<th>Uncertain</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Is the option feasible to implement?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>No</td>
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</table>

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<table>
<thead>
<tr>
<th>Equity</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Would the option improve equity in health?</td>
<td>The guideline development group firmly believed that the recommendation would increase equity in health.</td>
</tr>
</tbody>
</table>
## Guideline development group recommendation and remarks

**Recommendation**

Older people should receive routine screening for visual impairment in the primary care setting, and timely provision of comprehensive eye care.

*Strength of the recommendation: Strong*

*Quality of evidence: Low*

### Remarks

- All of the primary studies available were carried out in high-income countries.
- The recommendation is applicable to people over 60 years of age (who may or may not visit primary care facilities to present with complaints of low visual acuity).
- Risk factors, such as diabetes, smoking, alcohol use, corticosteroid use and exposure to ultraviolet light should be considered and addressed.
- Comprehensive vision rehabilitation should be considered when services are available.
- Over half of older adults with impaired visual acuity achieve vision better than 20/40 with a refractive correction which can be obtained through non-invasive methods, in most cases with corrective lenses.
- The accuracy of responses to subjective questions during screening is unclear. Therefore, an objective visual acuity test should be the preferred choice in community case-finding.
References

26. Freeman EE, Egleston BL, West SK, Bandeen-Roche K, Rubin G.

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Annex 1: Search strategy for vision impairment

MEDLINE database (1946 to September 2015)

1. randomized controlled trial.pt.
2. (randomized or randomised).ab,ti.
3. placebo.ab,ti.
4. dt.fs.
5. randomly.ab,ti.
6. trial.ab,ti.
7. groups.ab,ti.
8. or/1-7
9. exp animals/
10. exp humans/
11. 9 not (9 and 10)
12. 8 not 11
13. exp vision screening/
14. exp vision tests/
15. ((vision or visual$) adj5 (screen* or assess* or test* or diagnos* or surveill*)).tw.
16. or/13-15
17. exp aged/
18. "Aged, 80 and over"/
19. exp health services for the aged/
20. (old$ adj5 (age$ or people or person$)).tw.
21. (geriatric$ or elderly or senior$).tw.
22. or/17-21
23. exp eye diseases/
24. exp visual acuity/
25. exp macular degeneration/
26. macula$ degenerat$.tw.
27. (eye$ or vision or ophthalmic or glaucom$ or cataract$ or presbyop$).tw.
28. or/23-27
29. 16 and 22 and 28
30. 12 and 29.
31. limit 30 to yr= " 2008-2015".

Embase database (1980 to first week of October 2015)

1. exp randomized controlled trial/
2. exp randomization/
3. exp double blind procedure/
4. exp single blind procedure/
5. random$.tw.
6. or/1-5
7. (animal or animal experiment).sh.
8. human.sh.
9. 7 and 8
10. 7 not 9
11. 6 not 10
12. exp clinical trial/
14. ((singl$ or doubl$ or trebl$ or tripl$) adj3 (blind$ or mask$)).tw.
15. exp placebo/
16. placebo$.tw.
17. random$.tw.
18. exp experimental design/
19. exp crossover procedure/
20. exp control group/
21. exp latin square design/
22. or/12-21
23. 22 not 10
24. 23 not 11
25. exp comparative study/
26. exp evaluation/

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Evidence profile: visual impairment

ICOPE guidelines – World Health Organization

27. exp prospective study/
28. (control$ or prospectiv$ or volunteer$).tw.
29. or/25-28
30. 29 not 10
31. 30 not (11 or 23)
32. 11 or 24 or 31
33. exp vision test/
34. ((vision or visual$) adj5 (screen$ or assess$ or test$ or diagnos$ or surveill$)).tw.
35. or/33-34
36. exp aged/
37. exp senescence/
38. exp elderly care/
39. (old$ adj5 (age$ or people or person$)).tw.
40. (geriatric$ or elderly or senior$).tw.
41. or/36-40
42. exp eye disease/
43. exp visual acuity/
44. exp retina macula degeneration/
45. macula$ degenerat$.tw.
46. (eye$ or vision or ophthalmic or glaucom$ or cataract$ or presbyop$).tw.
47. or/42-46
48. 35 and 41 and 47
49. 32 and 48
50. limit 49 to yr= “2008-2015”.

Search terms (MEDLINE) for interventions (1946 to September 2015)

1. randomized controlled trial.pt.
2. (randomized or randomised).ab,ti.
3. placebo.ab,ti.
4. clinical trails.ab,ti.
5. randomly.ab,ti.
6. trial.ab,ti.
7. groups.ab,ti.
8. or/1-7
9. exp animals/
10. exp humans/
11. 9 not (9 and 10)
12. 8 not 11
13. exp vision disorders/
14. exp visually impaired persons/
15. ((low$ or handicap$ or subnormal$ or impair$ or partial$ or disab$) adj3 (vision or visual$ or sight$)).tw.
16. or/13-15
17. exp rehabilitation/
18. ((rehabilitat$ or assess$) adj4 low vision).tw.
19. exp activities of daily living/
20. risk assessment/
21. risk factors/
22. risk management/
23. safety management/
24. (home adj3 safety$).tw.
25. (hazard$ adj3 (home or environment$)).tw.
26. home care services/
27. occupational therapy/
28. exercise therapy/
29. physical therapy modalities/
30. (behavior$ adj3 modif$).tw.
31. (program$ adj3 (home or exercise$ or modif$)).tw.
32. or/17-31
33. 16 and 32
34. 12 and 33
Annex 2: PRISMA² 2009 flow diagrams

Screening for vision impairment in community-dwelling older people

Records identified through MEDLINE and Embase database searching (n = 6789)

Records after duplicates removed (n = 5066)

Records screened (n = 5066)

Full-text articles assessed for eligibility (n = 13)

Studies included in qualitative synthesis (n = 5)

Studies included in quantitative synthesis (meta-analysis) (n = 5)

Records excluded (n = 5053):
- Target population or intervention different (n = 3217)
- Conference abstract (n = 123)
- Participants aged under 60 years (n = 1713)

Full-text articles excluded:
- Outcome data not reported (n = 8)

² Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). For more information: http://www.prisma-statement.org
Evidence profile: visual impairment

Screening and provision of care for vision impairment

- Records identified through database searching (n = 5454)
- Records after duplicates removed (n = 4467)
- Records screened (n = 4467)
- Full-text articles assessed for eligibility (n = 14)
  - Studies included in qualitative synthesis (n = 2)
  - Studies included in quantitative synthesis (meta-analysis) (n = 2)

Records excluded (n = 4453):
- Not eligible (intervention) (n = 3267)
- Wrong population (n = 1134)
- Not published in English (n = 52)

Full-text articles excluded, with reasons (n = 12):
- Outcome not reported (n = 6)
- Target population aged under 50 years (n = 3)
- Study design not randomized controlled trial (n = 3)