

Cost of Vision Problems

The Economic Burden of Vision Loss and Eye Disorders in the United States

Presented by
John Wittenborn

NORC

at the UNIVERSITY *of* CHICAGO

Overview

- The 2007 burden estimate
- Consensus guidelines
- Costs included
- Results
- Sensitivity analyses
- Comparison to the 2007 burden estimate
- Limitations

The 2007 Burden Estimate

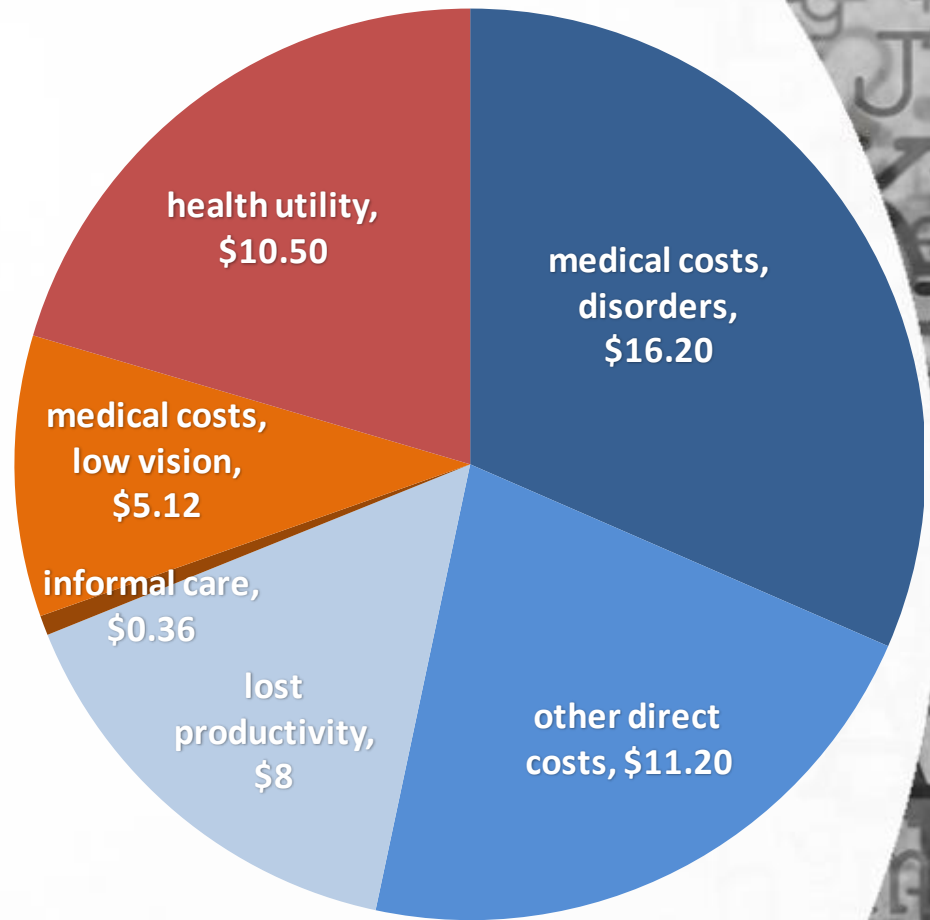
- The Economic Impact of Vision Problems
The Toll of Major Adult Eye Disorders, Visual Impairment and Blindness on the U.S. Economy
 - Released in 2007
 - Based on two separate but complementary studies
 - Rein et al 2006
 - Frick et al 2007

The 2007 Burden Estimate

- Rein et al
 - Calculated direct medical costs from Medicare and MarketScan claims for 4 diseases
 - macular degeneration, cataracts, glaucoma, and diabetic retinopathy
 - Estimated other direct and indirect costs
 - Government programs, long-term care placement, productivity losses
- Frick et al
 - Econometric analysis of MEPS data
 - Medical costs of low vision
 - Informal care costs
 - Loss of well-being

The 2007 Burden Estimate

- \$51.4bn in 2004
 - \$35.4bn from Rein et al
 - \$16bn from Frick et al



The 2007 PBA Burden Estimate

- Limitations

- Did not include the population younger than age 40
- Medical costs limited claims costs of 4 major age-related eye diseases
- Medical claims do not include many vision-related costs
- Estimates based on 2004
 - Data from the 90's and early 2000's

Consensus vision burden guidelines

- Consensus guidelines for economic analyses of vision released in 2010 (Frick et al 2010)
- Defined analysis perspectives and cost categories

Cost Category	Perspective			
	Government	Insurance	Patient	Comprehensive
Direct Costs				
Medical costs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Other health costs	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Aids/adaptations	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Indirect Costs				
Productivity loss	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Caregivers	<input checked="" type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Deadweight loss				<input checked="" type="checkbox"/>
Loss of well-being			<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Updating the economic cost estimate

- CDC-funded a project to estimate economic burden in the population younger than age 40 in 2011-2012
 - Currently online ahead of print in Ophthalmology
- Early 2013 PBA sponsored project to update the costs for the population aged 40 and older

Prevalence of low vision

- Prevalence of low vision for ages 40 and older based on NEI-sponsored meta-analyses of epidemiological studies
 - Best-corrected acuity
- Prevalence of low vision ages 12-39 based on 2005-2008 National Health and Nutrition Examination Survey (NHANES) data
 - Autorefractor corrected acuity
- Prevalence for ages 0-11 imputed from incidence rates

Medical Costs

- 2003-2008 Medical Expenditure Panel Survey (MEPS)
 - Self-reported treated prevalence of medical conditions
 - MEPS assigns 3-digit diagnosis codes
 - Expenditures confirmed by providers
 - Includes expenditures from all payers

Medical Costs

- Diagnosed disorders
 - Costs econometrically attributable to any diagnosis related to vision, eyes, or the ocular adnexa
- Undiagnosed low vision
 - Costs econometrically attributable to self-reported low vision, but no diagnosis
- Vision correction
 - Costs for non-medical optometry visits and vision aids
 - Captured and reported separately by MEPS
 - Calculated using an accounting approach



Other Direct costs

- Low vision aids and devices
- Special education
- School screening
- Dog guides
- Assistance programs



Productivity losses

- Survey of Income and Program Participation
- Median income level by self-reported vision status
 - self-reported difficulty seeing = moderate impairment
 - self-reported inability to see printed words = blindness
- Productivity losses equal to the product of:
 - The reduction in income associated with moderate impairment and blindness
 - the prevalence of moderate impairment and blindness

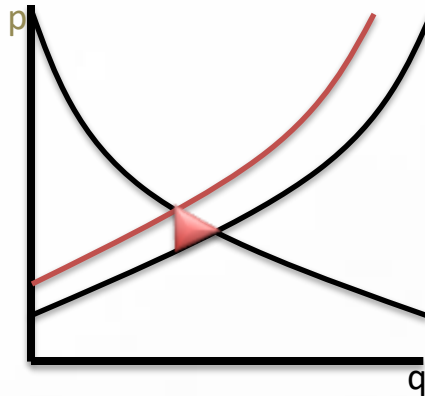


Long-term Care Costs

- **Nursing home costs**
 - Vision attributable long-term care utilization estimated based on data from the National Nursing Home Survey and Baltimore Eye Study
 - Cost of nursing home based on 2011 Genworth Financial Cost of Care Survey
- **Skilled nursing facility**
 - Excess Medicare claims for SNF among persons with low vision

Other indirect costs

- Informal care
- Entitlement programs
- Tax deductions
- Deadweight loss



Loss of well-being and disability

- Disability adjusted life years (DALYs)
 - Disability weights from the recently released Global Burden of Disease Project
- Quality adjusted life years (QALYs)
 - Alternative measure
 - Based on utility estimates in the literature

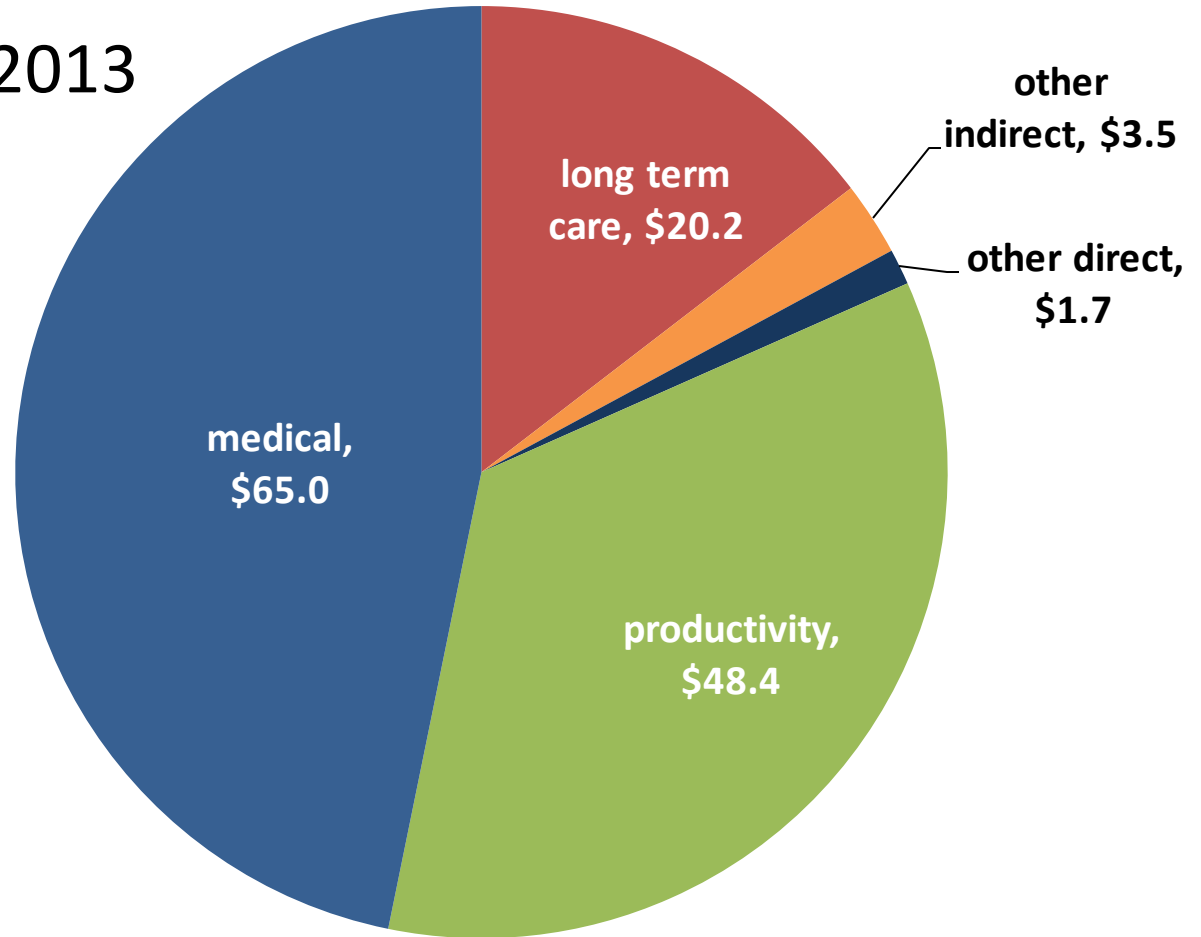
RESULTS

FOCUS ON EYE HEALTH
National Summit

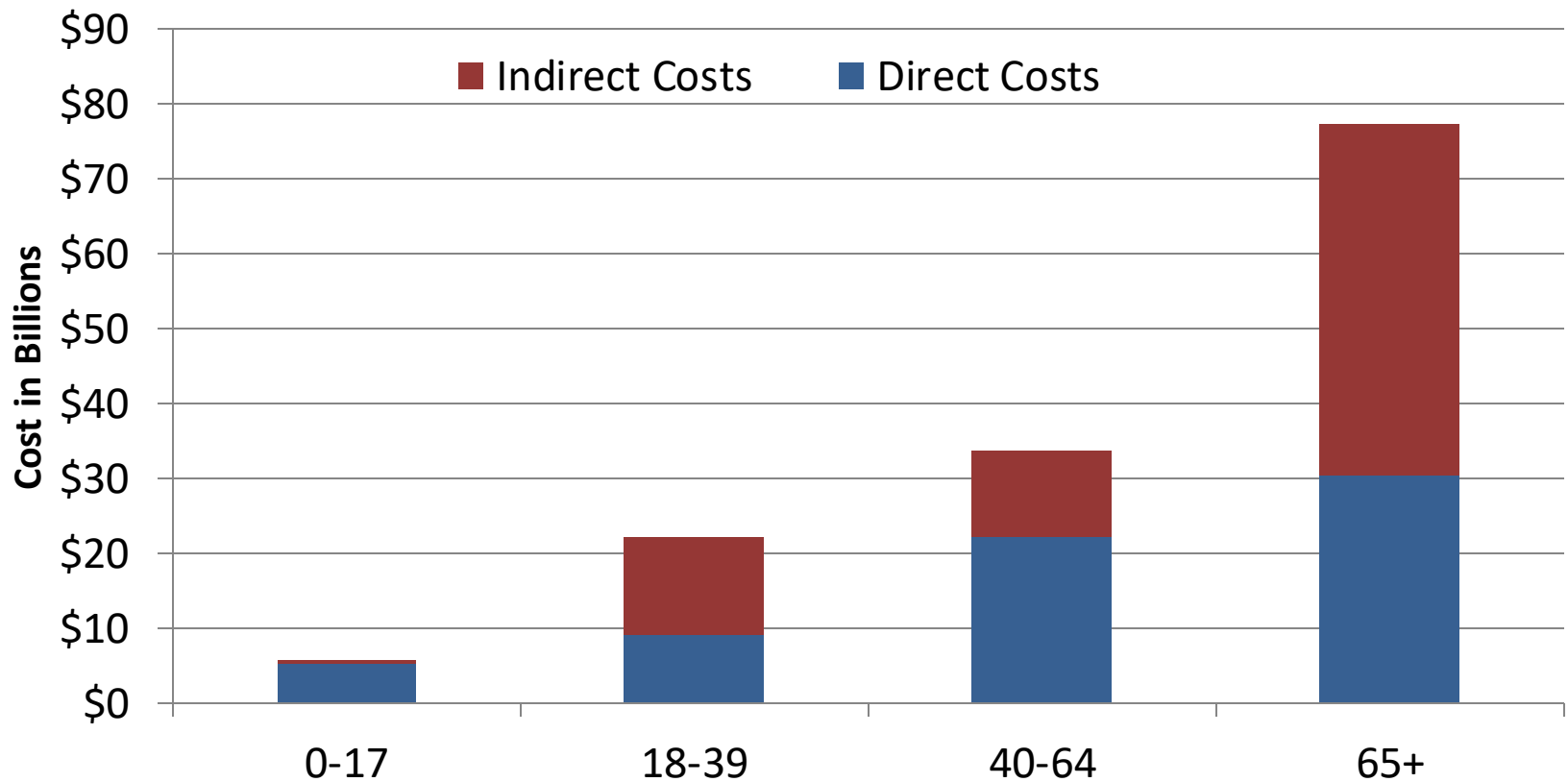


The 2013 burden estimate

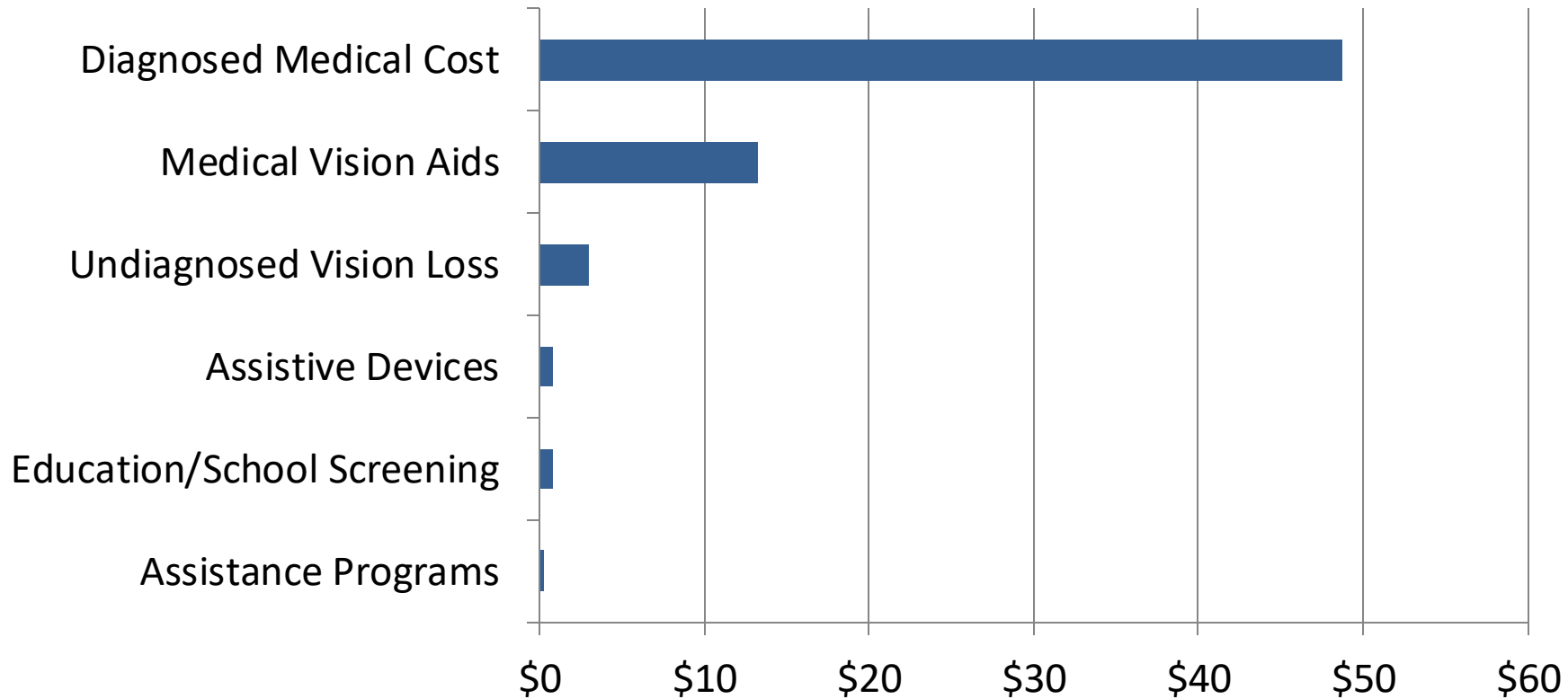
- \$139 billion in 2013



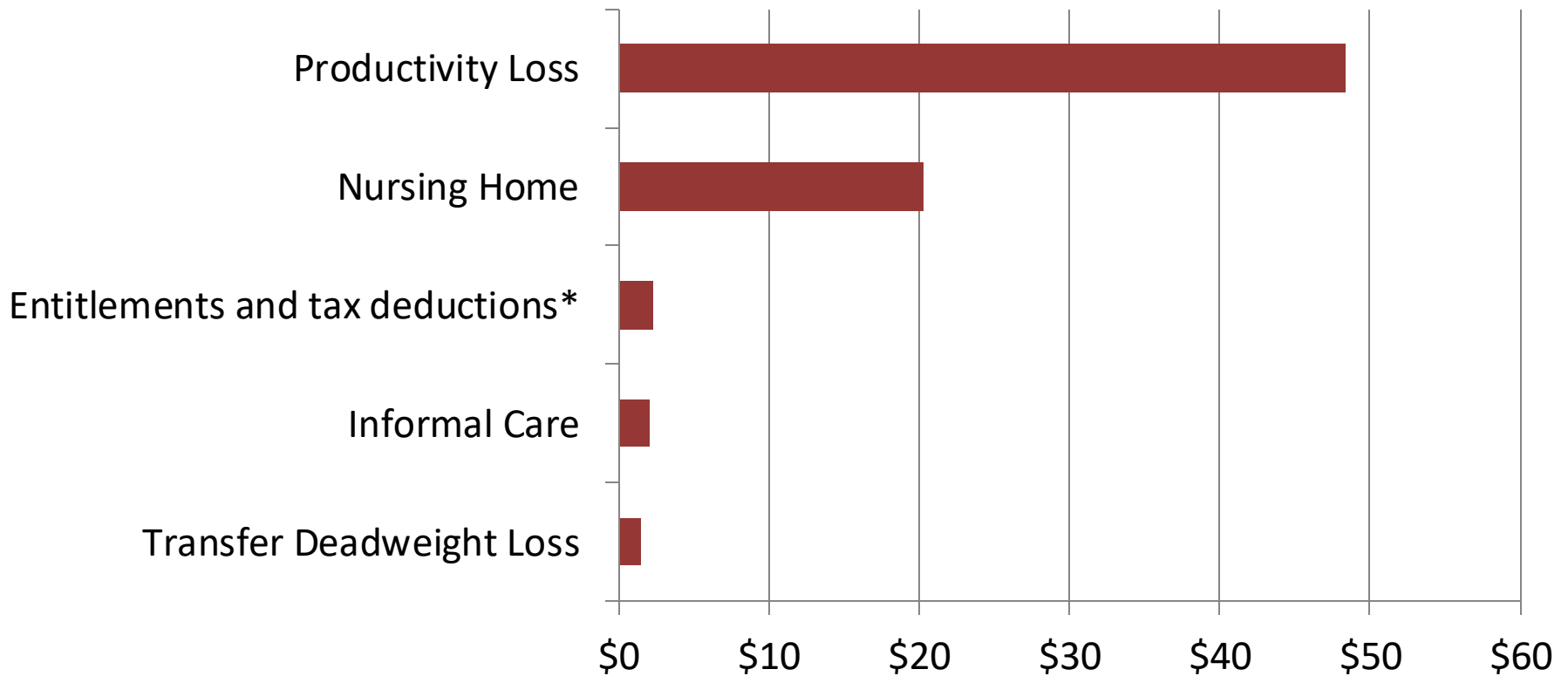
Direct and indirect costs by age group, \$bns



Direct costs by cost category, \$bns

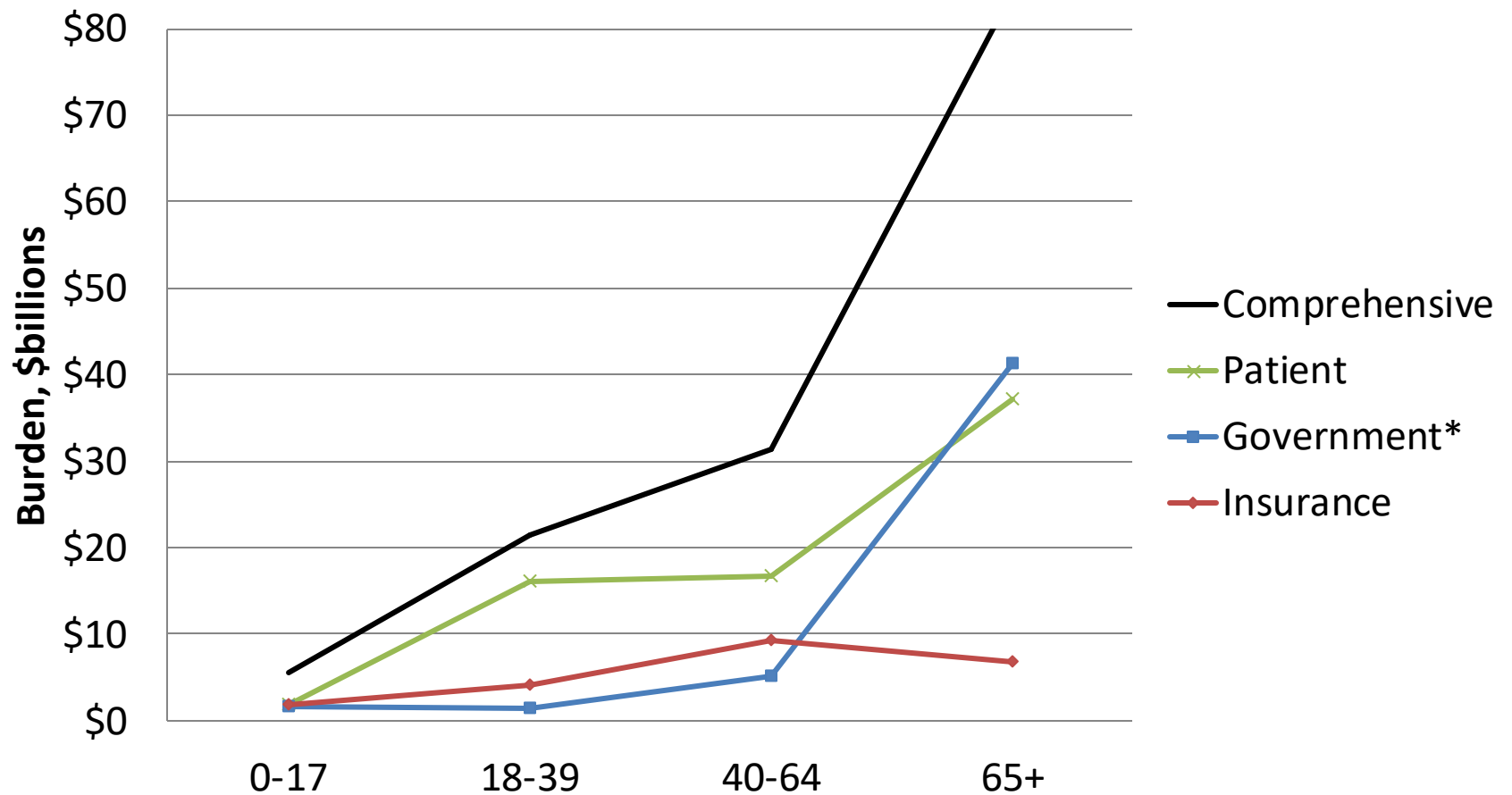


Indirect costs by cost category, \$bns

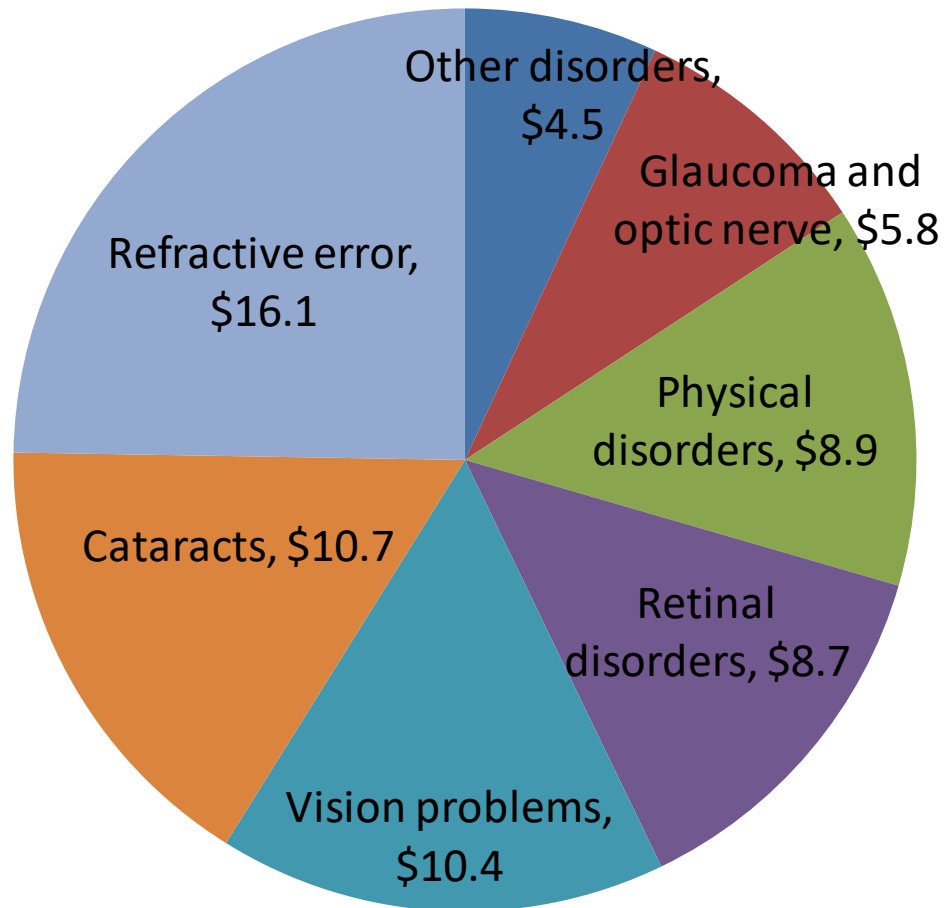


*Not included in comprehensive costs

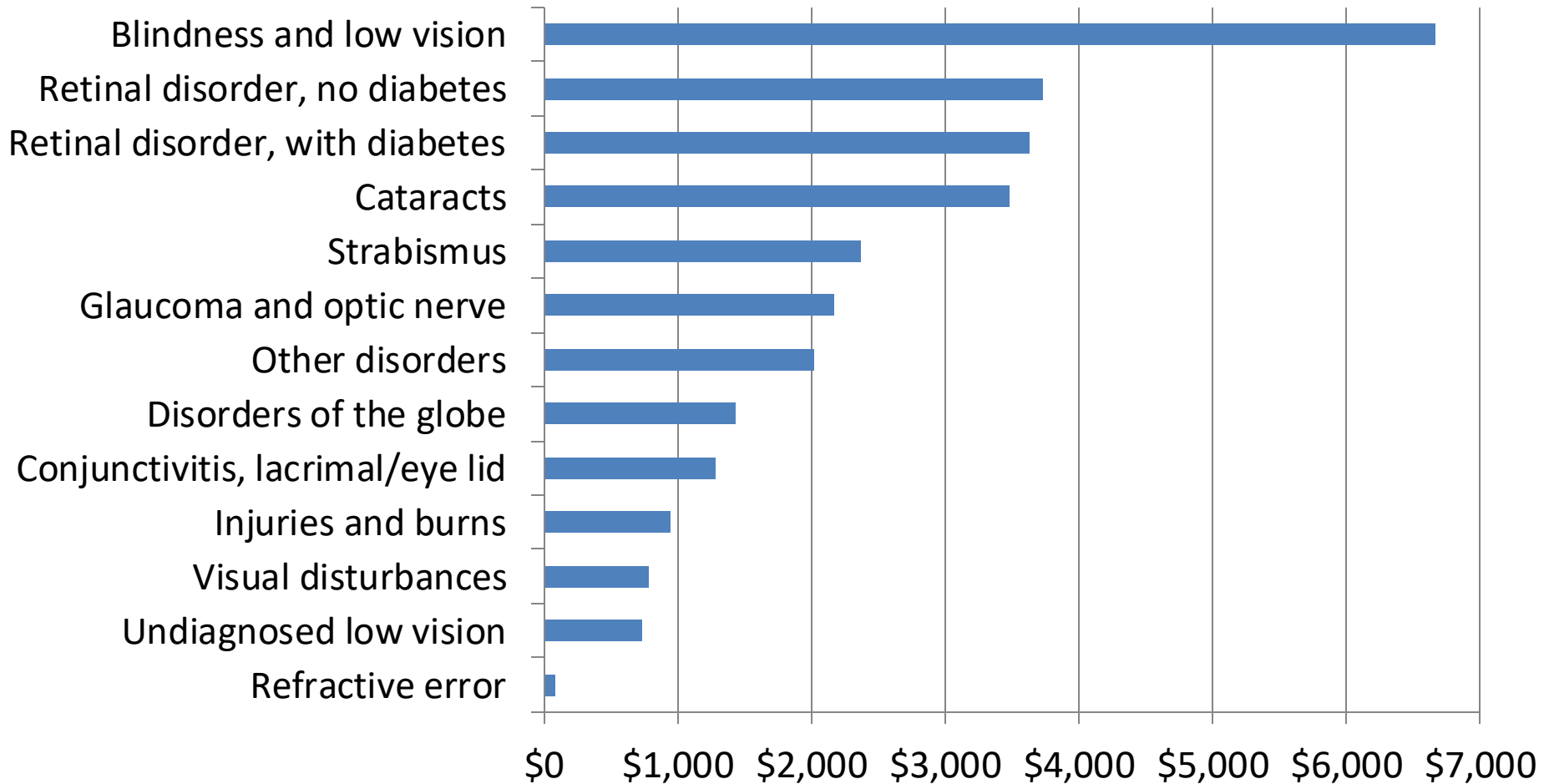
Costs by payer by age group



Medical costs by disorder group, \$bns

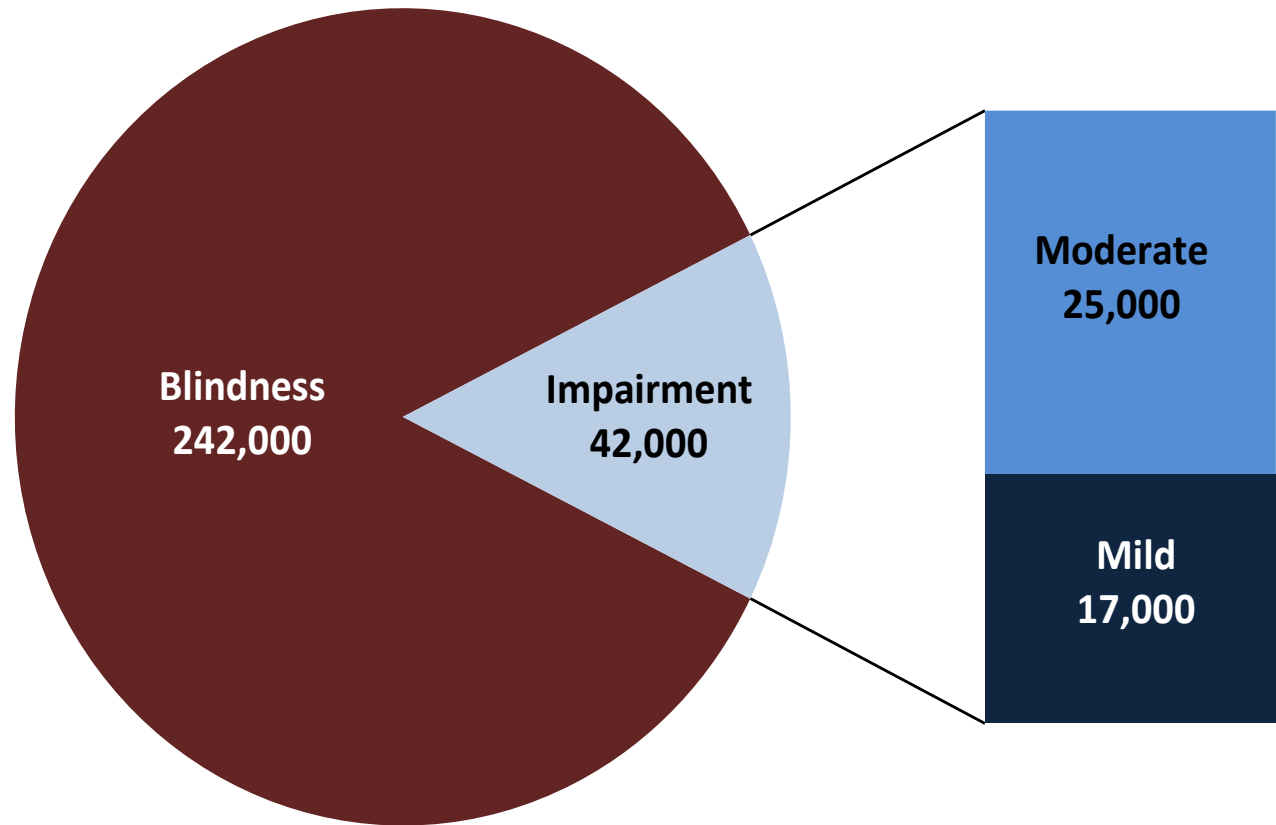


Per-person annual medical costs by disorder



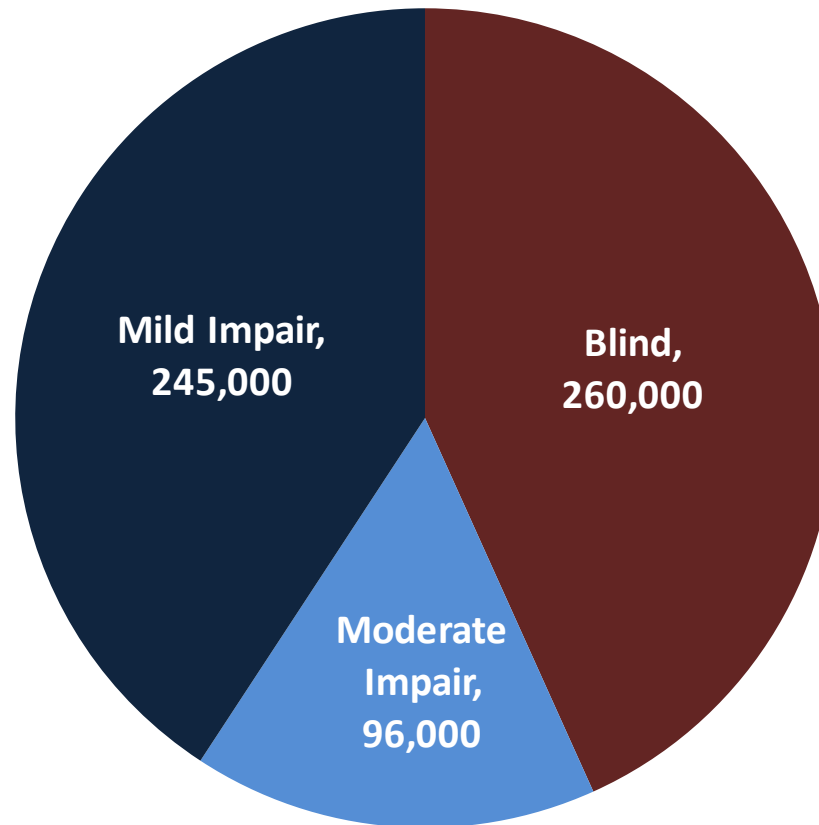
Loss of well-being: Disability adjusted life year losses

- 283,000 DALYs lost

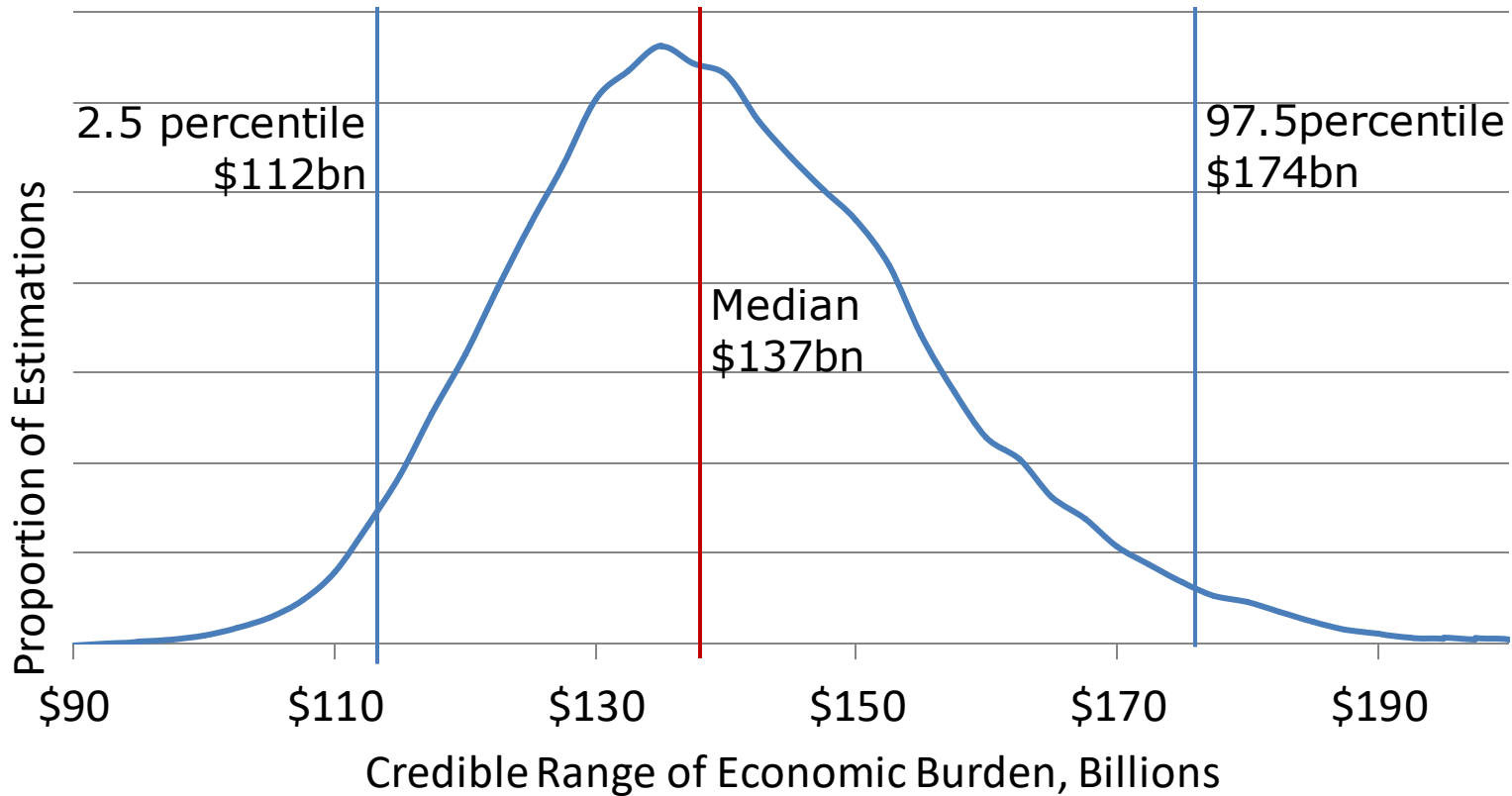


Loss of well-being: Quality adjusted life year losses

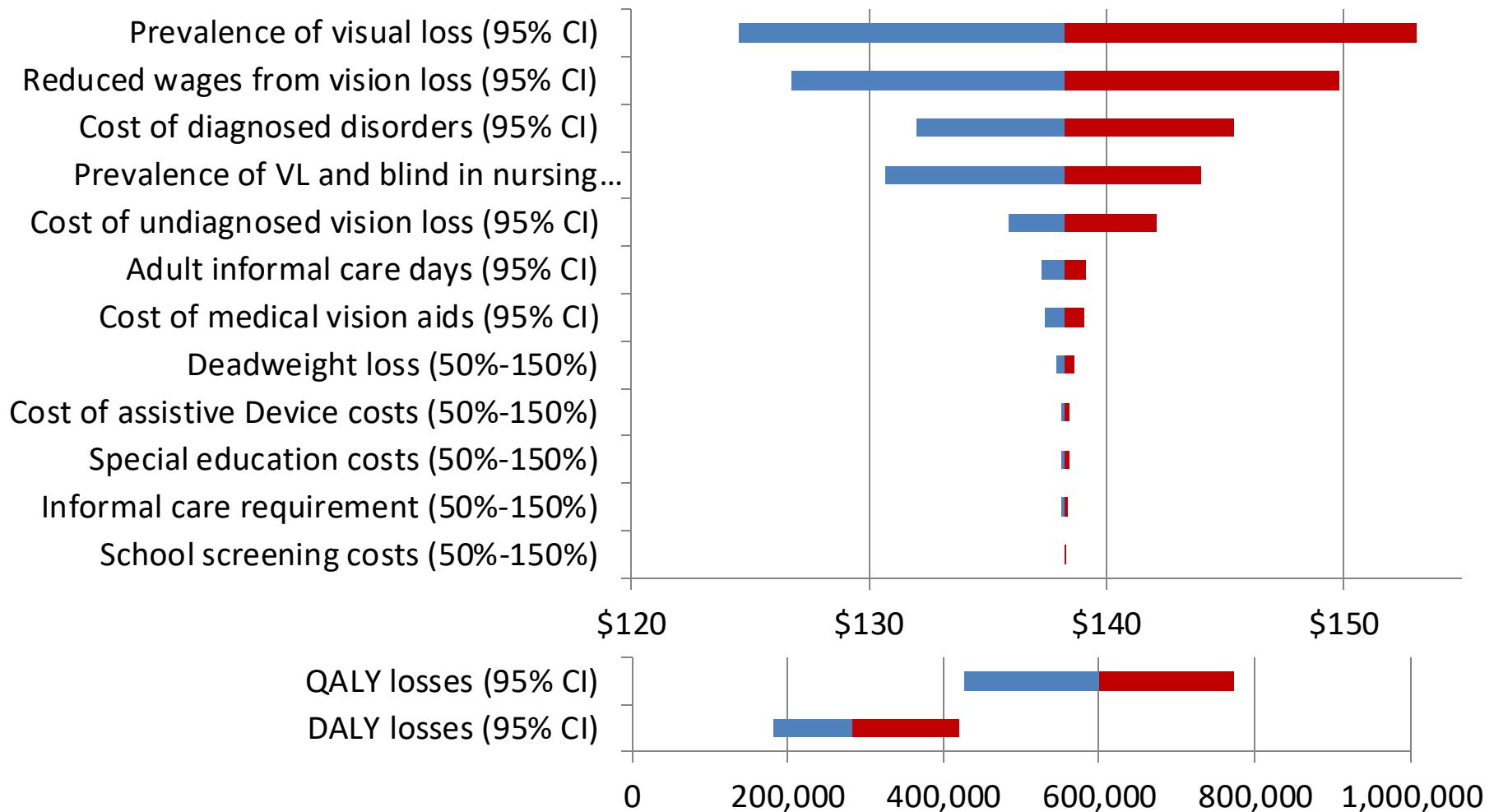
- 601,000 QALYs lost



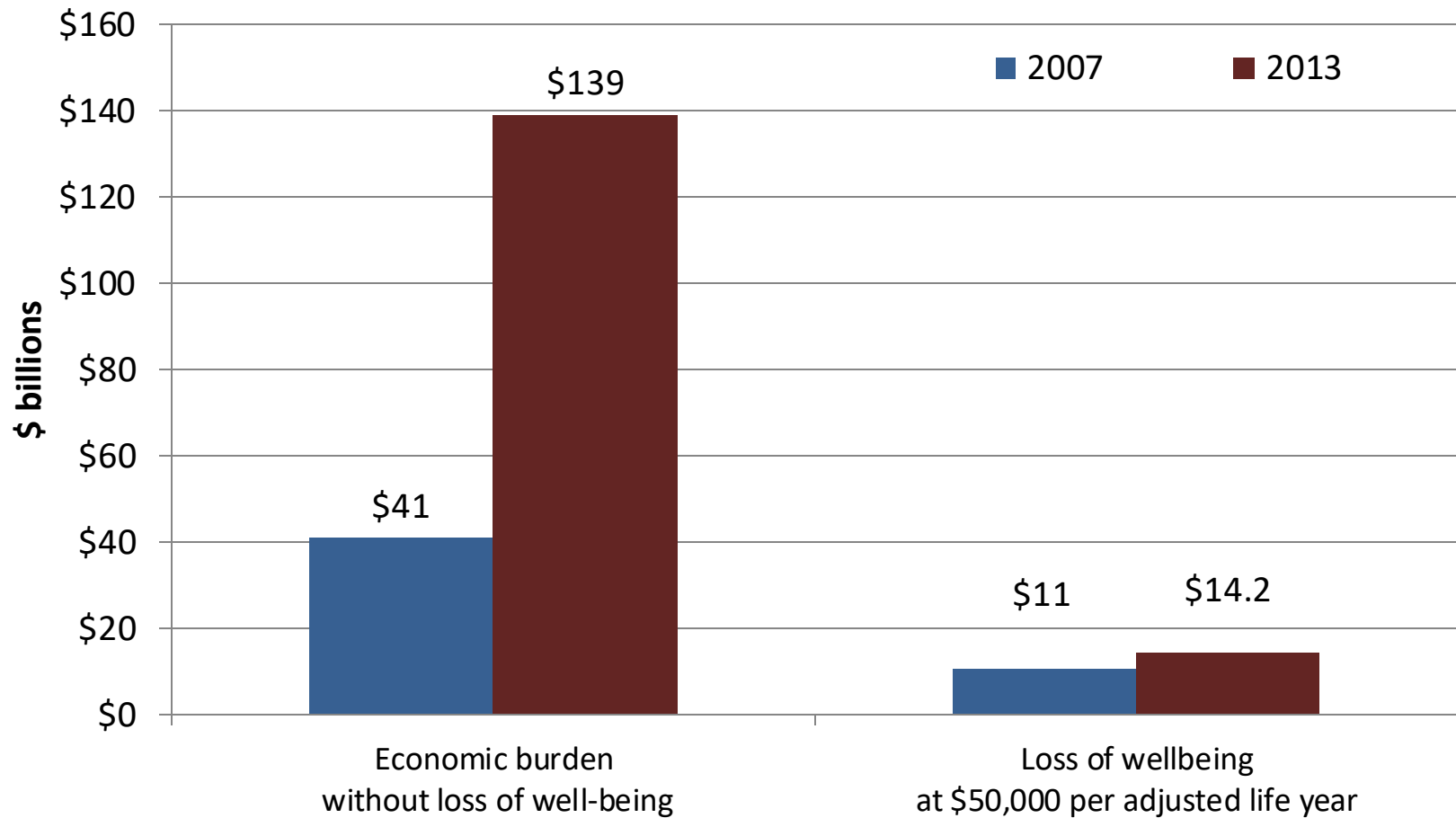
95% Credible interval of burden estimates



Impact of parameter uncertainty



Comparing to 2007 burden estimate



Comparing to 2007 burden estimate

- Why do costs apparently increase so much?
 - Broader analysis
 - Includes younger than age 40
 - More eye conditions
 - More cost categories
 - More costs reflected in MEPS than claims
 - Out-of-pocket and vision insurance payments
 - Medicare prescription drugs
 - Optometry visit costs
 - Methodology differences
 - “Top down” econometric approach captures costs of non-eye care procedures (i.e., injuries, depression, lower physical activity, higher treatment costs)

Comparing to 2007 burden estimate, \$bn

Cost Category	2007 Estimate	2013 Estimate
Age 40+ Medical Costs	2013 \$	
AMD, glaucoma, cataracts, diabetic retinopathy	\$10.7 \$14.4	\$24.6
Vision aids	\$5.5 \$7.4	\$8.4
Low vision	\$5.1 \$6.9	\$2.5 ^a
Other optometry visit costs	na	\$1.8
Additional adult disorders	na	\$14.4
Age 0-39 Medical Cost	na	\$13.2
Productivity Losses		
Ages 40-64 only	\$8.0 \$9.8	\$10.8
Other ages	na	\$37.6
Long-term and Informal Care		
Nursing home care	\$11.0 \$14.7	\$20.2
Informal care	\$0.4 \$0.4	\$2.1
Dog guides and Government Assistance	\$0.16 \$0.2	\$0.3
Other Direct and Indirect Costs	na	\$5.19 ^b
Monetized Quality of life	\$10.5	na
Total	\$51.4 \$53.9	\$139.0 \$69.0

^a Controlling for diagnosed disorders in 2013

^b Includes \$2.2n in transfer payments not in Total

Limitations

- Major assumptions
 - Mixing vision loss prevalence data
 - Self-reported vision loss for productivity loss
- Uncertainty in important parameters
 - Prevalence of vision loss
 - Impact of vision loss on wages and employment
 - Self-reported eye disorder prevalence
 - Nursing home placement due to vision loss
- Excluded costs
 - Monetized well-being, mortality, primary care screening

Conclusions

- The estimated burden more than doubled from the 2007 estimate
 - Primarily due to broader perspective and more current and comprehensive cost data
- Vision loss and eye disorders are among the costliest health conditions in the United States
 - High direct and indirect costs
 - Likely to continue to increase due to an aging population and growth in medical costs



Thank You!



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The findings and conclusions in this paper are those of the author and do not necessarily represent the official position of NORC at the University of Chicago, Prevent Blindness America, or the Centers for Disease Control and Prevention.

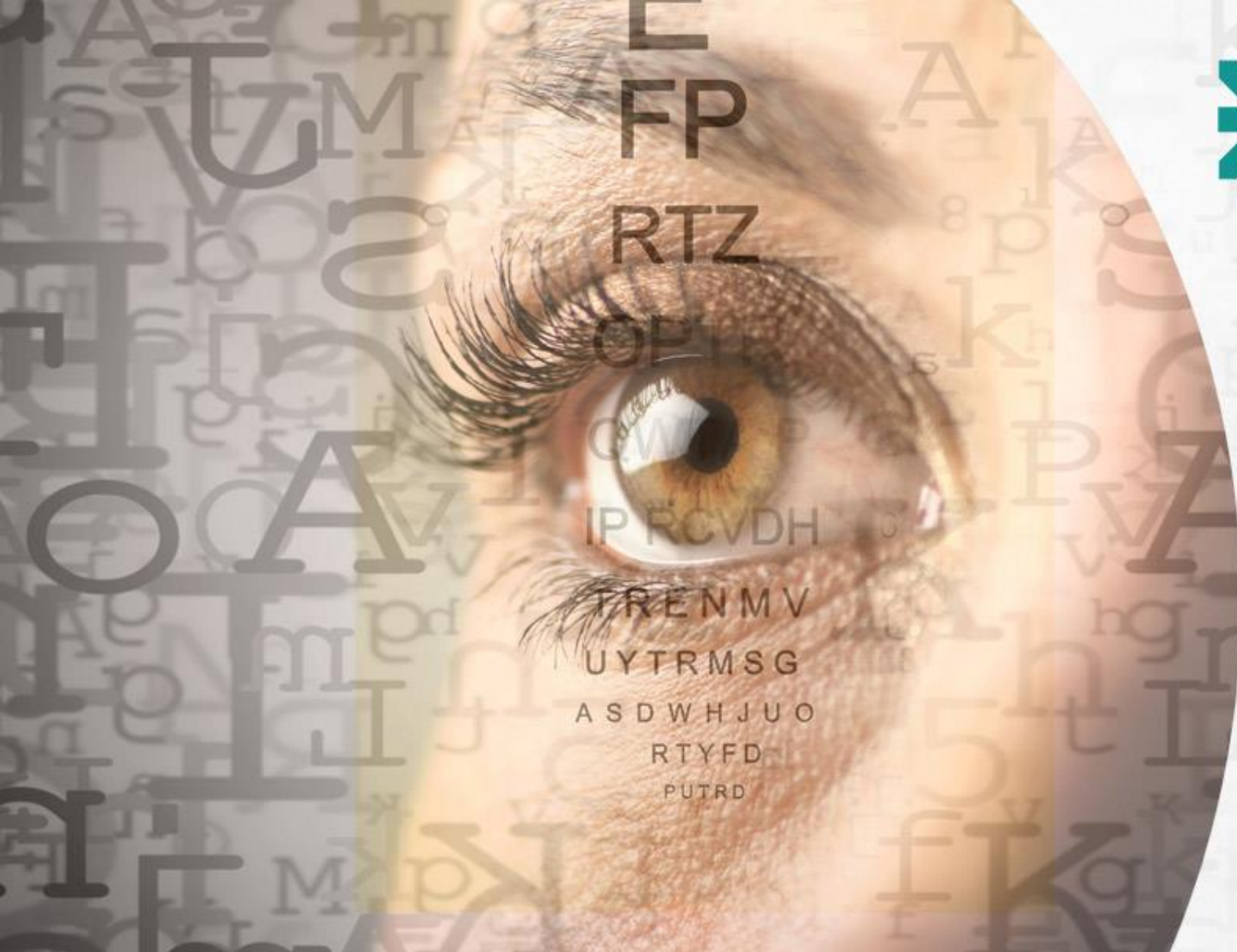
For more information:

John Wittenborn

1-312-519-5718

Wittenborn-John@norc.org

JohnSWittenborn@gmail.com



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