



**5<sup>th</sup> Annual**

# **FOCUS ON EYE HEALTH NATIONAL SUMMIT**

VISION TO ACTION: Collaborating Around a National Strategy

Wednesday, July 13, 2016  
National Press Club | Washington, DC



**Hugh Parry**  
President & CEO  
Prevent Blindness



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## The Focus Initiative



## THE *focus* INITIATIVE

*a forum on vision and public health convened by Prevent Blindness*

### The Focus Initiative

is a virtual forum for those working in vision and public health. This professional network encourages the sharing of resources (research, webinars, events, etc.) among the vision and public health community.

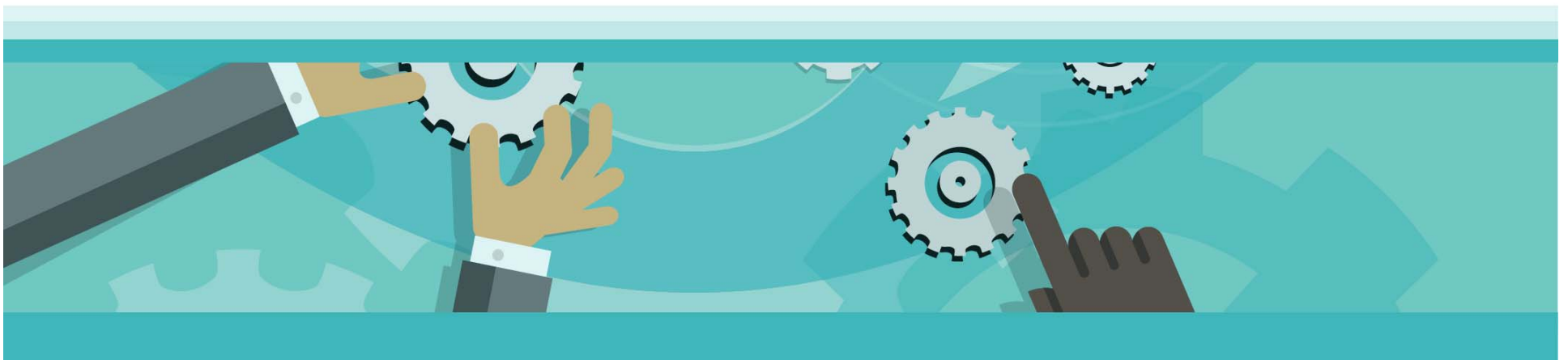
Check out the website: [www.preventblindness.org/focus](http://www.preventblindness.org/focus)

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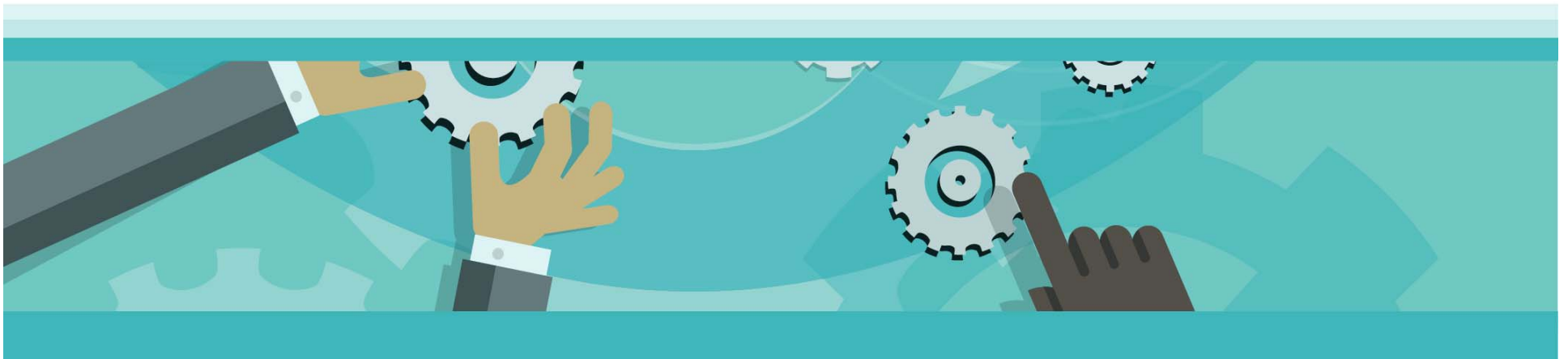




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#eyesummit





# Moderator



**Kathleen Murphy**, DNP, RN, NEA-BC, FAAN  
University of Texas Medical Branch





**Jinan Saaddine, MD, MPH**  
CDC Vision Health Initiative



## **NASEM Study Sponsors**

### **National Academies of Sciences, Engineering, and Medicine Consensus Study on Public Health Approaches to Reduce Vision Impairment and Promote Eye Health**

#### **Study Sponsors:**

American Academy of Ophthalmology  
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American Optometric Association  
Association for Research in Vision and Ophthalmology  
Centers for Disease Control and Prevention  
National Alliance for Eye and Vision Research  
National Center for Children's Vision and Eye Health  
National Eye Institute  
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## Overview of Forthcoming National Academies of Sciences, Engineering, and Medicine's Consensus Study on Public Health Approaches to Reduce Vision Impairment and Promote Eye Health



**Steven Teutsch**  
MD, MPH,  
Committee Chair



**Eve Higginbotham**  
SM, MD,  
Committee  
Member



**Sandra Block**  
OD, MEd, MPH,  
Committee  
Member



**Heather Whitson**  
MD, MHS,  
Committee  
Member

National Academies of Science, Engineering, and  
Medicine's Consensus Study on:  
Public Health Approaches to Reduce Vision  
Impairment and Promote Eye Health

Steven Teutsch, MD, MPH  
Adj. Prof. UCLA  
Sr. Fellow Public Health Institute  
Sr. Fellow, U. of So. Cal.

July 13, 2016

Prevent Blindness' 2016 Focus on Eye Health  
National Summit: Vision to Action – Collaborating  
Around a National Strategy

# Disclosure

- ▶ The committee is currently in the midst of the review process. Comments made by members of the committee should not be interpreted as positions of the committee, or of the Health and Medicine Division or the National Academies of Sciences, Engineering, and Medicine.
- ▶ We cannot discuss the content of the draft report as this may change, nor discuss the deliberations of the committee.



# Statement of Work

The National Academies of Sciences, Engineering, and Medicine will conduct a consensus study to examine *the core principles and public health strategies to reduce visual impairment and promote eye health in the United States*. The study will describe limitations and opportunities to improve vision and eye health surveillance; reduce vision and eye health disparities; promote evidence-based strategies to improve knowledge, access and utilization to eye care; identify comorbid conditions and characterize their impact; and promote health for people with vision impairment. The study will also examine the potential for public and private collaborations at the community, state, and national levels to elevate vision and eye health as a public health issue. Specifically, the committee will examine and make recommendations on the following . . .

# Statement of Work (cont.)

(1) **Characterizing the Public Health Burden.** Describe and characterize the public health significance of eye disease (e.g., glaucoma, macular degeneration, diabetic retinopathy, and cataract) and vision loss, and the relationship between vision loss and quality of life, health disparities, and comorbid conditions. Identify opportunities to improve surveillance, monitoring, and data integration strategies and to define metrics to support a more accurate assessment of the public health burden of eye diseases and vision loss.

(2) **Prevention and Care.** Explore innovative models of care, innovative technologies, their application to eye disease/ vision impairment detection and management, as well as barriers to their development and use. Examine and explore current and future areas of research on public health interventions that target prevention; access to, and utilization of, vision and eye care; and improved patient outcomes.

## Statement of Work (cont.)

**(3) Evidence-Based Health Promotion Interventions.** Identify strategies to develop, test, and encourage the implementation of health promotion interventions that are evidence based for people with vision impairment.

**(4) Eye Health and Vision Loss as a Public Health Priority.** Categorize and discuss the possible short- and long-term collaborative strategies to promote vision and eye health as a public health priority, including: (a) the role of public-private partnerships (e.g., improving public awareness; improving vision and eye care through federal, state, and community-based partnerships, and enhancing professional education); (b) the role of federal government and state and local communities in integrating vision and eye health interventions into existing public health programs (including systems and policy changes that support vision and eye health) that are both implementable and sustainable; and (c) engagement of key national partners to form collaborations for research, service delivery, outreach, and community-based studies to successfully improve access and quality to vision and eye care.



# Study Sponsors

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Association for Research in Vision and  
Ophthalmology

Centers for Disease Control and Prevention

National Alliance for Eye and Vision Research

National Center for Children's Vision and Eye  
Health

National Eye Institute

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# Committee on Public Health Approaches to Reduce Vision Impairment and Promote Eye Health

**Steven M. Teutsch, M.D., M.P.H.**  
*(Chair)*

University of California, Los Angeles  
Public Health Institute  
University of Southern California

**Sandra S. Block, O.D., M.Ed., M.P.H.**  
Illinois College of Optometry  
International Opening Eyes

**Lori Grover, O.D., Ph.D.**  
Salus University

**Anne L. Coleman, M.D., Ph.D.**  
University of California, Los Angeles

**Kevin Frick, Ph.D.**  
Johns Hopkins University

**Peter D. Jacobson, J.D., M.P.H.**  
University of Michigan

**Karen Glanz, Ph.D., M.P.H.**  
University of Pennsylvania

**Eve Higginbotham, M.D.**  
University of Pennsylvania

**Edwin C. Marshall, O.D., M.S., M.P.H.**  
Indiana University

**Christopher Maylahn, Dr.P.H., M.P.H.**  
New York State Department of Health

**Joyal Mulheron, M.S.**  
Sagacity Group, LLC

**Sharon Terry, M.A.**  
Genetic Alliance

**Cheryl Ulmer**  
Institute of Medicine (retired)

**Rohit Varma, M.D., M.P.H.**  
University of Southern California

**Heather E. Whitson, M.D., M.H.S.**  
Duke University

# Today's Agenda

## Intro and Population Health

Steven M. Teutsch, M.D., M.P.H.

## The Changing Health Care System

Eve Higginbotham, M.D.

## Vulnerable Populations and Access to Care

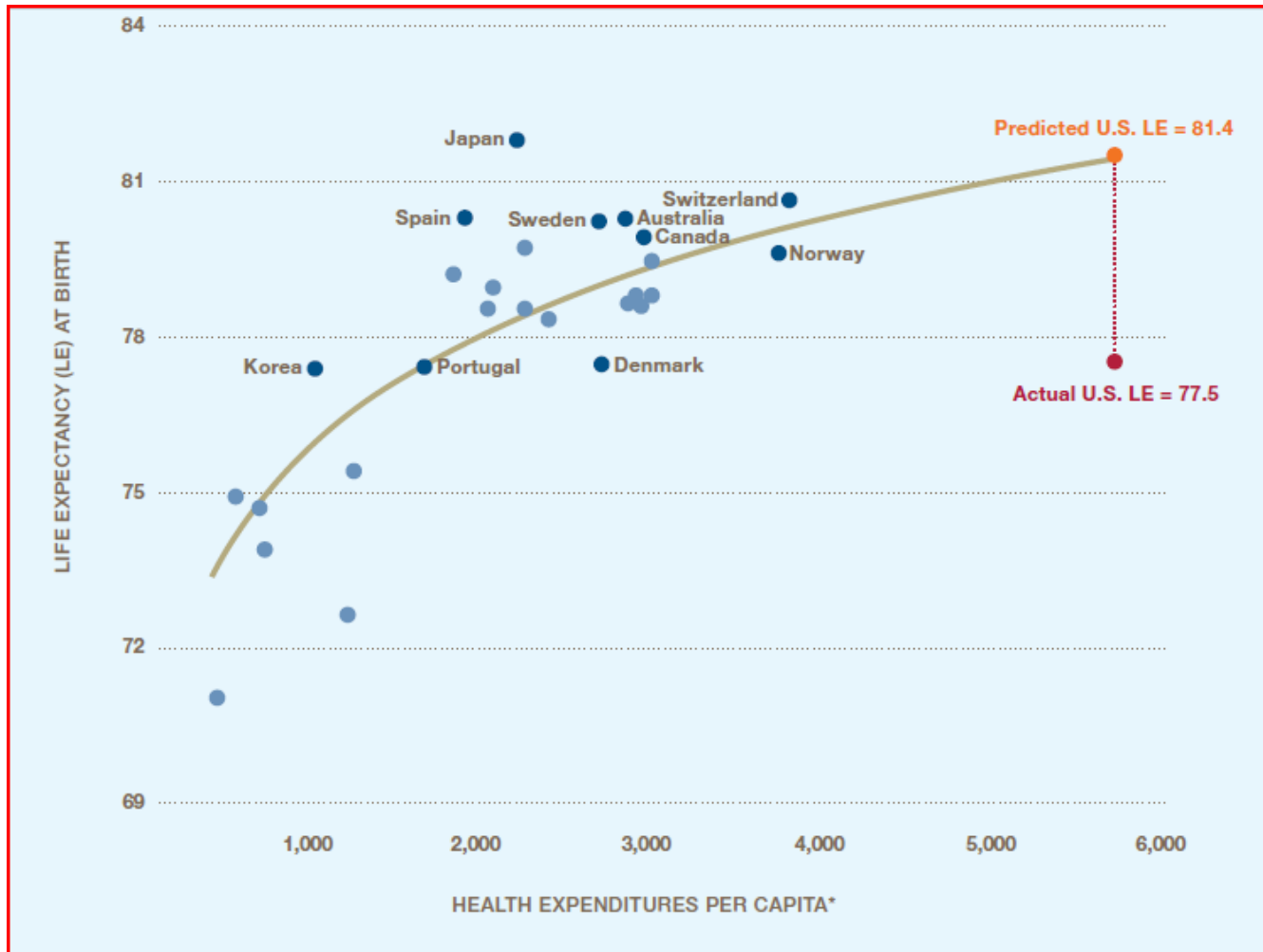
Sandra S. Block, O.D., M.Ed., M.P.H.

## Aging and Comorbidities

Heather E. Whitson, M.D., M.H.S.

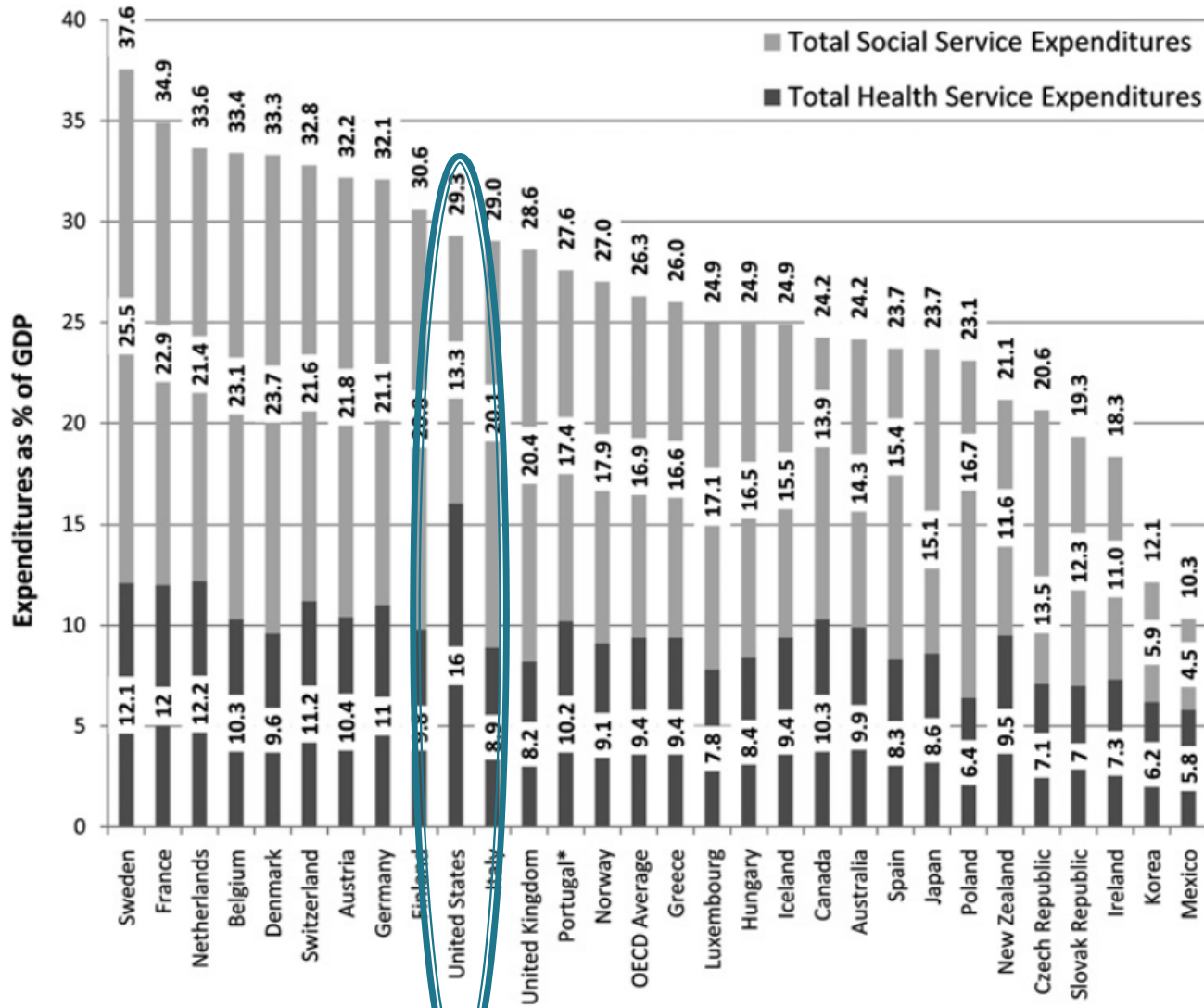


# Problem: America is Not Getting Good Value for Its Health Care Dollar



Prepared for the Robert Wood Johnson Foundation by the Center on Social Disparities in Health at the University of California, San Francisco. Source: OECD Health Data 2007. Does not include countries with populations smaller than 500,000. Data are for 2003. \*Per capita health expenditures in 2003 U.S. dollars, purchasing power parity

# Total Health and Social Services Expenditures OECD Nations, 2005



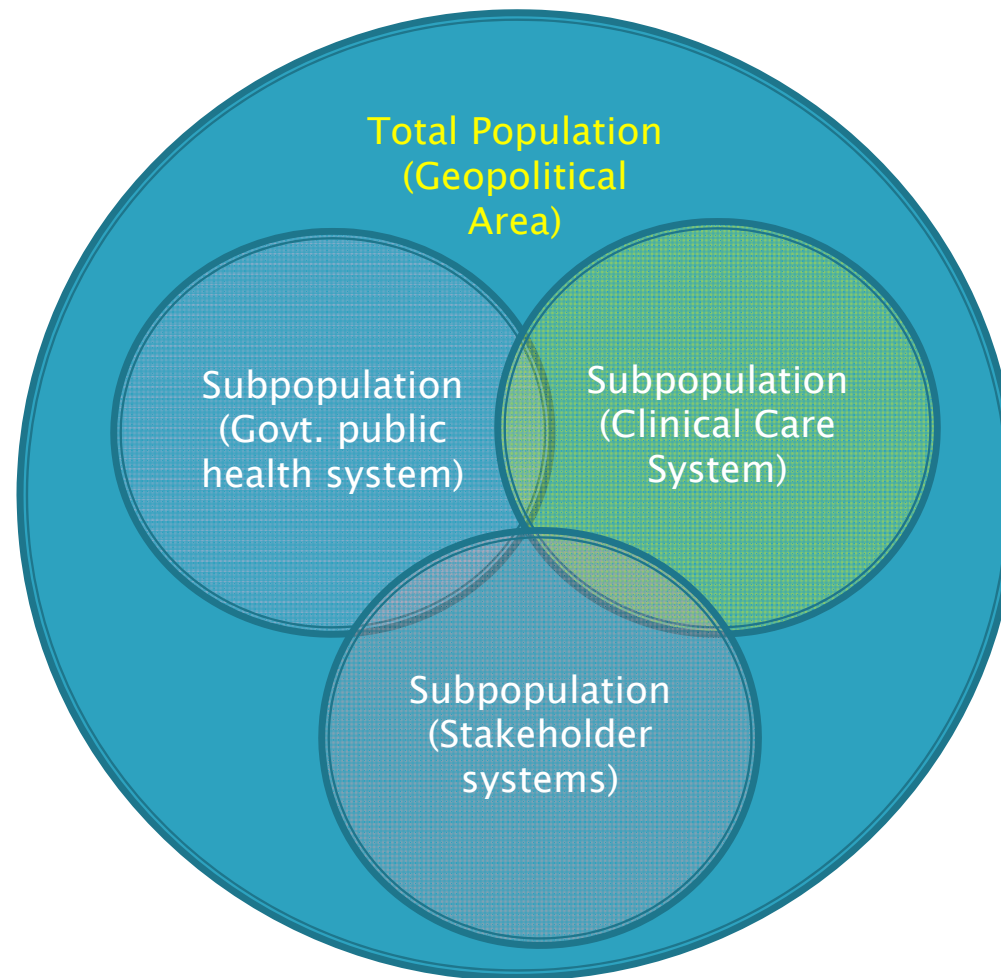
Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

- Preamble to the Constitution of the World Health Organization, 1948

**Public health** is responsible for creating the conditions for people to be healthy

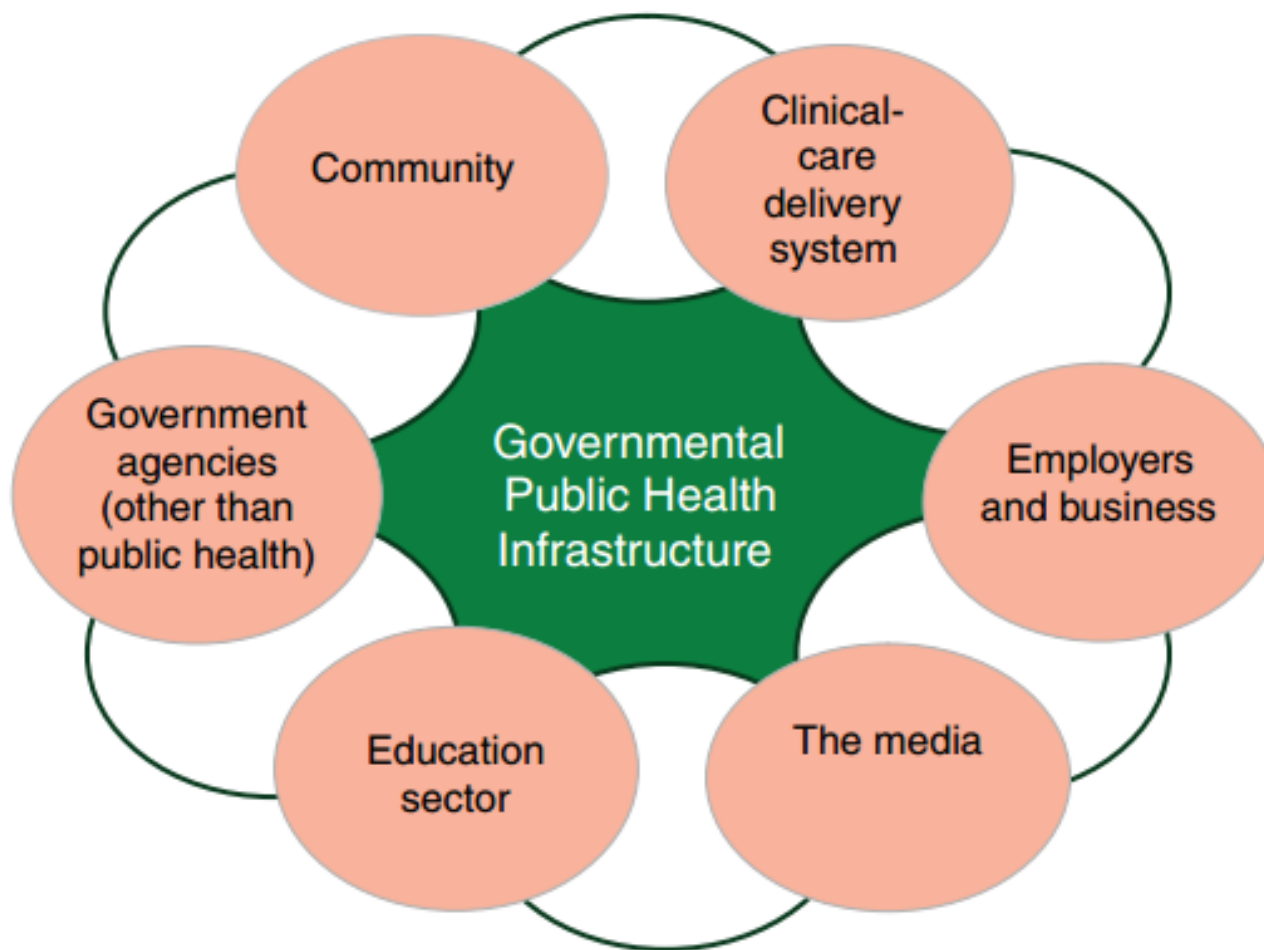


# The Total Population and Subpopulations



Jacobson D, Teutsch S. An Environmental Scan of Integrated Approaches for Defining and Measuring Total Population Health. NQF 2012.

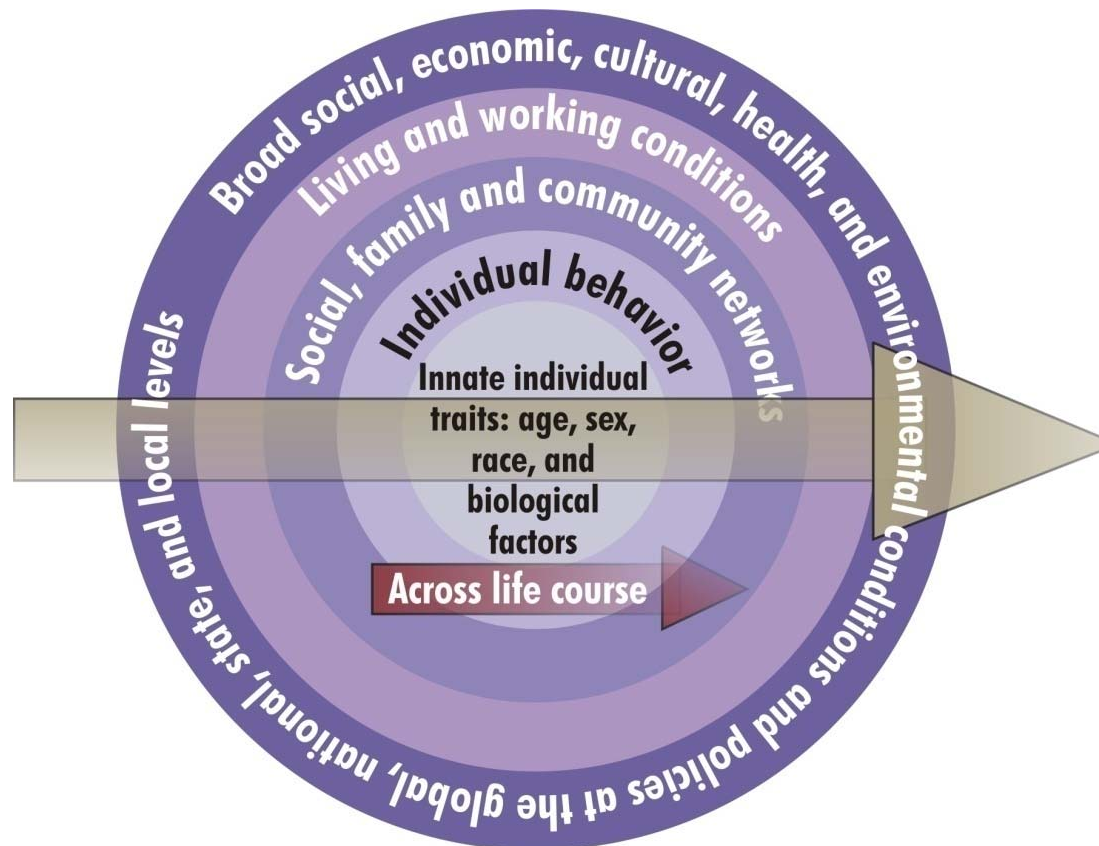
# The Health System





# Ecologic Model of Health

- Policies
- Programs
- Information
- Clinical care




- Behavioral outcomes
- Specific risk factors, diseases, & conditions
- Injuries
- Well-being & health-related Quality of Life
- Health equity

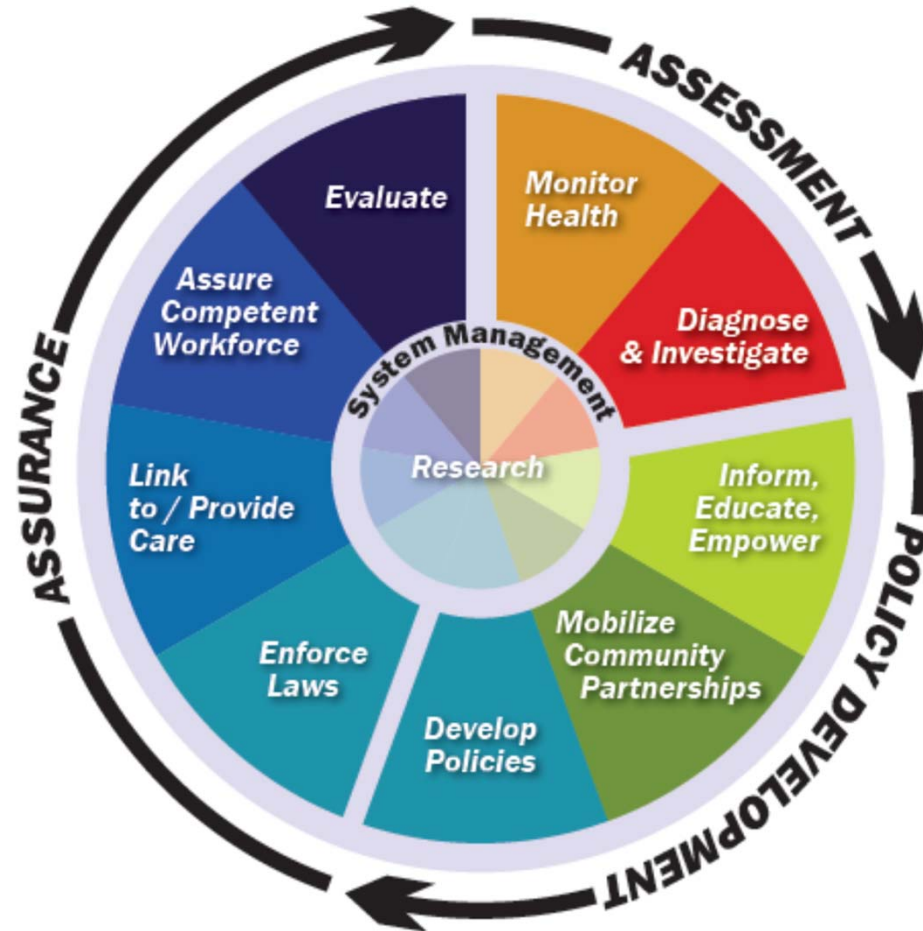
# Healthy People Live in Healthy Communities

- ▶ Meet basic needs of all
  - Safe, sustainable, accessible and affordable **transportation**
  - Affordable, accessible and nutritious **healthy foods**
  - Affordable, high quality, socially integrated and location-efficient **housing**
  - Affordable, high quality **health care**
  - Complete and livable communities including affordable and high quality **schools, parks and recreational facilities, child care, libraries, financial services, and**
  - other daily needs
- ▶ Quality and sustainability of **environment**
- ▶ Adequate levels of **economic and social development**
- ▶ Social and health **equity**
- ▶ **Social relationships** that are supportive and respectful

Adapted from: Linda Rudolph and the California Strategic Growth Council,  
Health In All Policies Task Force



# Core Public Health Functions and Essential Services



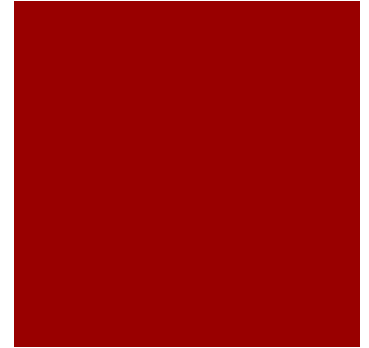
<http://www.cdc.gov/nphpsp/essentialservices.html>



## **Can Healthcare Reform Transform Eye Health in the United States?**

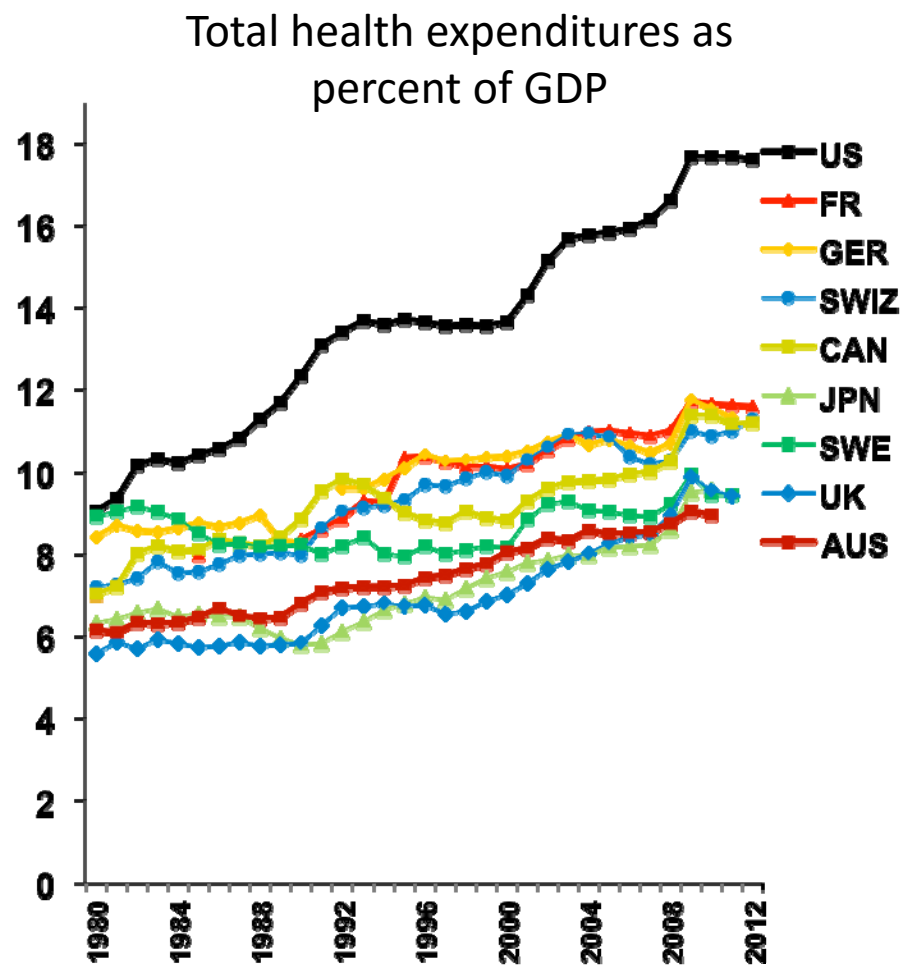
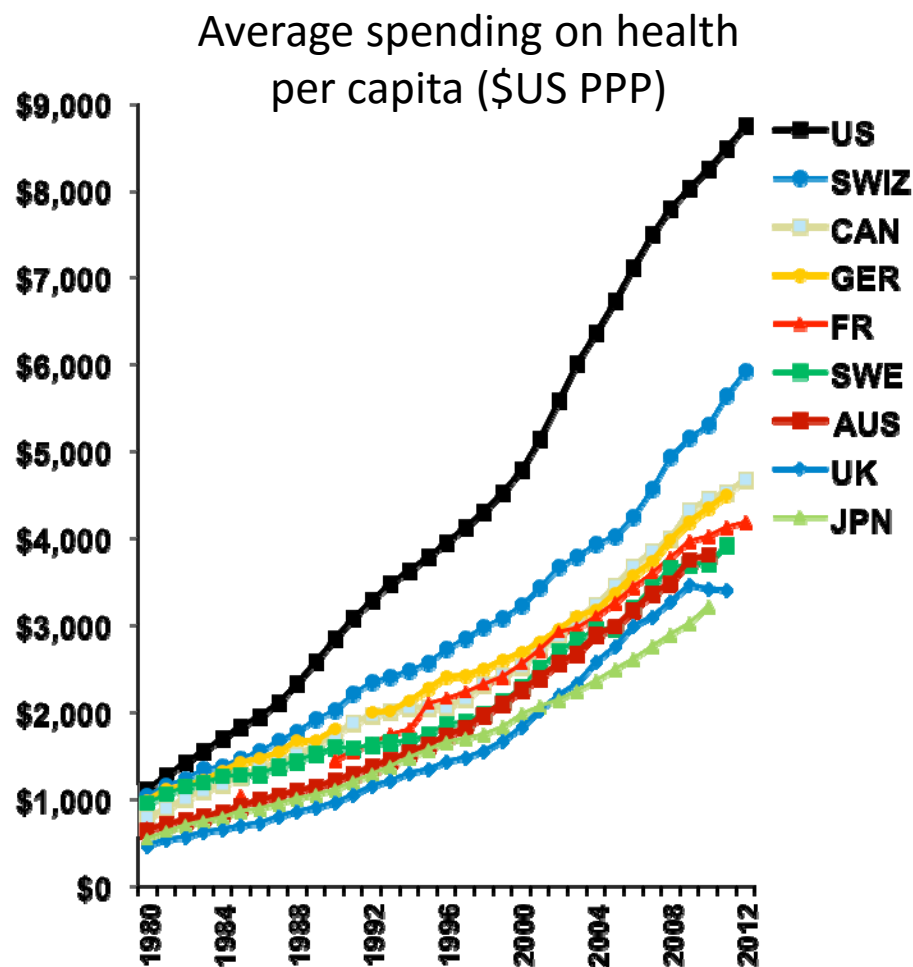
Eve J. Higginbotham SM, MD  
Vice Dean, Perelman School of Medicine  
Senior Fellow, Leonard Davis Institute  
Professor, Ophthalmology  
University of Pennsylvania

# Can Healthcare Reform Transform Eye Health in the United States?



- The Broad Context for Healthcare Reform
- Measurable Advances following the Passage of the Affordable Care Act
- Implications of the Medicare Access & CHIP Reauthorization Act of 2015 (MACRA)
- Important Role of Prevent Blindness

## U.S. Spending Higher: Health Spending in Selected OECD Countries, 1980–2012



Note: PPP = Purchasing power parity.

Source: Commonwealth Fund, from OECD Health Statistics 2014.  
Available at <http://www.oecd.org/els/health-systems/health-data.htm>.

# Health Disparities Persist

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- ◆ **Systemic structural and institutional factors contribute significantly to disparities in health<sup>1</sup>**
- ◆ **Age, ethnicity, sex, and chronic health conditions contribute to disparities in vision impairment and age related eye diseases<sup>2</sup>**
- ◆ **Visual impairment related to glaucoma and diabetic retinopathy is more common among African Americans and Latinos compared to non Hispanic whites<sup>3</sup>**

1. IOM (Institute of Medicine). 2003. Unequal treatment: Confronting racial and ethnic disparities in health care. Washington, DC: The National Academies Press.
2. Gohdes DM, Balamurugan A, Larsen BA, Maylahn C. Age-related eye diseases: an emerging challenge for public health professionals. *Prev Chronic Dis* 2005;2:A17.
3. Ryskulova A, Turczyn K, Makuc DM, Cotch MF, Klein RJ, Janiszewski R. Self-reported age-related eye diseases and visual impairment in the United States: results of the 2002 national health interview survey. *Am J Public Health* 2008;98:454Y61.

# Visual Impairment Has an Emotional Impact

- **≥70% of people fear blindness more than**
  - being deaf
  - having to use a wheelchair
  - losing a limb<sup>1</sup>
- **Only cancer and heart disease are feared more<sup>2</sup>**
- **Patients with severe vision loss (≥20/200) would trade 39% of their remaining years for permanent normal vision<sup>3</sup>**
  - Similar to patients with moderate to severe stroke, severe angina, pre-surgical ulcerative colitis, and severe tuberculosis<sup>3</sup>
- **Current health, sustainability of health, and subjective well being are important population health metrics<sup>4</sup>**

1. R. *Statistics on Vision Impairment: A Resource Manual*. 2002.

2. Glaucoma Research Foundation. *Glaucoma Facts*.

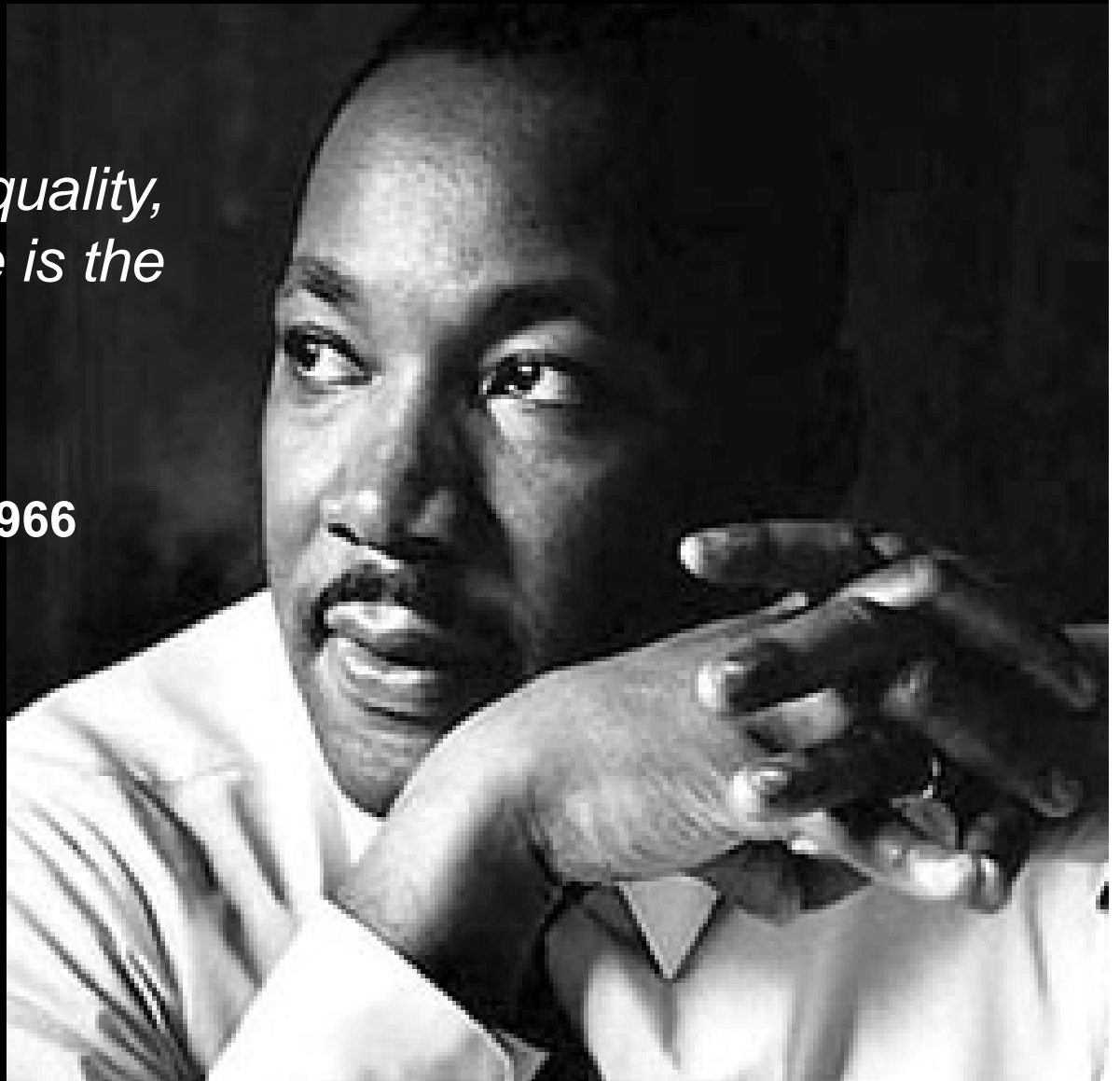
3. Brown MM, et al. *Ophthalmology*. 2003;110:1076-1081

4. Kottke, T. E., J. M. Gallagher, S. Rauri, J. O. Tillema, N. P. Pronk, and S. M. Knudson. 2016. **New summary measures of population health and well-being for implementation by health plans and accountable care organizations**. National Academy of Medicine, Washington, DC



*Of all the forms of inequality,  
injustice in health care is the  
most shocking and  
inhumane.*

**Martin Luther King, Jr., 1966**



*Courtesy of Joan Reede, MD, MPH, MBA2010*

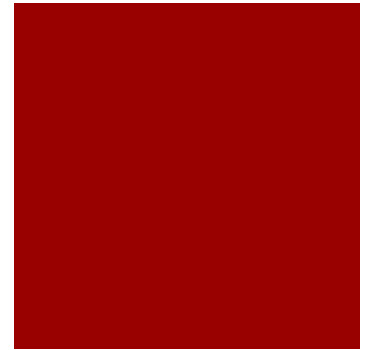
# The Affordable Care Act Broadly Impacts the HealthCare



|       |   |
|-------|---|
| I.*   | Quality, Affordable Health Care for All Americans                 |
| II.*  | Medicaid Expansion  |
| III.* | Improving the Quality and Efficiency of Health Care               |
| IV.*  | Prevention of Chronic Disease and Improving Public Health         |
| V.*   | Health Care Workforce – Supports training of Primary care Doctors |

\*Pertinent to Eye Health Initiatives

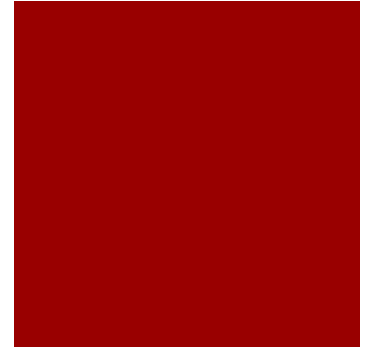
# The Affordable Care Act Broadly Impacts HealthCare



|       |   |
|-------|---|
| VI    | Transparency and Program Integrity –Reporting of gifts to physicians, state-driven changes to litigation of medical malpractice |
| VII*  | Improving access to innovative medical technologies   |
| VIII* | Community living assistance services and supports   |
| IX*   | Revenue Provision, e.g. excise tax on cosmetic services, medical device tax on the device manufacturing sector                  |
| X     | Reauthorization of the Indian Health Care Improvement Act   |

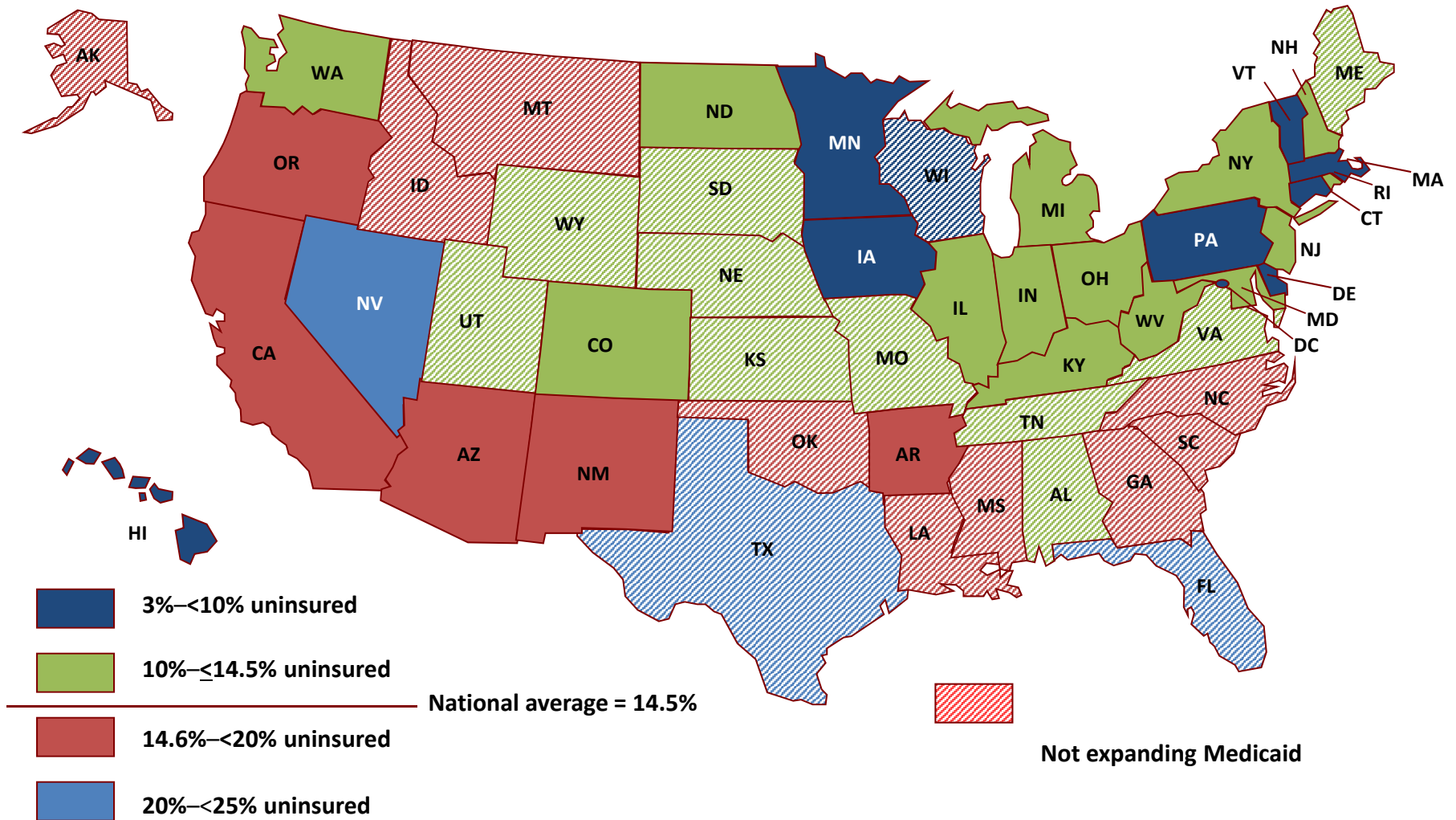
\*Pertinent to Eye Health Initiatives

# Specific Positive Impactors of the Affordable Care Act to Eye Health



- Expansion of Medicaid
- Increased use of Electronic Medical Records
- Use of Evidence-Based Practice Guidelines
- Ambulatory Surgery Centers Become Attractive Models for Outpatient Surgical Procedures
- Pediatric Vision Exams are Reimbursed - Mandated

# Although the Proportion of Uninsured Has Been Reduced, the Number of Uninsured Individuals Remains High

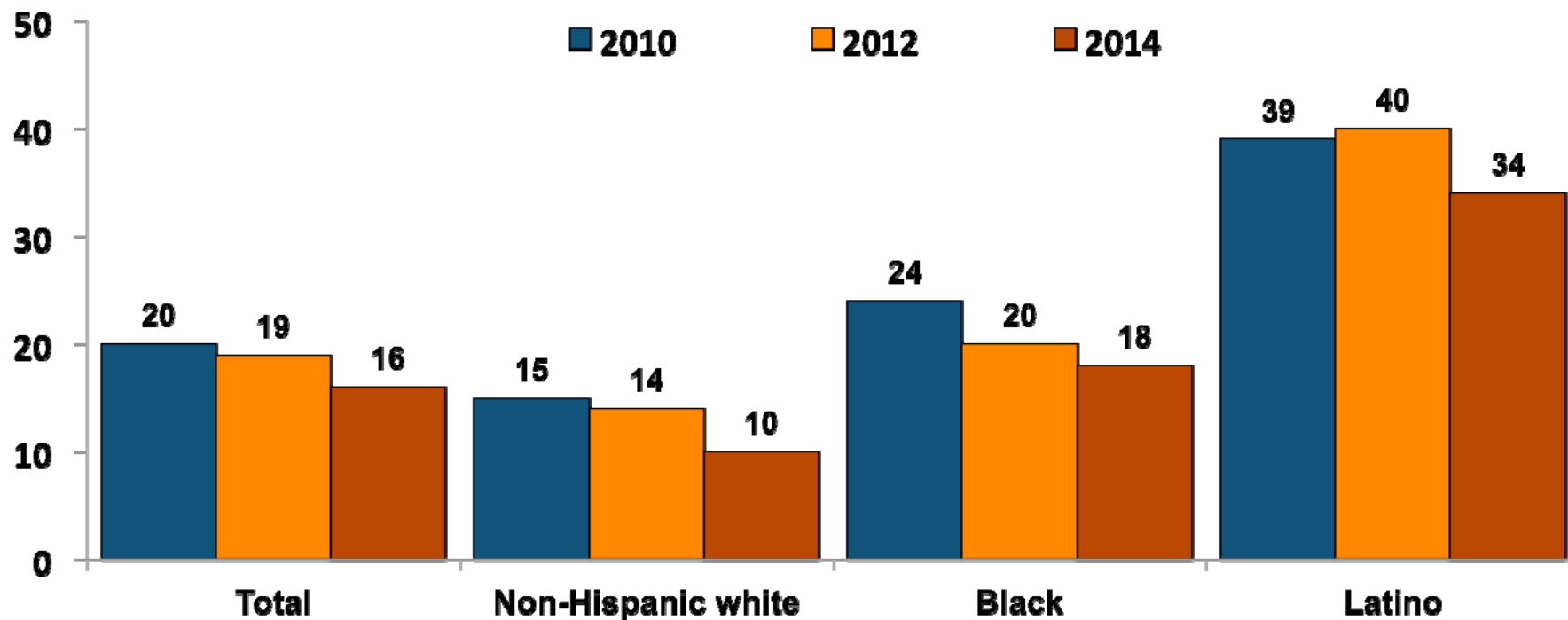


Source: *Health Insurance Coverage in the United States: 2013*. U.S. Census Bureau, 2012 and 2013 1-year American Community Surveys.



## Uninsured Rates Declined Among Whites, Blacks, and Latinos in 2014

Percent of adults ages 19–64 who are uninsured



Source: The Commonwealth Fund Biennial Health Insurance Surveys (2010, 2012, and 2014)

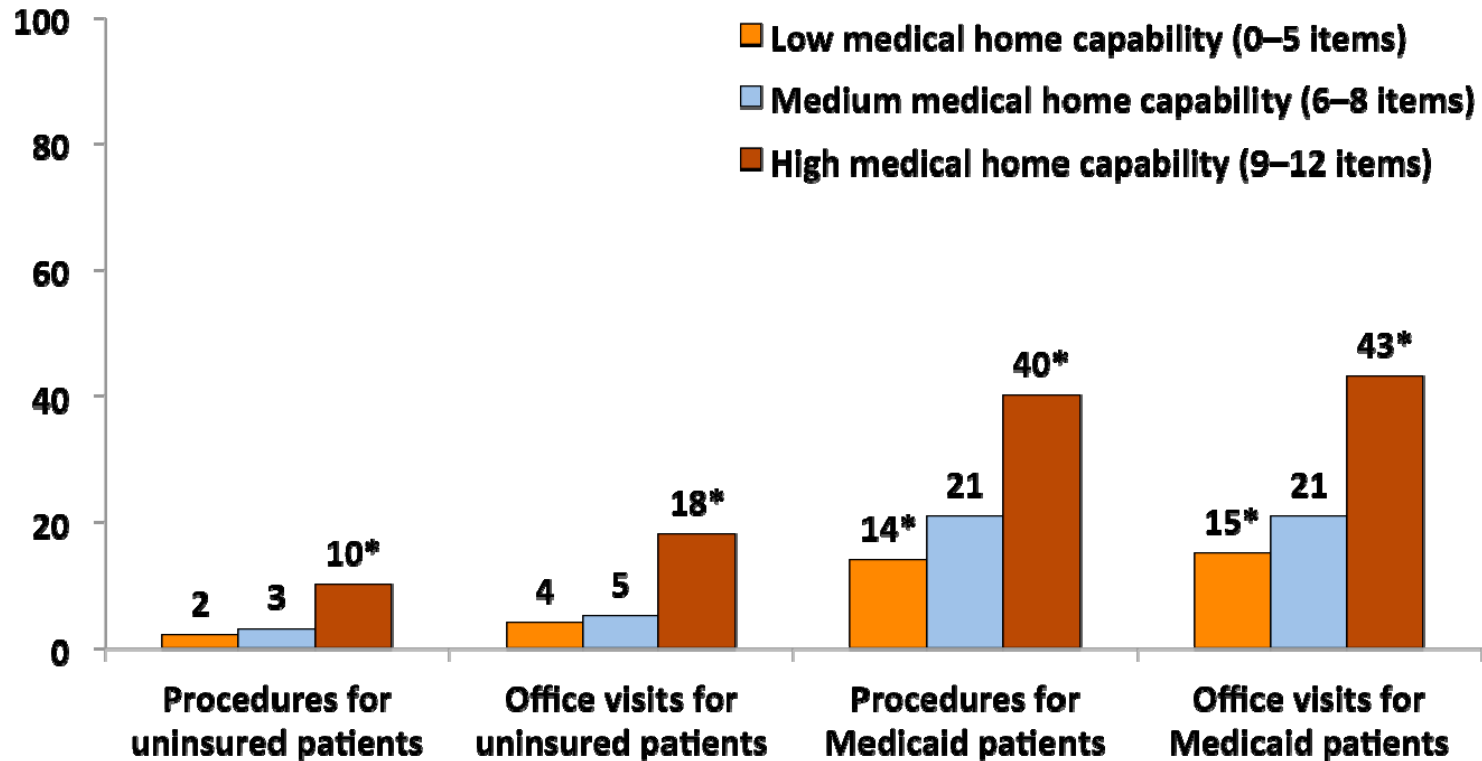


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## Medical Homes Provide Greater Access to Specialist Office Visits and Procedures

Percent of FQHCs reporting they can easily obtain the following:



Medical home capability is defined using a 12-item set of advanced functions from six categories: access/communication, patient tracking/registry, care management, test/referral tracking, quality improvement, and external coordination.

\*  $p < 0.05$ , referent to medium capability.

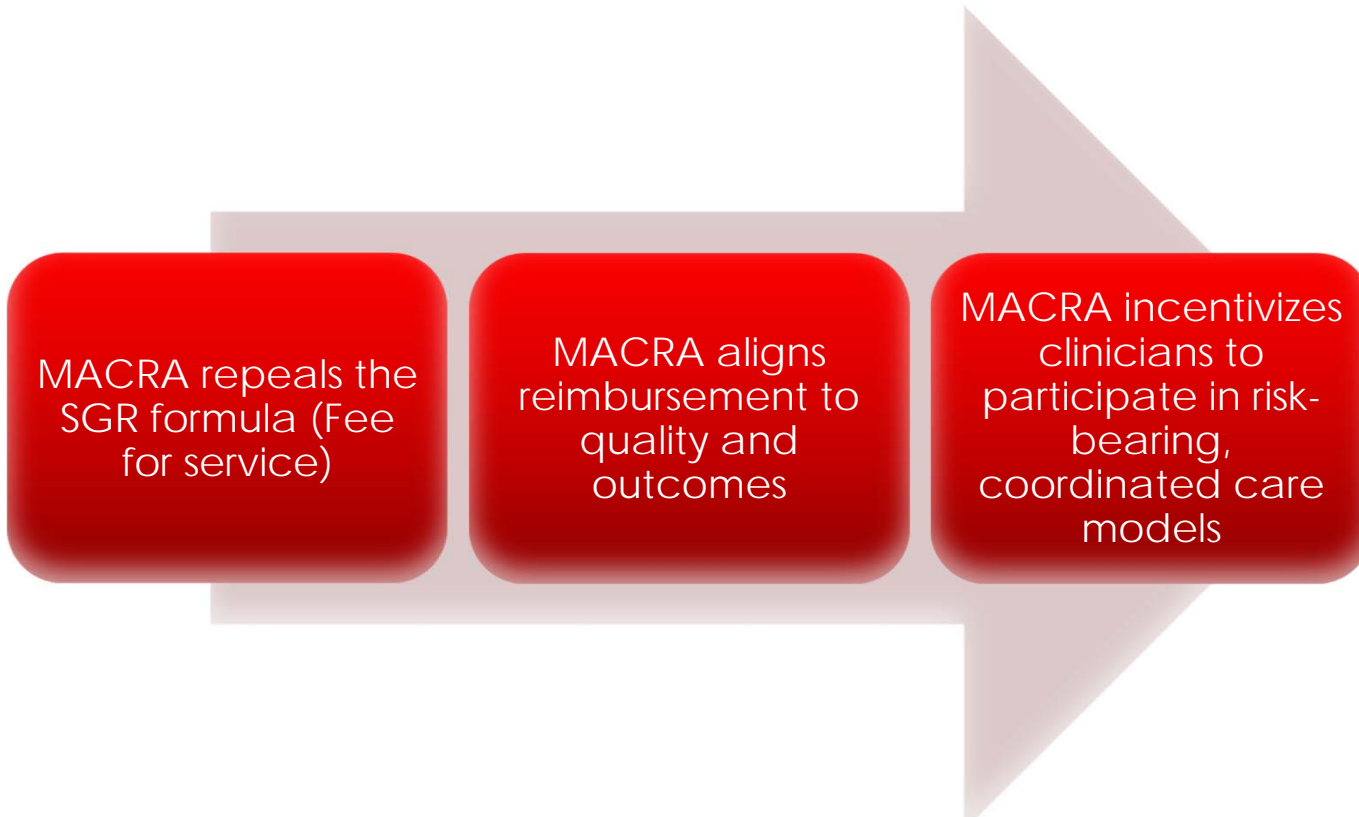
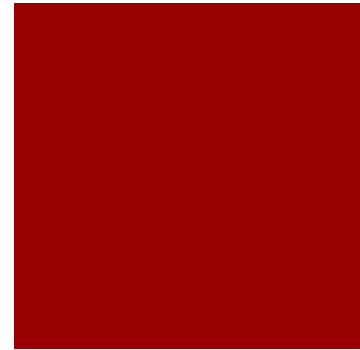
Source: The Commonwealth Fund 2009 and 2013 Surveys of Federally Qualified Health Centers.



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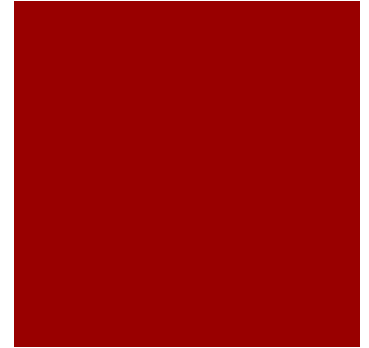
# Medicare Access and CHIP Reauthorization Act (MACRA): New Medicare Payment Law that aims to fundamentally change the health care payment system



<http://www2.deloitte.com/us/en/pages/life-sciences-and-health-care/articles/macra.html>, Accessed July 8, 2016



# Emphasis on Population Health May Negatively Impact Eye Health Unless...



- Eye health is advanced as an integral component of population health
- Eye care providers become better integrated into health systems
- Access to preventive services is optimized
- Efforts related to health promotion are intensified
  - important role of **Prevent Blindness**
    - Particularly in the areas of prevention, need for care, access to care, and chronic eye disease education

# Can Healthcare Reform Transform Eye Health in the United States?

- Only if we are prepared as a community



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# Global Burden of Disease and Access to Care for Vulnerable Populations

Sandra S. Block, OD, M Ed MPH  
Professor, Illinois College of Optometry



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## Presenter Disclosures

The author has no financial relationships with commercial interests relevant to this presentations to disclose.



## What drove me to be a part of the NASME?

- I have been an eye care provider for more than 30 years. My experiences have peaked my interest in public and population health.
- My professional path has taken me to work with populations that typically poor advocates for themselves.
  - Infants, toddlers, preschoolers, and school aged adolescents in Illinois
  - Children and adults with disabilities across the globe
- Studies have shown people with intellectual disability and developmental disability world wide have poor access to eyecare.
  - Life expectancy for this group has changed from 9 years to more than 50 years of age with the advancement of health care. (though not universal for all races)
- In 1995, we looked at a small population of 900 SO athletes and found that only 33% of those reported having an eye exam in the past 3 years.



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## 2010 Global Burden of Disease (WHO)

- 285 million people are visually impaired
- Of those, 39 million are blind and 246 receive low vision services
- Of this enormous number, up to 80% of these individuals have preventable causes of visual impairment and blindness
- 90% of visually impaired and blind individuals reside in developing countries



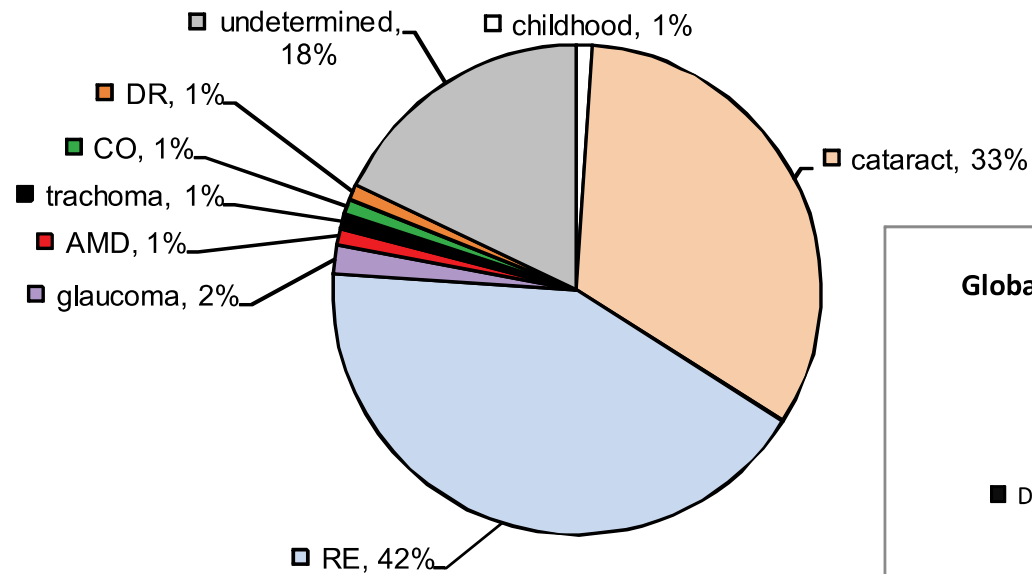
## Global Burden of Disease

- While the data has showing some improvement in the prevalence in total amount of blindness, there are some issues that are concerning.
- We have heard at a previous PB Summit of the disparities that are felt by women. The study showed that 60% of blindness is found in women.
- Other inequities exist but before we address these at-risk groups I wanted to remind everyone of the primary causes vision loss.

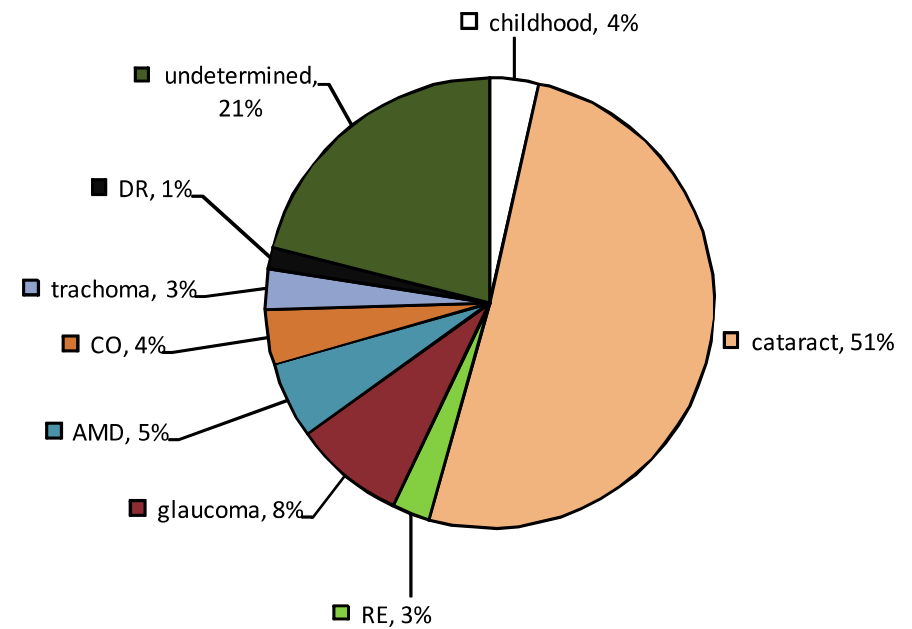


# Global Burden of Disease

Global causes of Visual Impairment, inclusive of blindness, as percentage



Global causes of blindness as percentage of global blindness in 2010.





## Global Burden of Disease

- The data was analyzed by looking at three age groups: children (0-14), adults (15-49) and adults over 49 years of age. The data reflects the changing demographics:

| Ages<br>(in years)  | Population<br>(millions) | Blind<br>(millions)  | Low Vision<br>(millions) | Visually Impaired<br>(millions) |
|---------------------|--------------------------|----------------------|--------------------------|---------------------------------|
| <b>0-14</b>         | <b>1,848.50</b>          | <b>1.421</b>         | <b>17.518</b>            | <b>18.939</b>                   |
| <b>15-49</b>        | <b>3548.2</b>            | <b>5.784</b>         | <b>74.463</b>            | <b>80.248</b>                   |
| <b>50 and older</b> | <b>1,340.80</b>          | <b>32.16</b>         | <b>154.043</b>           | <b>186.203</b>                  |
| <b>all ages</b>     | <b>6,737.50</b>          | <b>39.365 (0.58)</b> | <b>246.024 (3.65)</b>    | <b>285.389 (4.24)</b>           |



## Vulnerable Populations

- Lower socioeconomic status or poverty
- Developing countries
- Cognitive, physical, mental health or other disability
- Language barriers
- Cost of services
- Transportation
- Ethnicity
- Education level
- Youth and elderly



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## Chicago Public Schools

- Schools - 675
- Enrollment - 404,151
- 41.6% African American, 44.1% Latino
- 87% of the students are from low-income families



## January, 2011 – December, 2013

- 14,929 students received comprehensive eye exams – birth to high school graduation
- 14,663 students were enrolled in CPS
- Students were referred by school due to failing a vision screening, lost glasses, teacher referral, or parent request



## Demographics

| Characteristics        | Clinic Patients | Sending Schools | All CPS |
|------------------------|-----------------|-----------------|---------|
| Black/African American | 60.6%           | 57.9%           | 41.4%   |
| Latino/Hispanic        | 35.4%           | 37%             | 44.7%   |
| Male                   | 45.7%           | 50.4%           | 50.3%   |
| Special Education      | 21%             | 12.9%           | 12.6%   |
| Free/Reduced Lunch     | 94.3%           | 88.7%           | 83.5%   |
| Neighborhood Poverty   | 0.489           | 0.462           | 0.205   |

## Pretreatment Academic Indicators

| Characteristics           | Clinic Patients | Sending School | All CPS |
|---------------------------|-----------------|----------------|---------|
| Attendance                | 94%             | 93.4%          | 93%     |
| Grade Point Average (GPA) | 2.42            | 2.49           | 2.58    |
| Math Scores               | -0.324          | -0.161         | 0.019   |
| Reading Scores            | -0.317          | -0.149         | 0.015   |



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## CCSR - University of Chicago Consortium on Chicago School Research

- MOU with CPS – data sharing for standardized tests, GPAs, along with other academic measures.
- IEI at Princeton contracted with CCSR to analyze the impact of attending IEI at Princeton on academic performance.
- Vision data was matched to academic data by student ID numbers (unique identifiers).



## Notes of Interest

- ~50% of students presenting reported a previous prescription.
- 86% of students who reported having glasses presented for an exam without them.
- 35% had entering VA's poorer than 20/40





## Results

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- High School students: A significant positive effect (0.045,  $p=0.03$ ) was seen for reading.

Math scores:

- Elementary students: A significant positive effect (0.015,  $p=0.045$ ) was observed for math scores.
- High School students: A significant positive effect (0.073,  $p=0.00$ ) was seen for math.
- Latinos:
  - Reading scores improved



## Conclusion

- Corrective lenses improve academic performance
- The effect may be more significant than we found due to the fact that we had no control of lens wear.
- The effect was lost in the second year which may be attributed to change in prescription, loss of glasses, or simply stopped wearing them



## What are some of the challenges that we need to address?

- We need to ensure that all individuals who need eye care can receive quality eyecare?
- How best can we identify those in greatest need?
  - Better surveillance on the prevalence of eye health and vision problems in vulnerable population - National Center on Children's Vision and Eye Health is committed to improved documentation of vision services
  - Research on how to prevent or reduce the progression of vision problems



# What are some of the challenges that we need to address?

- Improvements on identifying those at greatest risk for visual impairment and blindness –
  - Screenings -
  - New Technology
  - Comprehensive eyecare
- Improved access to quality eyecare
- Equity in services



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# Thank you!

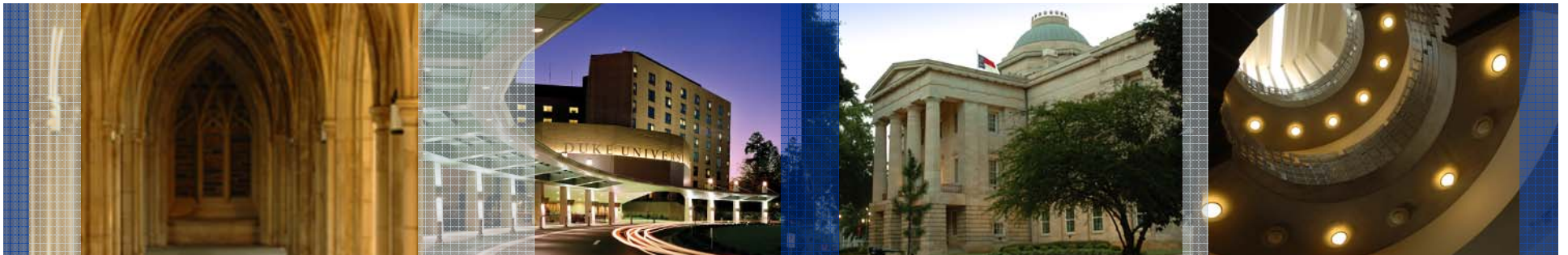
[sblock@ico.edu](mailto:sblock@ico.edu)



ICO

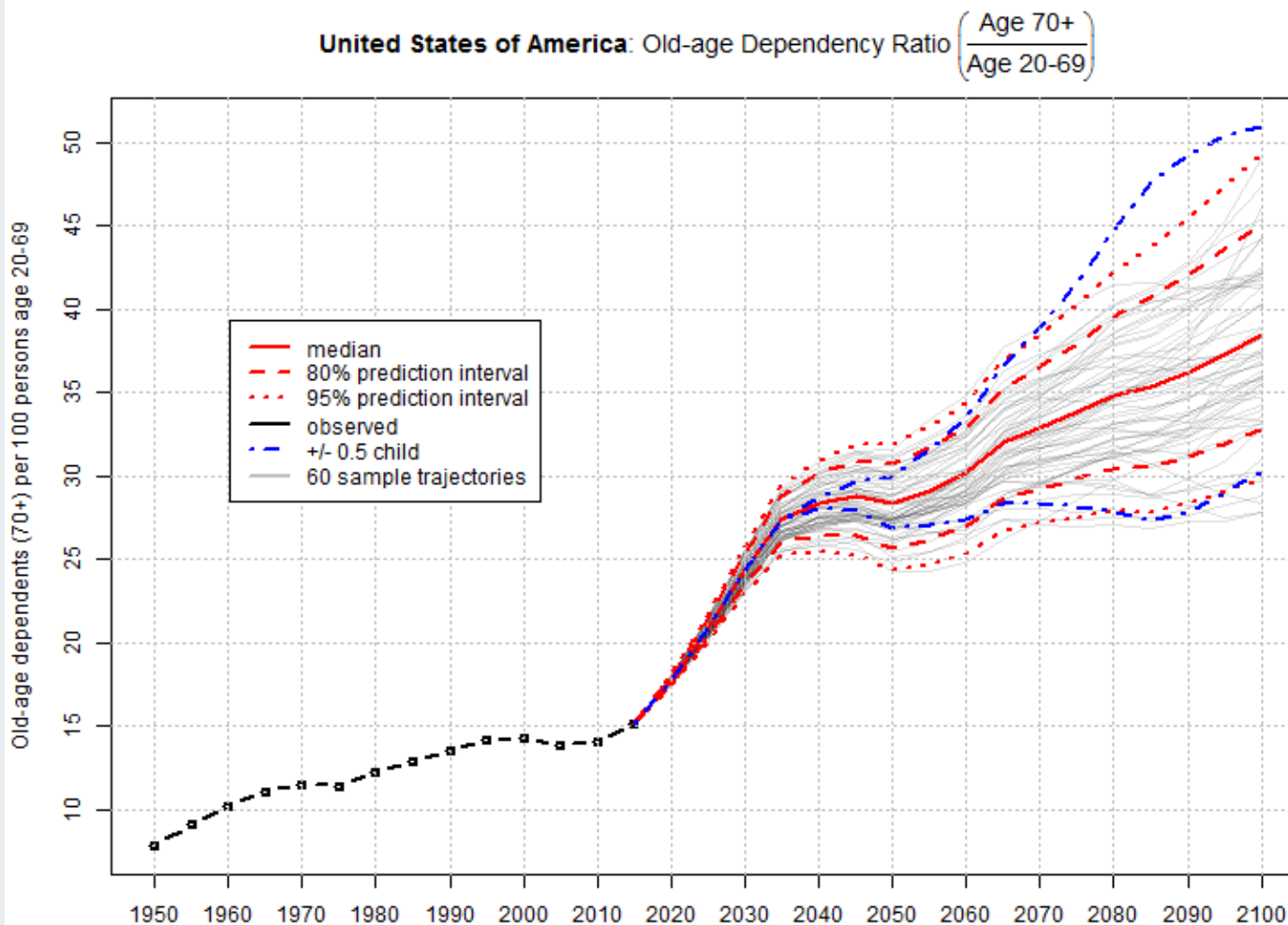
# Vision Impairment in the Aging Population

Heather E. Whitson, MD, MHS  
Duke University Medical Center





# The “Silver Tsunami” has arrived



Source: United Nations, Department of Economic and Social Affairs, Population Division (2015).  
*World Population Prospects: The 2015 Revision*. <http://esa.un.org/unpd/wpp/>



## Prevalence of Chronic Vision Impairment in the U.S. is strongly age-related

| Age (years) | Legal Blindness |     | Uncorrectable Low Vision |      | All Visually Impaired |      |
|-------------|-----------------|-----|--------------------------|------|-----------------------|------|
|             | Persons         | %   | Persons                  | %    | Persons               | %    |
| 60-69       | 59,000          | 0.3 | 176,000                  | 0.9  | 235,000               | 1.2  |
| 70-79       | 134,000         | 0.8 | 471,000                  | 3.0  | 605,000               | 3.8  |
| ≥80         | 648,000         | 7.0 | 1,532,000                | 16.7 | 2,180,000             | 23.7 |

Data from National Health Interview Survey

Lee DJ et al., *Arch Ophthalmol.* April 2004;122(4):506-509

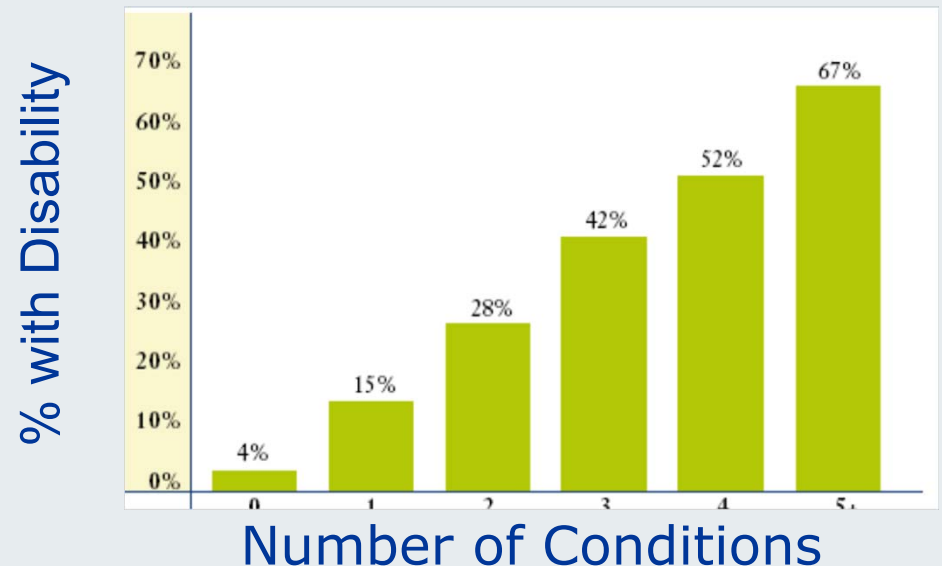




## The Ultimate Geriatric Syndrome: Multiple Chronic Conditions (MCC)

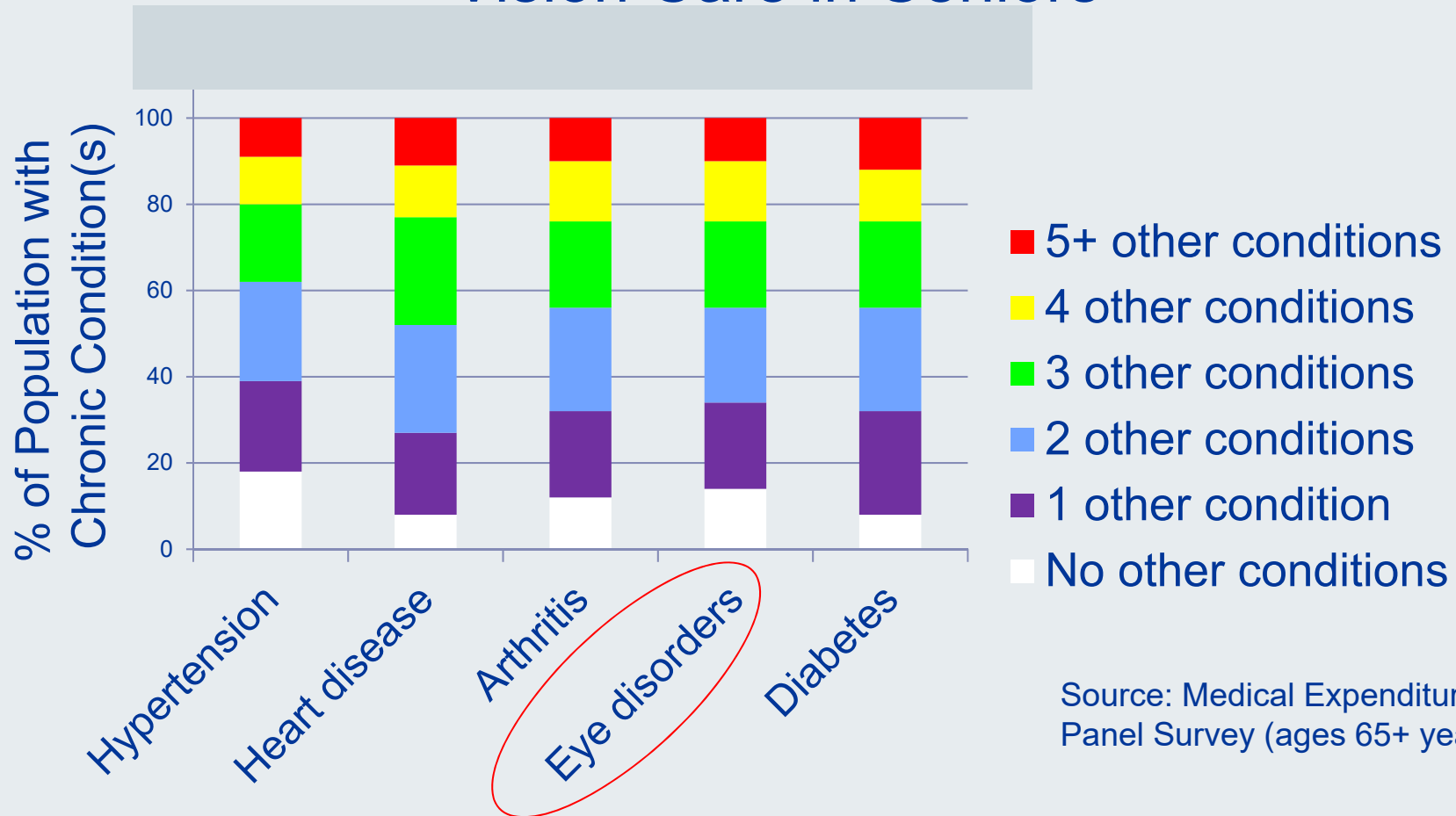
- MCC is Common
  - 2/3 of Medicare population has 2 or more chronic conditions
  - 23% have 5 or more chronic conditions
- Patients with MCC are at increased risk for
  - Hospitalization
  - Complications
  - Disability
  - Institutionalization
  - Death

Source: Medical Expenditure  
Panel Survey 1998 (N=24,072)





# MCC is the Rule, not the Exception, in Eye and Vision Care in Seniors



Source: Medical Expenditure Panel Survey (ages 65+ years)

Anderson & Horvath. *Public Health Reports* 2004



## Comorbidities that are especially common in seniors with vision impairment

- Depression
- Hearing Impairment
- Cognitive Impairment
- Balance Impairment/Falls

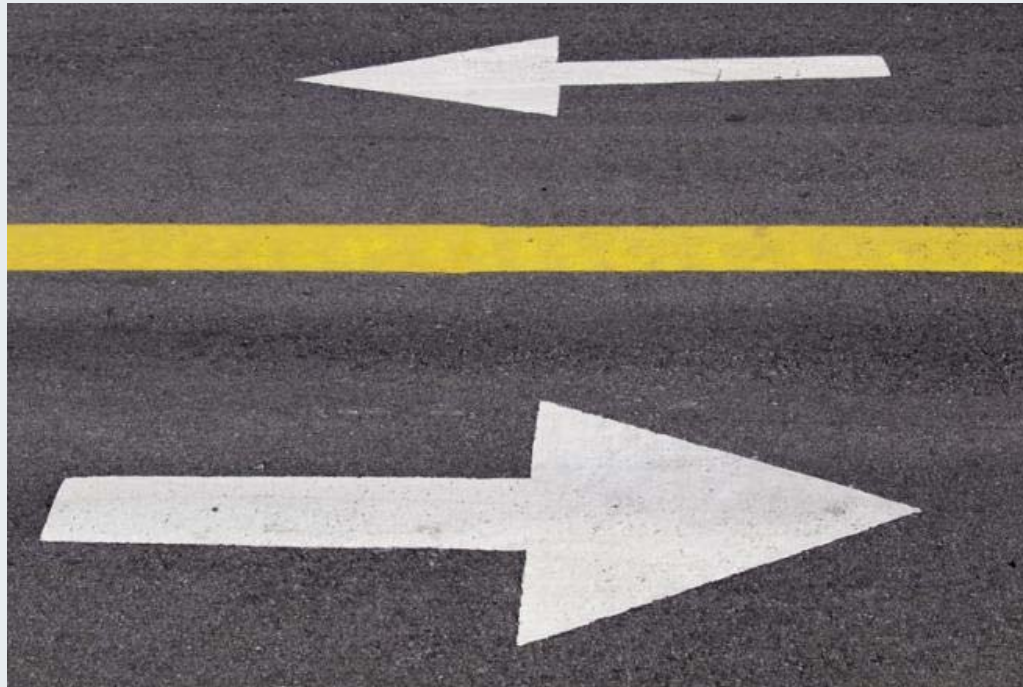
Brody et al. Ophthalmology 2001  
Ee-Munn et al. Archives of Ophthalmology 2006  
Lin et al., J Am Geriatr Soc 2004  
Klaver CC et al., Am J Epidemiol 1999  
Whitson HE et al., Arch Gerontol Geriatr 2010  
Lord SR et al., Clin Geriatr Med 2010





# The Challenge of Comorbidity and Vision Health is a Two-Way Street

Comorbidity  
affects  
treatment  
plans and  
outcomes for  
eye disease

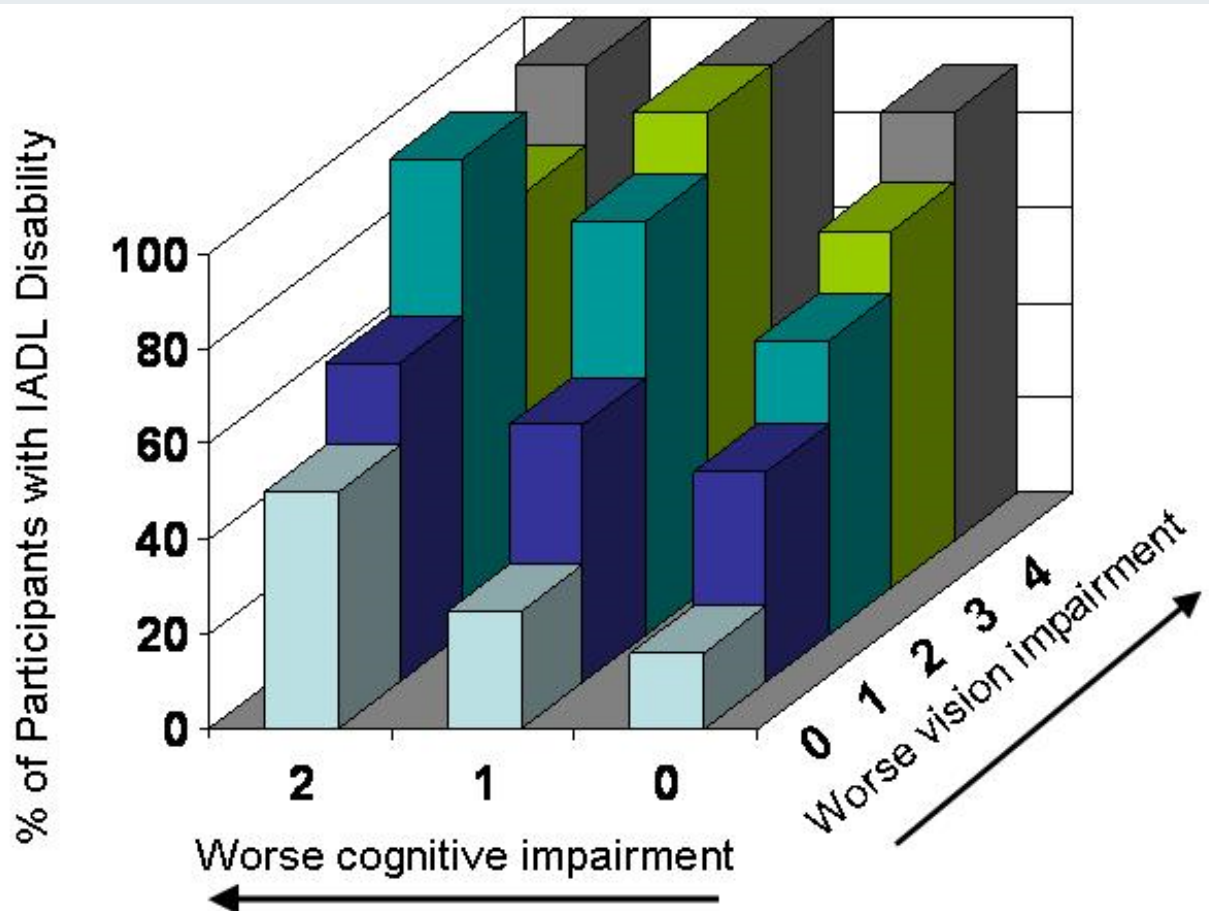


Poor vision  
affects patient  
experience  
and ability to  
care for other  
chronic  
conditions



# The Double Whammy Effect on Health

## Disability Rates in Comorbid Vision and Cognitive Impairment



Whitson et al. *J Amer Geriatr Soc* 2007



## Patients with Multiple Chronic Conditions Still Really Value Vision

- 390 patients with ocular disease (ages 27 to 89)
  - 250 with “serious” comorbid illness (DM, heart disease, ESRD, cancer, or stroke)
- Time trade-off utility questions
  - E.g., how many years of remaining life would you trade for good vision?

**No significant difference** in response in those with vs. without the serious comorbid conditions

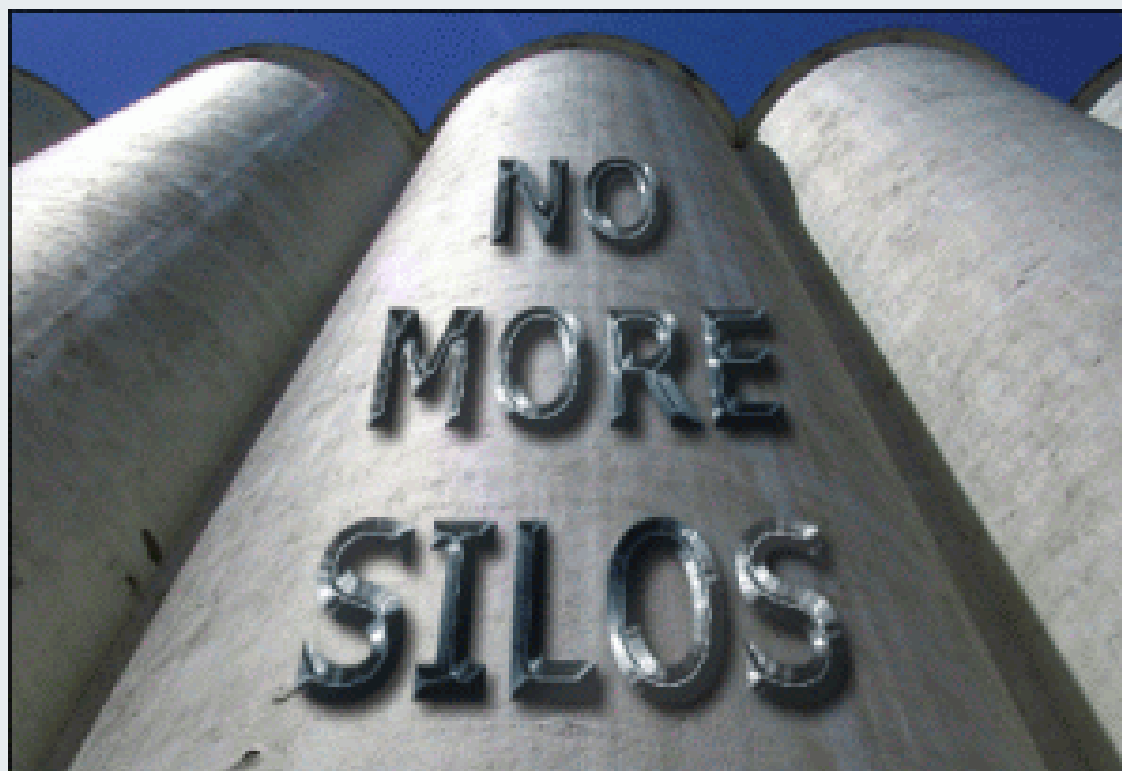
- **Conclusion:** Vision loss is a MAJOR detractor from patient-perceived quality of life, whether or not the patient has serious systemic comorbid disease

MM Brown et al. Br J Ophthalmol 2002



# One Geriatrician's Plea for A Better Way

- Care focused on the (whole) person
- Value driven by patient's goals
- Coordination across disciplines
- Partnering with communities
- Communication that empowers patients and caregivers



 **Prevent  
Blindness**<sup>®</sup>  
Our Vision Is Vision<sup>®</sup>

