Improving the Nation’s Vision Health
A Coordinated Public Health Approach
The Conundrum of Vision Surveillance

for
The Institute of Medicine
Committee on Public Health Approaches to
Reduce Vision Impairment and Promote Eye Health

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Vision Health Initiative
Outline

1. Strategies & limitations of measuring vision impairment in surveys

2. Prevalence & effects of multiple chronic conditions among people with vision impairment.
Surveillance

- Surveillance is the foundation of public health
- Without sound surveillance, all other decisions may be incorrect
How many people experience vision impairment?
Population Estimates

- 3.3 million (40+) (Eye Diseases Prevalence Research Group, 2004)
- 5.7 million (65+) (Crews, Jones, & Kim, 2006)
- 14 million (12+) (Vitale, Cotch, & Sperduto, 2006)
- 21.2 million (18+) (Pleis & Lethbridge-Cejku, 2007)
- Desire to have large numbers
Estimate depends on what you ask

- Disease: macular degeneration, cataract (cataract removed), glaucoma, diabetic retinopathy
  - Self report vs clinical examination
- Impairment: difficulty seeing, acuity
- Activity performance: read newspaper print, recognize friend across the street (threshold or scaled response)
- Environment: Do you use any adaptive devices such as telescopic or other prescriptive lenses, magnifiers, large print....
Other vision variables

- Measured acuity: 20/40; 20/200
- Contrast sensitivity
- Field
- Duration
- Bilateral/unilateral
- Presenting or best corrected vision
- Experience of vision impairment is dimensional (affects eye/seeing, person, person in society) and dynamic (may change over time)
- No gold standard vision questions in surveys.
Vision questions in surveys

National Health Interview Survey

• National level data; samples about 75,000-100,000
• Two questions in core:
  – Any trouble see even with glasses
  – Blind, unable to see at all
• 2002 & 2008 Vision Supplement
  – Self-reported eye disease
  – Read newspaper print, go down stairs, drive during daytime in familiar places,
  – Work, hobbies
  – Vision rehab services, adaptive devices
Behavioral Risk Factor Surveillance Survey

• State level data, samples about 350,000
• Nine vision questions in module
  – Self-reported eye disease
  – Read print in newspaper; recognize friend across the street
  – Eye exam, dilated eye exam, health insurance, reasons why did not see eye care professional
• Administered in 26 states from 2005-2010
• 2013 ACS vision question in core: Are you blind or have serious difficulty seeing even when wearing glasses.
Surveillance Gap

• No vision surveillance system in the US.
• Therefore, no systematic effort to harmonize questions, create conceptual clarity, or establish comparability.
• Consequences:
  – Vision public health research appears fragmented.
  – Creates distinct disadvantage to inform decision making.
The State of Vision, Aging, and Public Health in America

Vision impairment is a serious public health concern among older adults affecting more than 2.9 million people in the United States. This issue brief summarizes the prevalence of vision loss and eye diseases reported by people aged 65 or older, and it provides information about access to eye care, health status, and chronic conditions among older adults. Data were collected from 13 states that used the Vision Impairment and Access to Eye Care Module (Vision Module) of CDC’s Behavioral Risk Factor Surveillance System (BRFSS) during 2006–2008.

Vision Loss and the Health of Older Adults

The prevalence of blindness and vision impairment increases rapidly with age among all racial and ethnic groups, particularly among people older than 75 years. Cases of age-related macular degeneration are expected to double by 2050, from 9.1 million to 17.8 million. Cases of diabetic retinopathy among people aged 65 or older are expected to quadruple by 2030, from 2.3 million to 9.9 million.

National studies indicate that vision loss is associated with higher prevalence of chronic health conditions, death, falls and injuries, depression, and social isolation. When combined with chronic health conditions such as diabetes, vision loss is associated with overall poorer health among people aged 65 or older. Vision loss compromises people’s quality of life because it reduces their capacity to read, drive a car, watch television, or keep personal accounts. Often, it isolates older people and keeps them from friends and family. Direct medical expenses for older adults with vision impairments cost the United States $8.3 billion a year.
Supplement to American Journal of Ophthalmology

Convened national/international panel of experts

Identified strategies to improve vision surveillance in US

Papers address disparities

Guide investigators and encourage harmonization of vision data
Vision Impairment and Co-morbid Conditions

- Represents serious emerging issue
- Represents another range of disparities
- Vision largely excluded from initiatives to address multiple chronic conditions (MCCs)
- Exclusion largely result of inconsistent case definition of vision
Emergence of Multiple Chronic Conditions

Percentage of Non-Institutionalized People With Specific Chronic Conditions

- Hypertension: 33.3%
- Disorders of lipid metabolism: 22.3%
- Other upper respiratory disease: 19.2%
- Non-traumatic joint disorders: 16.5%
- Diseases of the heart: 13.5%
- Diabetes mellitus: 12.6%
- Eye disorders: 11.2%
- Asthma: 10.1%
- Chronic respiratory infections: 10.0%

Eye disorders among people ≥65 years: 23%

Multiple Chronic Conditions: A Strategic Framework

Optimum Health and Quality of Life for Individuals with Multiple Chronic Conditions

U.S. Department of Health & Human Services
December 2010
Defining and Measuring Chronic Conditions: Imperatives for Research, Policy, Program, and Practice

Richard A. Goodman, MD, MPH; Samuel F. Posner, PhD; Elbert S. Huang, MD, MPH; Anand K. Parekh, MD, MPH; Howard K. Koh, MD, MPH


Abstract

Current trends in US population growth, age distribution, and disease dynamics foretell rises in the prevalence of chronic diseases and other chronic conditions. These trends include the rapidly growing population of older adults, the increasing life expectancy associated with advances in public health and clinical medicine, the persistently high prevalence of some risk factors, and the emerging high prevalence of multiple chronic conditions. Although preventing and mitigating the effect of chronic conditions requires sufficient measurement capacities, such measurement has been constrained by lack of consistency in definitions and diagnostic classification schemes and by heterogeneity in data systems and methods of data collection. We outline a conceptual model for improving understanding of and standardizing approaches to defining, identifying, and using information about chronic conditions in the United States. We illustrate this model’s operation by applying a standard classification scheme for chronic conditions to 5 national-level data systems.

Although the literature does not support a single uniform definition for chronic disease, recurrent themes include the non-self-limited nature, the association with persistent and recurring health problems, and a
## Twenty Chronic Conditions

Identified by Office of Assistant Secretary for Health (OASH)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypertension*</td>
<td>Chronic kidney disease*</td>
</tr>
<tr>
<td>Congestive Heart Failure</td>
<td>Chronic obstructive pulmonary disease</td>
</tr>
<tr>
<td>Coronary artery disease</td>
<td>Dementia (including Alzheimer’s &amp; other</td>
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<tr>
<td></td>
<td>senile dementias)</td>
</tr>
<tr>
<td>Cardiac arrhythmias</td>
<td>Depression</td>
</tr>
<tr>
<td>Hyperlipidemia</td>
<td>Diabetes*</td>
</tr>
<tr>
<td>Stroke*</td>
<td>Hepatitis</td>
</tr>
<tr>
<td>Arthritis*</td>
<td>Human immunodeficiency virus (HIV)</td>
</tr>
<tr>
<td>Asthma*</td>
<td>Osteoporosis</td>
</tr>
<tr>
<td>Autism spectrum disorder</td>
<td>Schizophrenia</td>
</tr>
<tr>
<td>Cancer*</td>
<td>Substance abuse disorders (drug &amp; alcohol)</td>
</tr>
</tbody>
</table>
Findings from NHIS

- NHIS Vision Questions:
  - Do you have any trouble seeing, even when wearing glasses or contact lenses?
  - Are you blind or unable to see at all?
  - 14.6% of people ≥ 65 years report trouble seeing or blind
Prevalence of eight chronic conditions among people aged ≥65 years

Data source: NHIS, 2007-2011
• What is the prevalence of vision impairment among people with chronic diseases?
Percent of people age ≥65 years with chronic conditions reporting vision impairment

Data source: 2007-2011 NHIS
• What are the effects of comorbid conditions among people with vision impairment?
Prevalence of self-reported fair/poor health among people with chronic conditions w/ and w/o vision impairment

Data source: NHIS 2007-2011
Take Home Message

Vision surveillance is constrained by:

1. A lack of consistency in definitions
2. A lack of conceptual clarity (purpose of questions)
3. A lack on comparability across surveys
Take Home Message

Multiple Chronic Conditions:

1. People with vision impairment are often more likely to experience other chronic conditions
2. Vision impairment in conjunction with MCCs has negative propelling effect
3. Vision impairment is not included in inventory of MCCs
Thank you
Thank you very much!
For more information please contact John E. Crews, DPA at Jcrews@cdc.gov 770 488 1116

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.