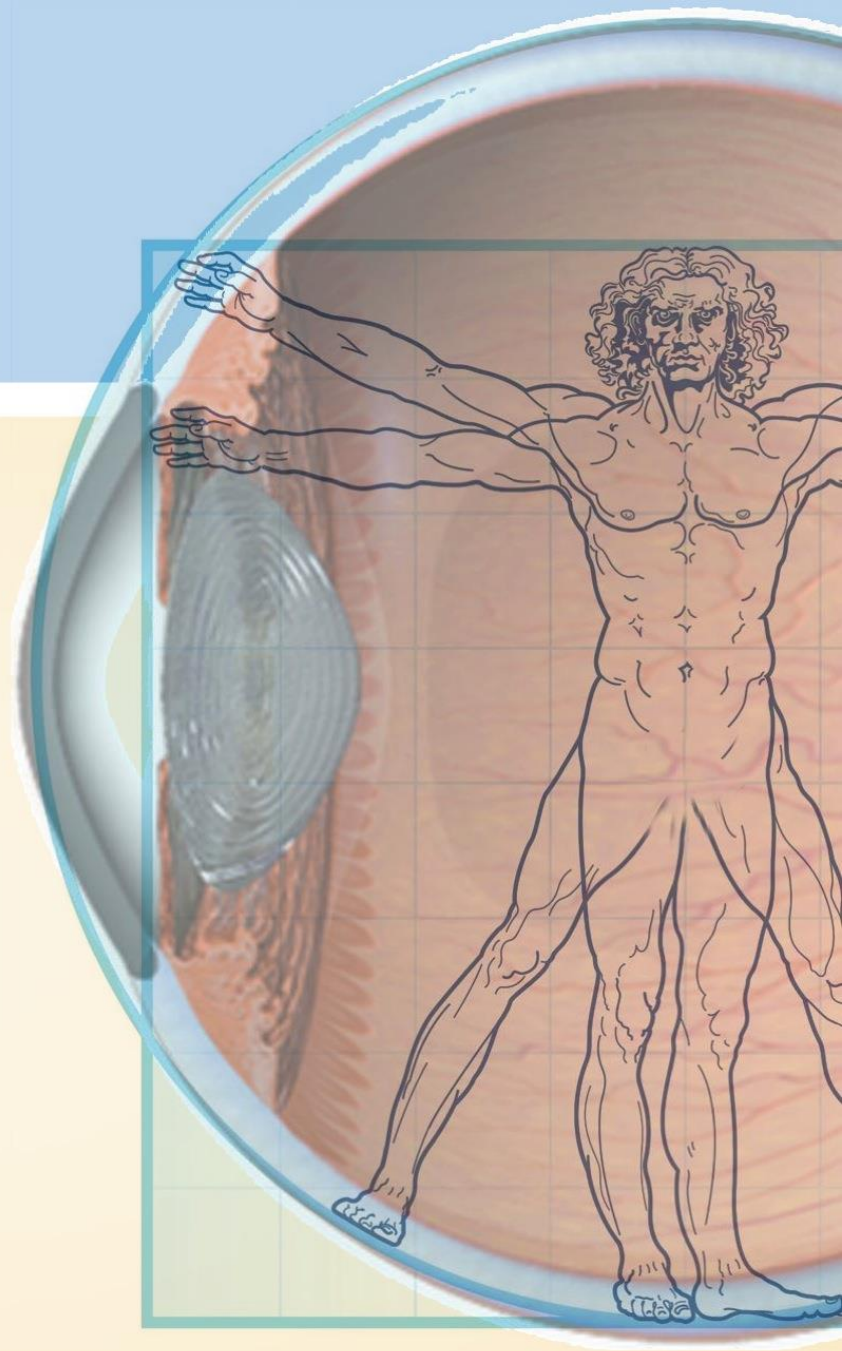




Our Vision Is Vision®

Third Annual
FOCUS ON EYE HEALTH
National Summit

Wednesday
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THE FUTURE OF VISION

Forecasting the Prevalence and
Costs of Vision Problems

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NORC

at the UNIVERSITY *of* CHICAGO



*“What can we do to help
reduce the toll of vision
problems?”*

Answering this question is why we are here



- 1. “What is the current landscape of vision problems?”*
- 2. “What are the costs of these vision problems?”*
- 3. “What will happen in the future if nothing is done?”*



1. “What is the current landscape of vision problems?”

Vision Problems in the U.S.

Prevalence of Adult Vision Impairment and Age-Related Eye Disease in America

- Released at 2012 Summit
- Estimated the prevalence and prevalent population of adults with eye disorders in 2010
- Searchable website makes this data more accessible than ever before



Vision Problems in the U.S.

Prevalence of Adult Vision Impairment and Age-Related Eye Disease in America

[Search the Vision Problems Database](#)





2. “What are the costs of these vision problems?”



- Estimated the total cost of vision problems
- Included costs for all ages
- Costs category, disease and payer
- Detailed report and interactive website

THE COST OF VISION PROBLEMS

the impact of chronic health problems is hard to put into words.
so we put it into NUMB3RS...

\$139 billion

the total economic burden of eye disorders and vision loss in the United States *this year.*

\$6,680 per person, per year

the cost of treating blindness and low vision.

\$47.4 billion

the cost to the government and taxpayers, including direct medical costs and long-term care.

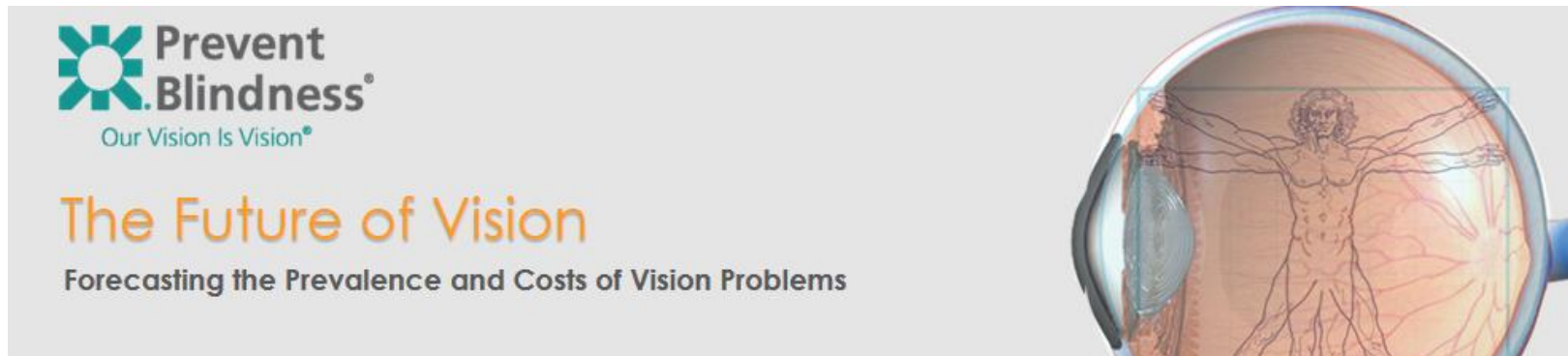
Vision loss and blindness come at a tremendous cost.
That's why Prevent Blindness America supports strong programs, policies and investments that protect vision and eye health.

 Prevent
Blindness
America™
Our Vision Is Vision™

View our full report on the cost of vision loss at costofvision.preventblindness.org



3. “What will happen in the future if nothing is done?”



- Combines what we know now...
 - From Vision Problems in the US:
“the current landscape of vision problems”
 - From the Cost of Vision:
“the cost and consequences of vision problems?”
- And forecasts what will happen from 2014 to 2050 based on current trends



“It's hard to make predictions, especially about the future”

-Yogi Berra*

- In forecasting, we are trying to predict the future by looking at the past
- These forecasts will not come true because things will change in the future
- The forecasts aren't about predicting the future, they are about understanding the impact of current trends



Projections



Projections do not show us where we be in the future, they show us where we are currently aimed





How to make projections

2 major ways to generate projections:

1. Prevalence Approach

- Use current per-person prevalence and costs
- Assign to future projected populations

2. Incidence Approach

- Use historical incidence of disease
- Simulate future incidence and outcomes in the current population



We Use a Prevalence Approach

Advantages:

- Better data, less required
- More straightforward, fewer mistakes
- No big assumptions needed, except...
- Assumes nothing changes

Disadvantages:

- Does not capture impacts of current or future changes
 - Are incidence or progression rates changing?
 - Impact of new treatments?
 - Changes in standards of care?



Methods – Prevalence-based Projections

- Calculate per-person prevalence and costs of conditions
- Convert age-group prevalence and costs to single-age values
 - Iterative regression approach
 - Ensures current estimates do not change
- Multiply per-person, single-age prevalence and costs by age, race and sex by annual 'US Census population projections'
- For costs, control for changes in utilization, intensity and inflation

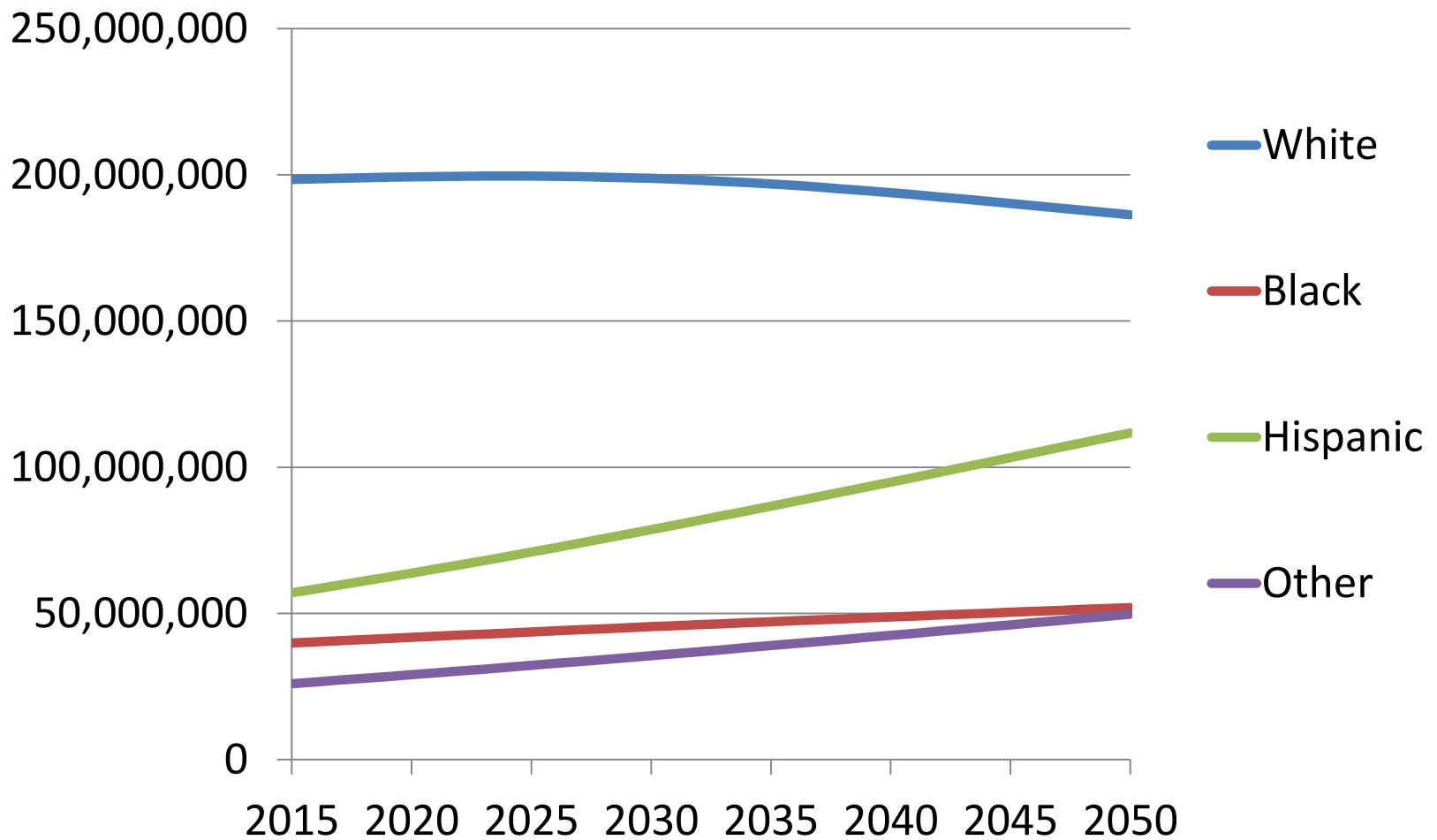


Other Limitations

- Uncertainty of data
 - Uncertainty in cost data
 - High and low population projections
 - No confidence intervals in Vision Problems in the US
 - Used % uncertainty from earlier prevalence papers
- Limitations of data
 - We cannot capture every cost
 - No disorder prevalence for ages <40-50
 - Prevalence grouped for ages 80+
 - May undercount elderly

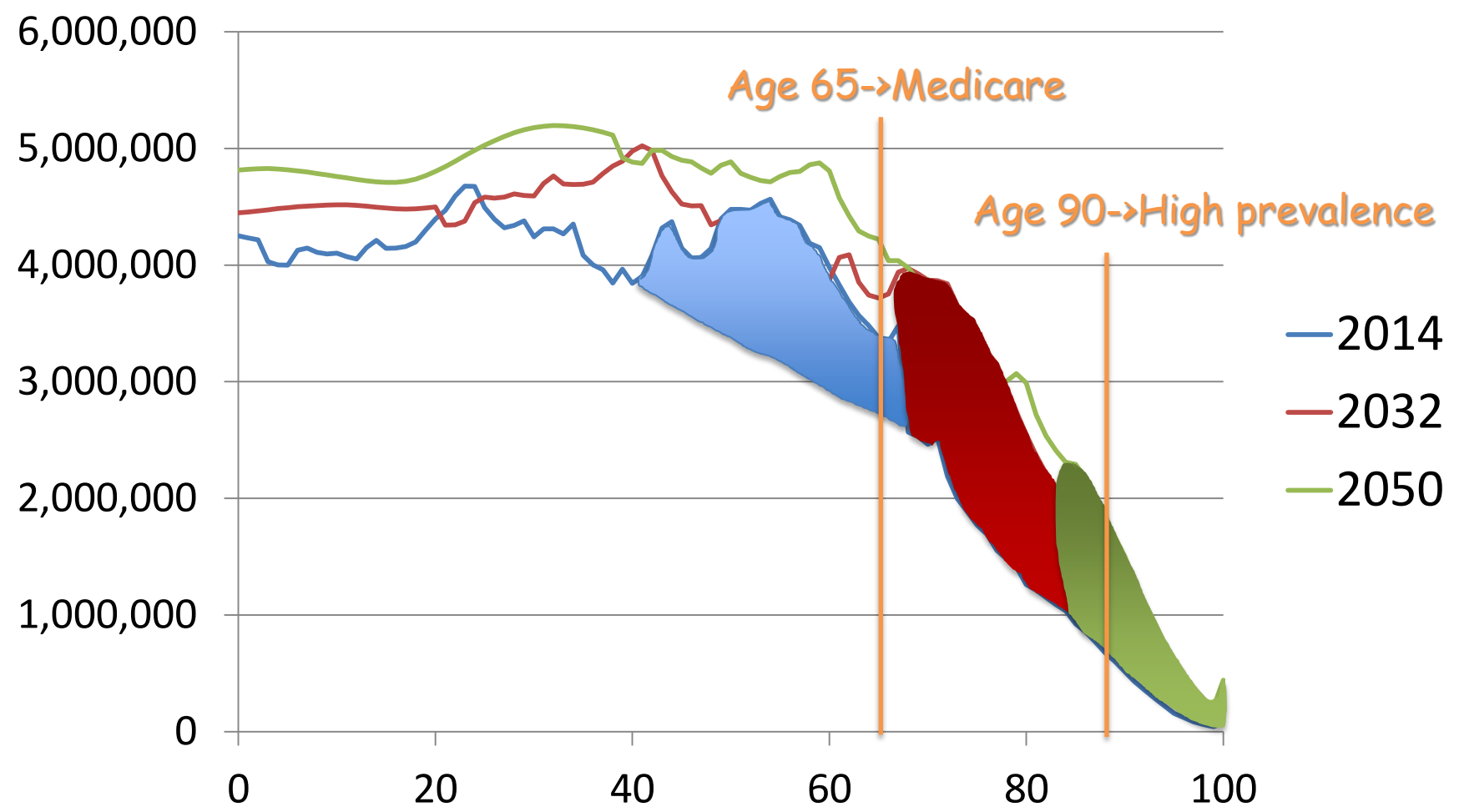


Population Projections – by race



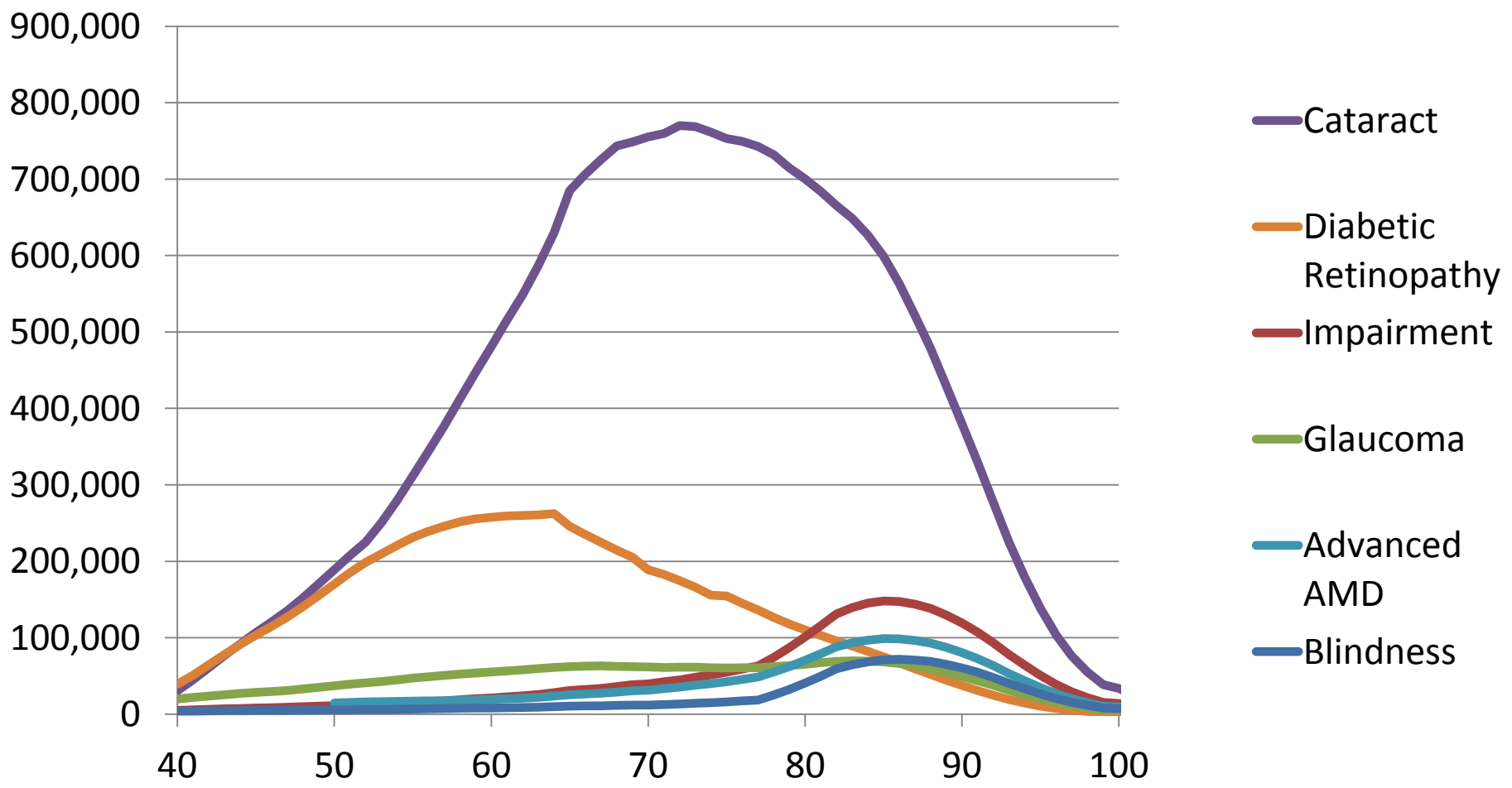


Population Projections – by age





Current Distribution of Disease Prevalence, by Age



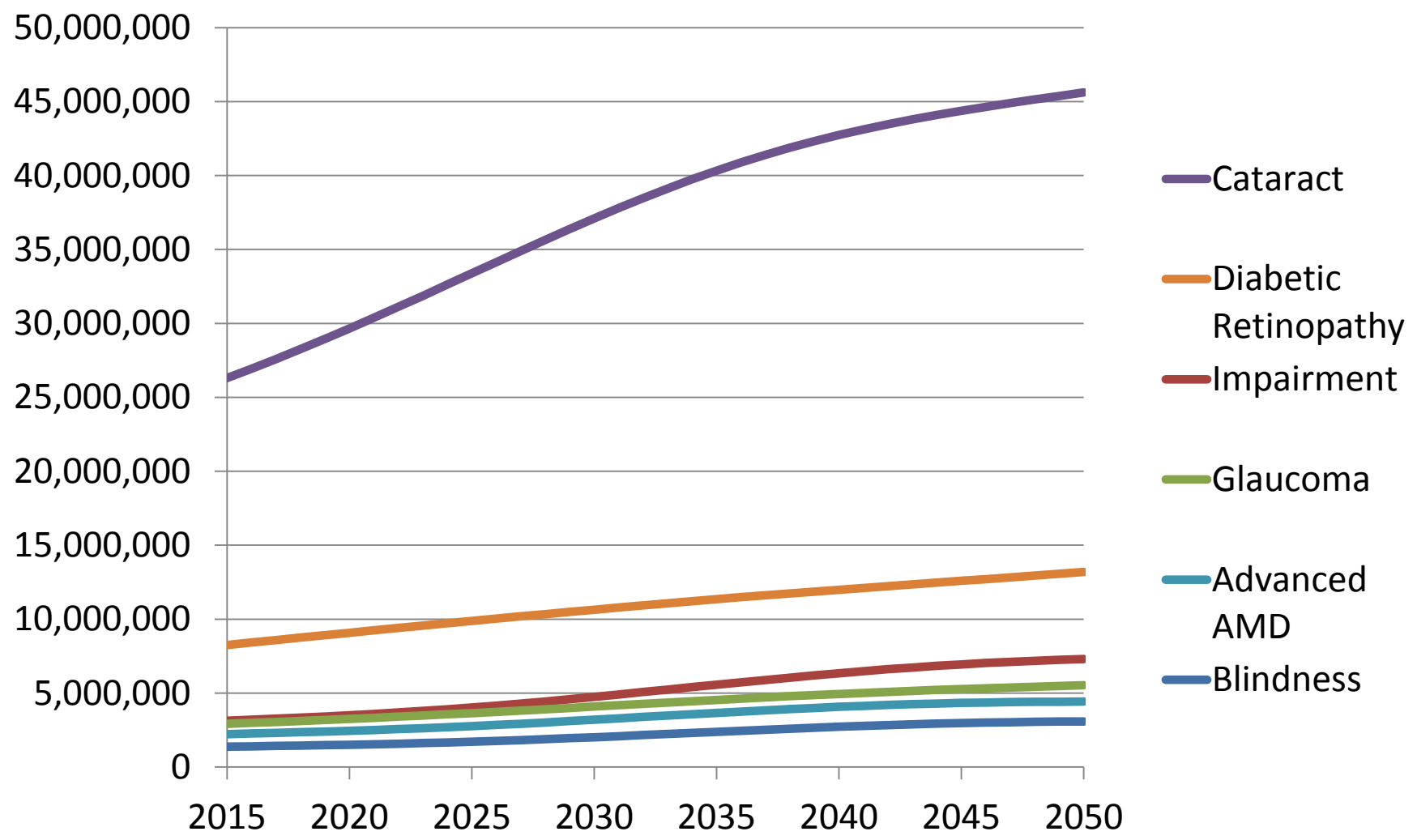


Disease Prevalence, Current Estimates & Projections

	Current Estimate	Projections		
	2010	2014	2032	2050
Cataract	24,409,978	25,666,427	38,477,608	45,620,606
Diabetic Retinopathy	7,685,237	8,084,767	10,938,504	13,190,538
Impaired	2,907,691	3,058,852	5,073,572	7,301,814
Glaucoma	2,719,379	2,858,572	4,275,758	5,526,347
Advanced AMD	2,069,403	2,176,985	3,387,560	4,425,989
Blind	1,288,275	1,355,248	2,161,164	3,088,249



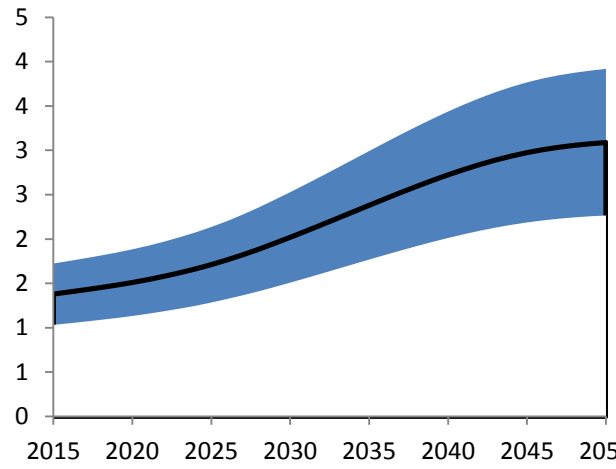
Disease Prevalence Projections, 2015-2050



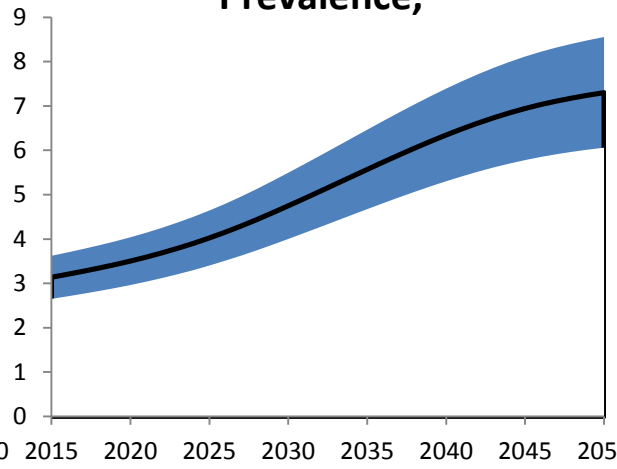


95% Confidence Intervals of Projected Prevalence, millions

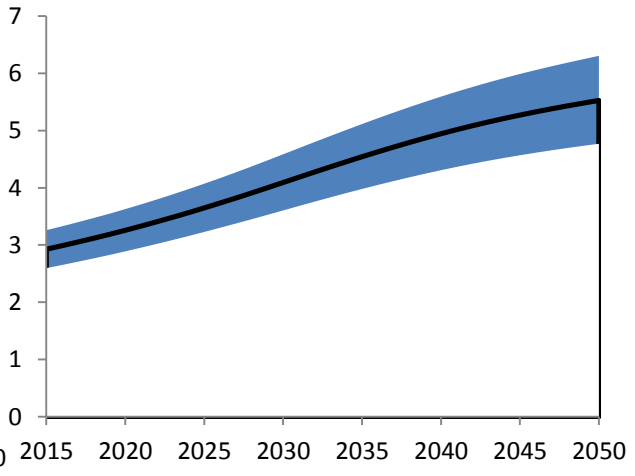
Blindness Prevalence



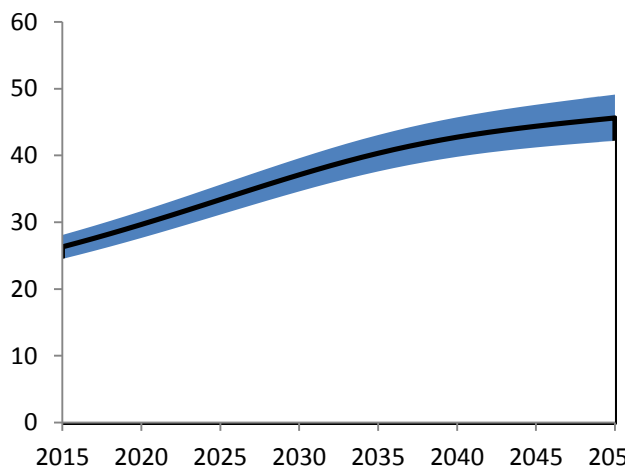
Vision Impairment Prevalence,



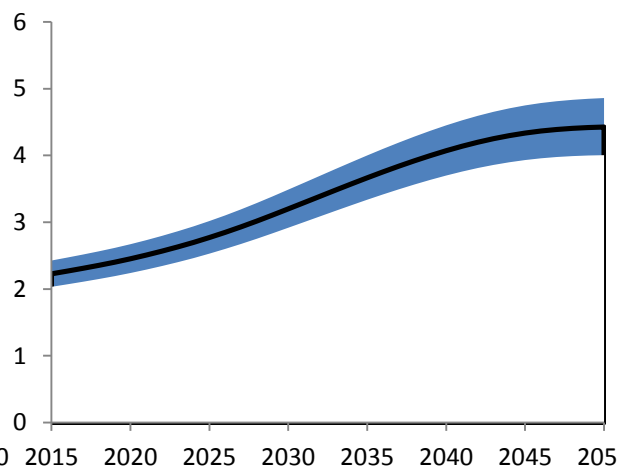
Glaucoma Prevalence



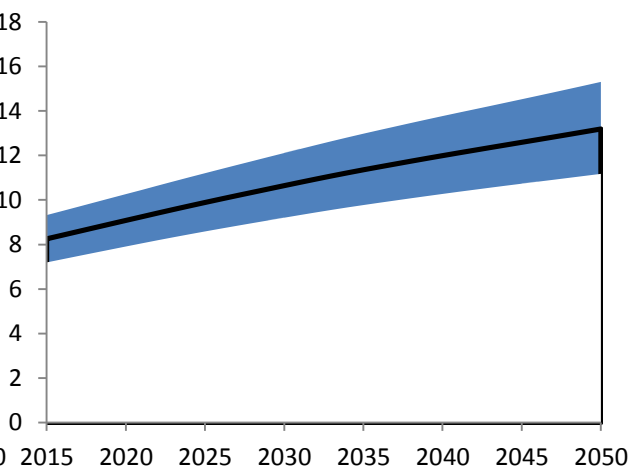
Cataract Prevalence



AMD Prevalence



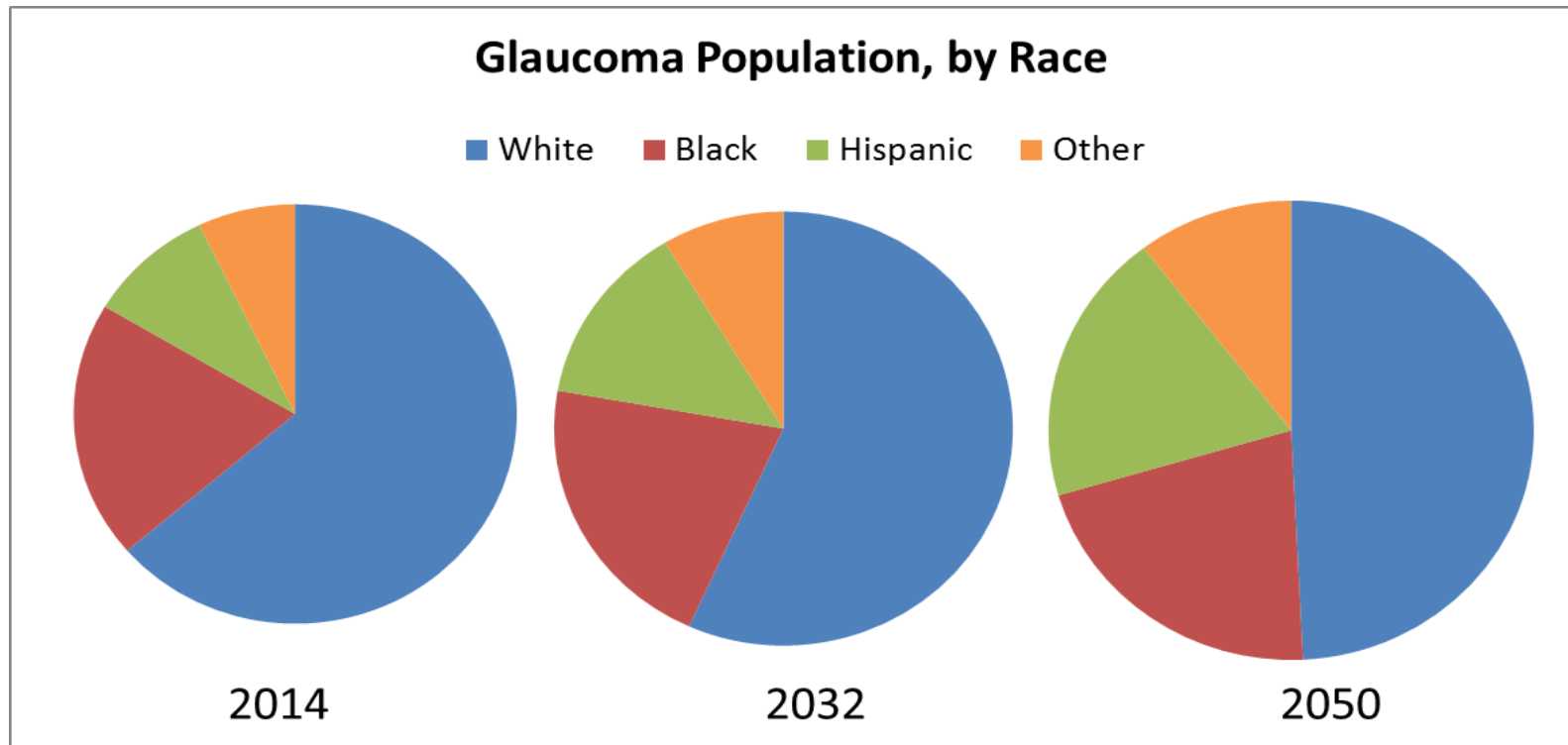
Diabetic Retinopathy





Glaucoma

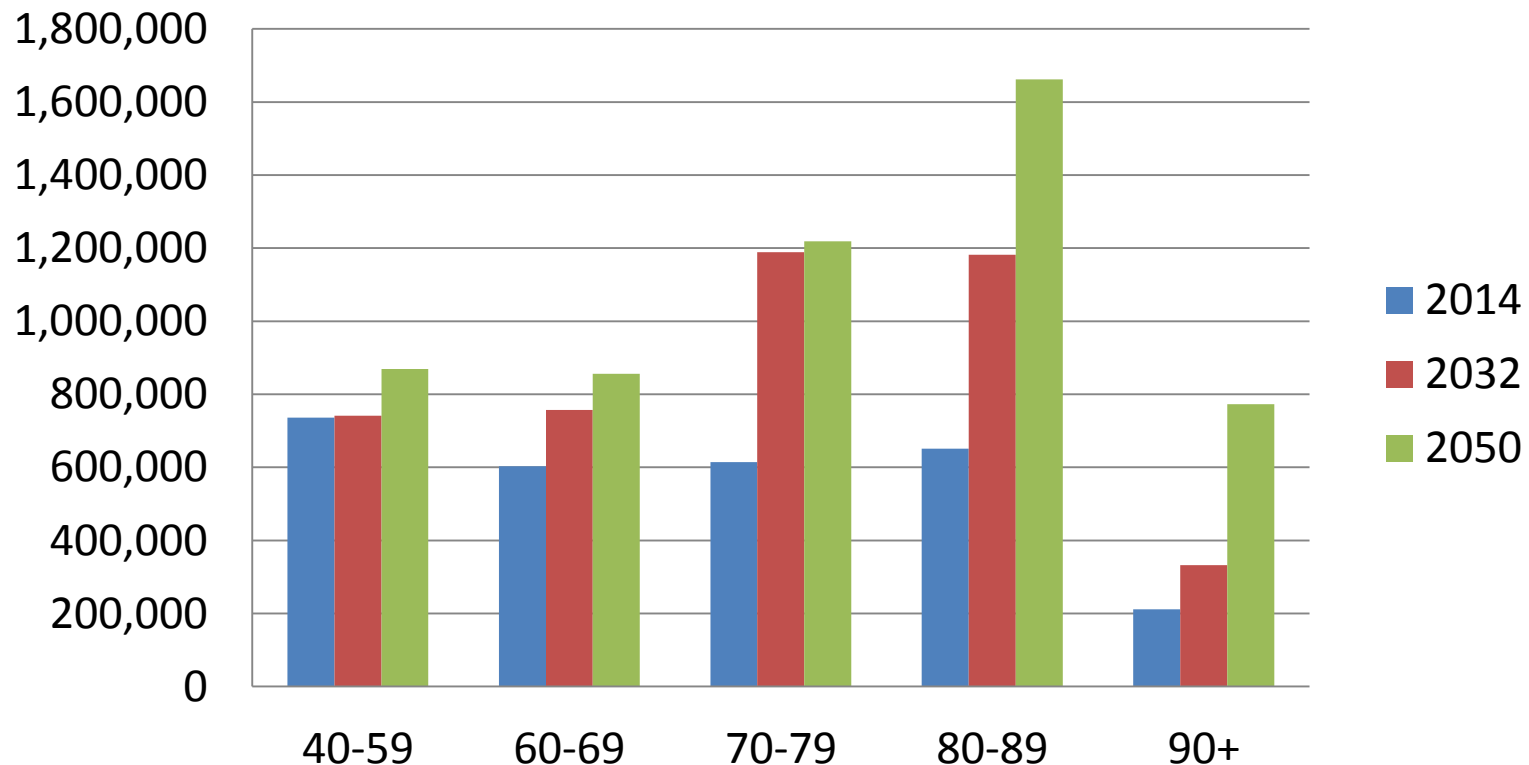
- By 2050, most glaucoma patients will be non-white





Glaucoma

- By 2032 - a big increase in ages 70-89
- By 2050 - increases in prevalence at ages 80-89, spiking prevalence at ages 90+



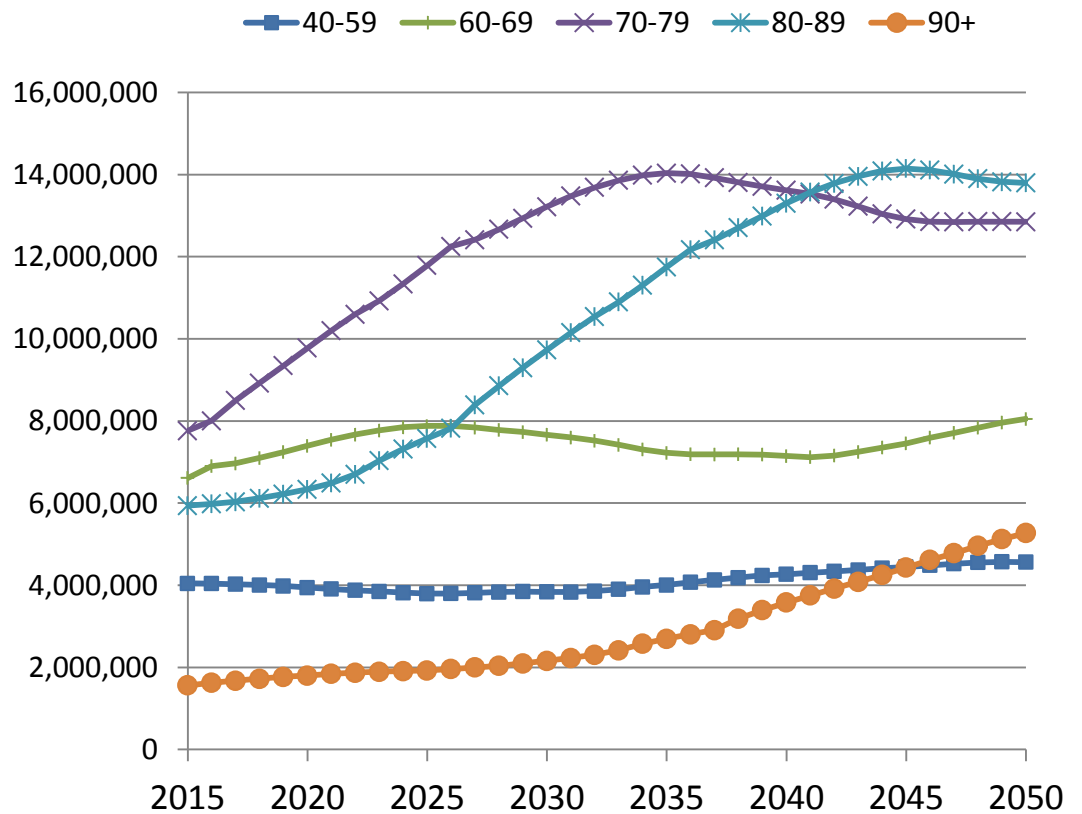


Cataract

- Cataract populations aged 40-69 will remain almost constant

- Spikes in prevalence

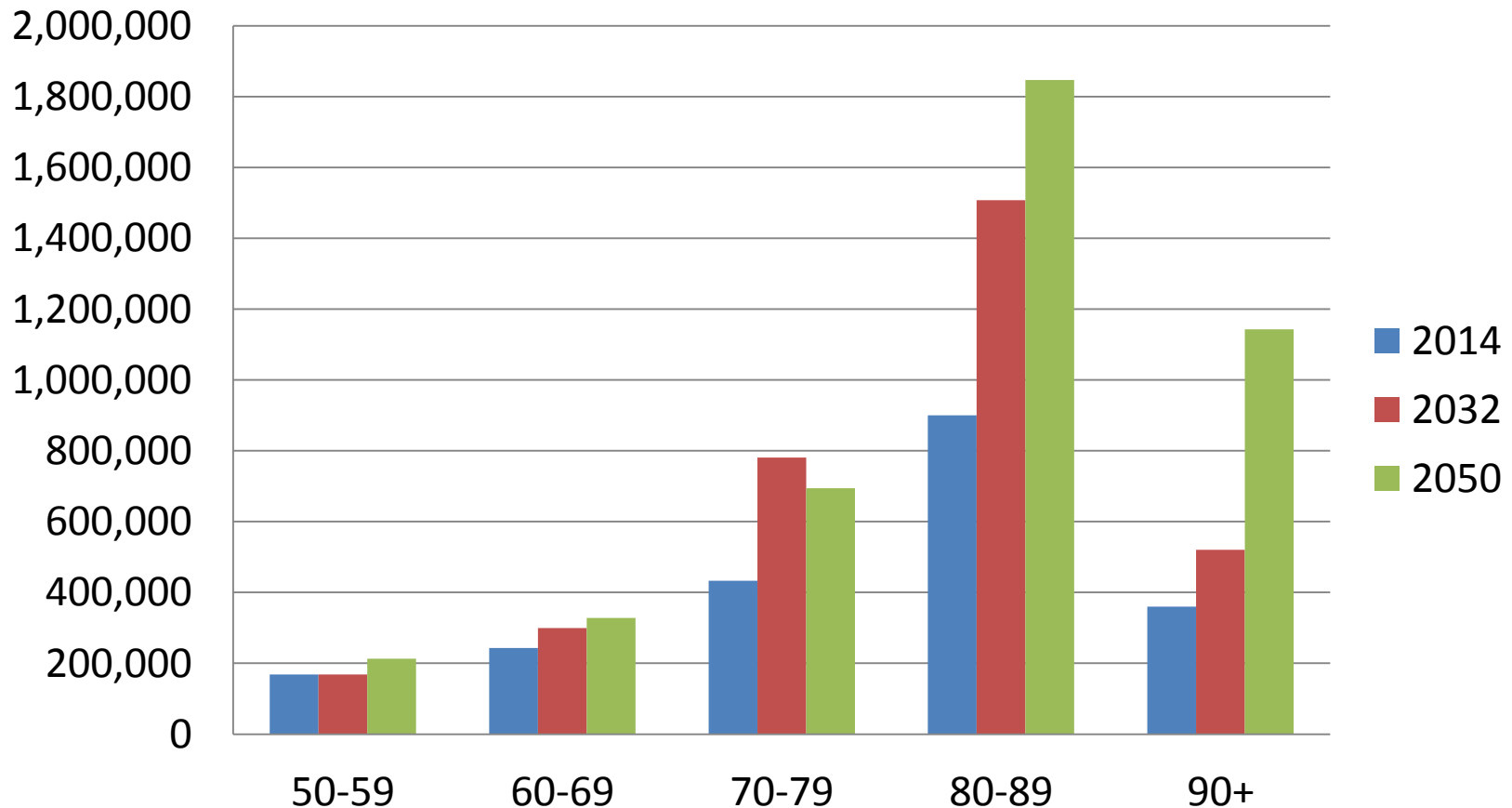
- 70-79 now,
- 80-89 in 10 years,
- 90+ in 20 years





Advanced Age-Related Macular Degeneration

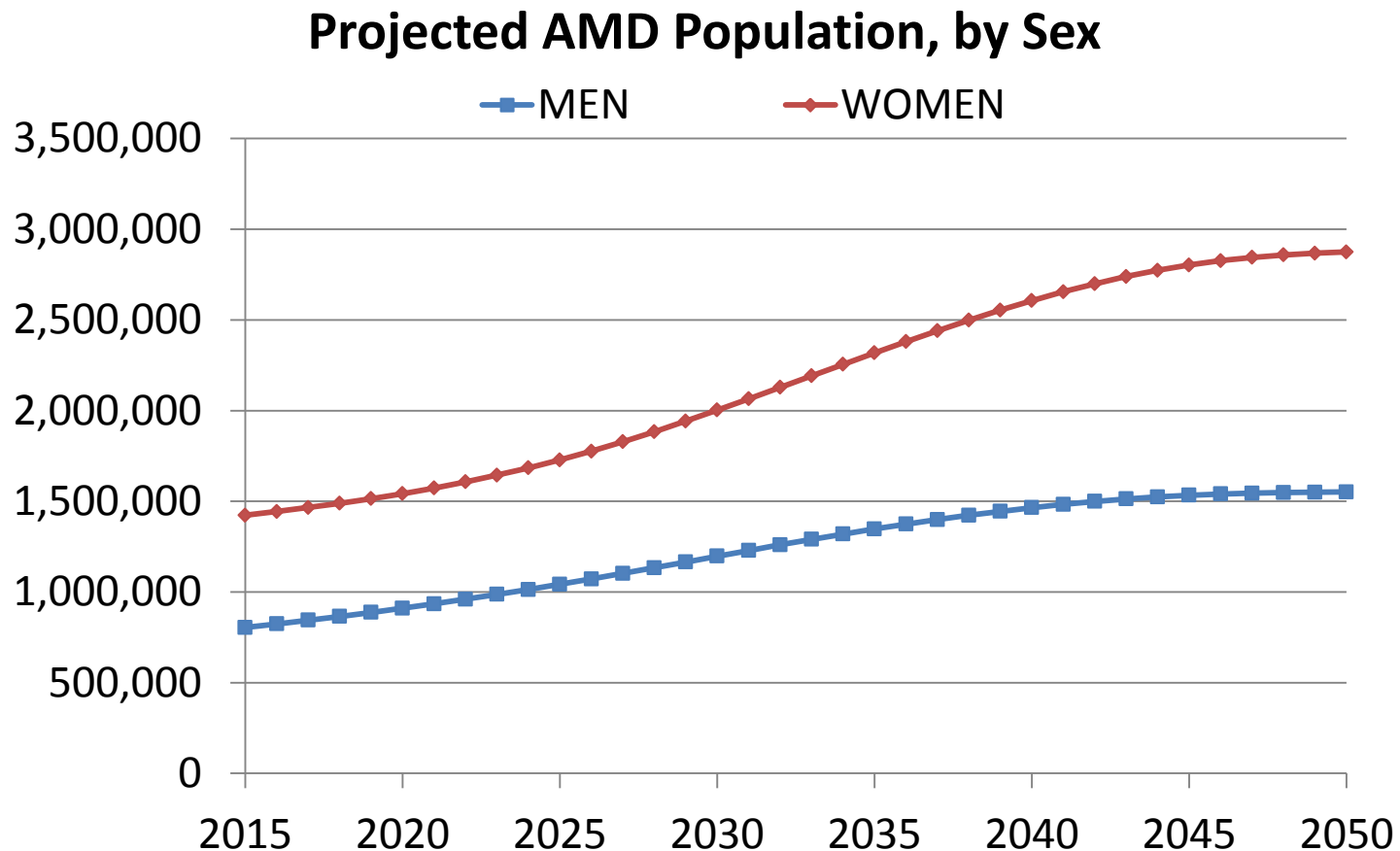
- Prevalence almost unchanged in younger groups
- Baby-boomer aging effect is pronounced in 2032 and 2050





Advanced Age-Related Macular Degeneration

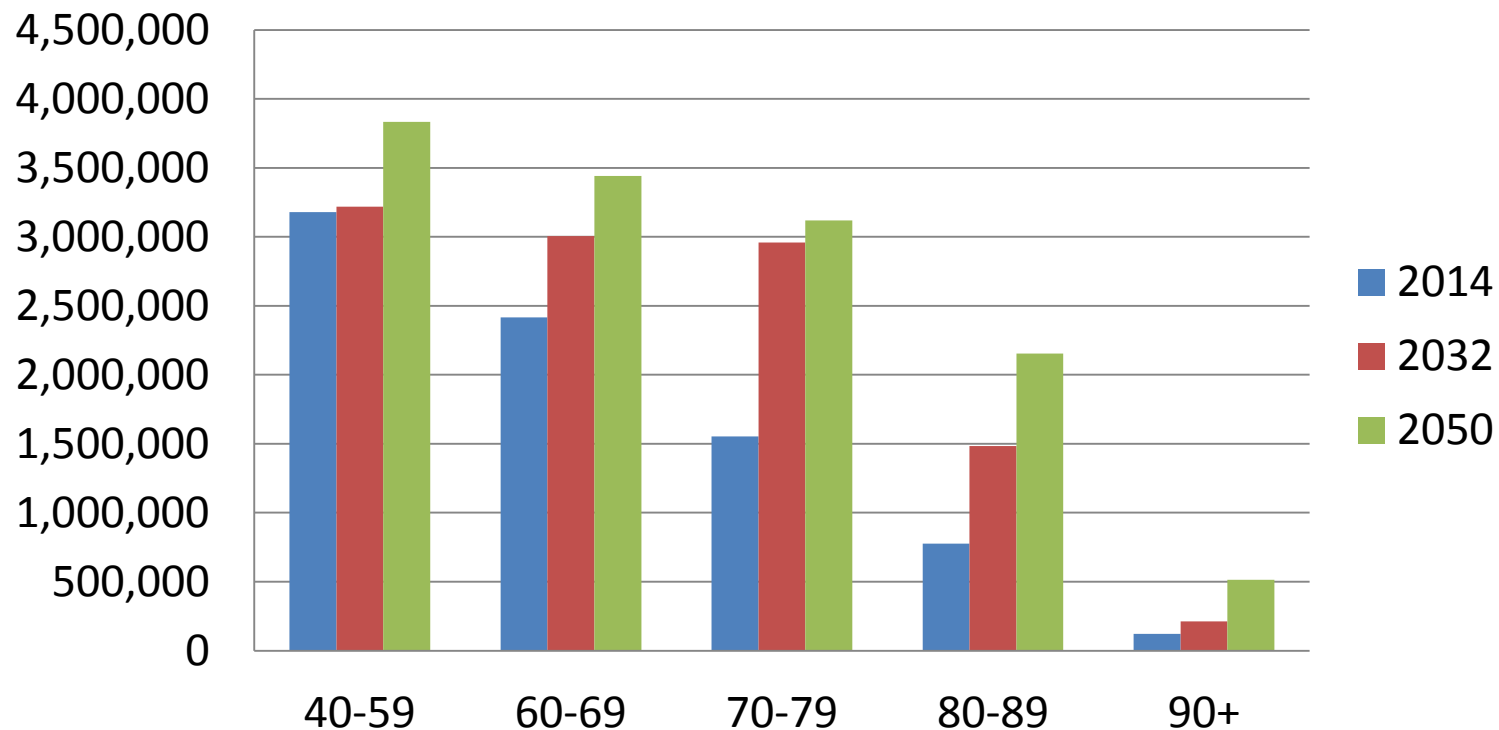
- Prevalence will skew even more heavily towards women





Diabetic Retinopathy

- The youngest prevalent population translates into the lowest projected growth of any disorder
- Projections may not capture effect of increasing diabetes prevalence

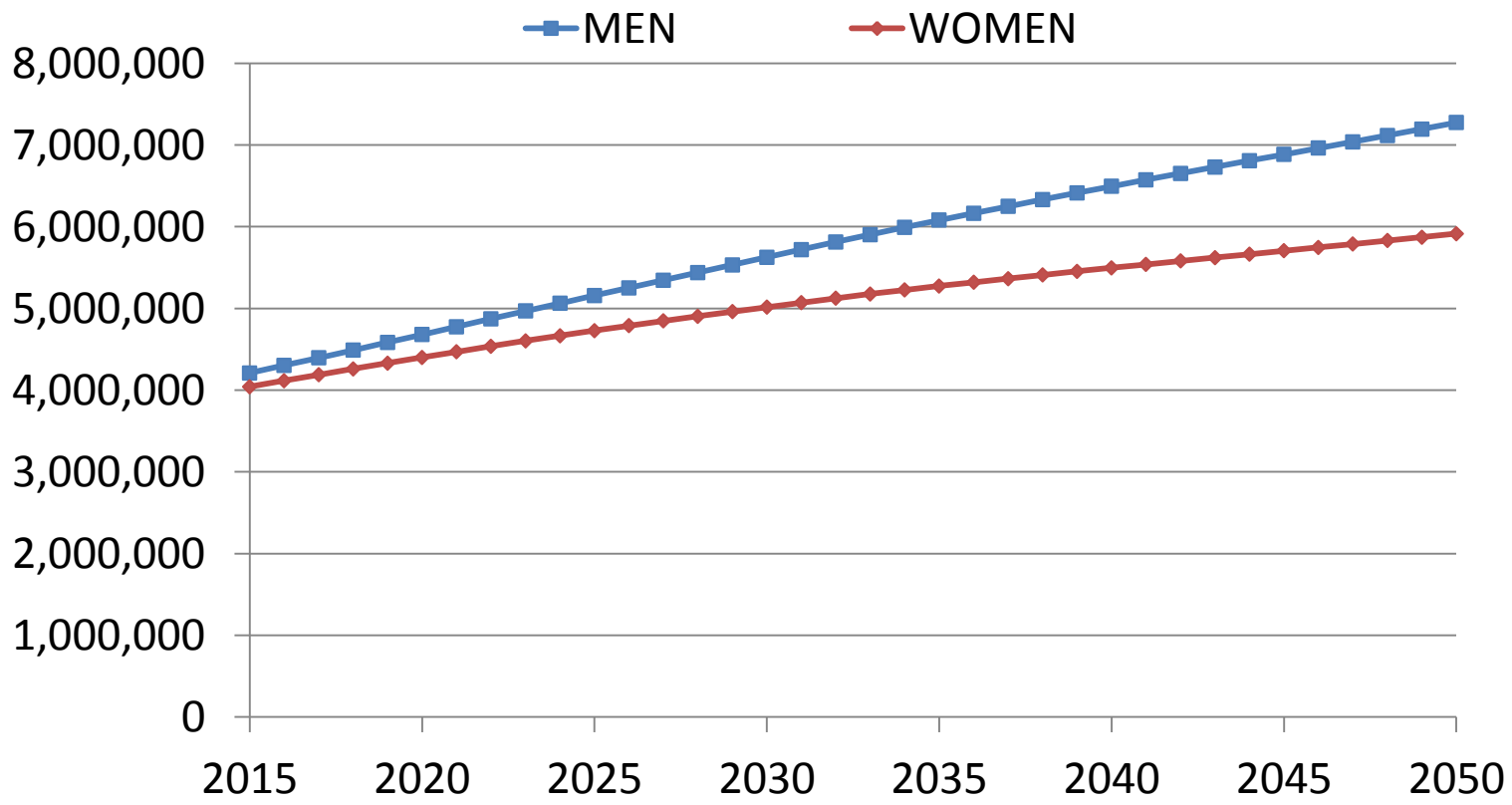




Diabetic Retinopathy

- The only condition more prevalent in men

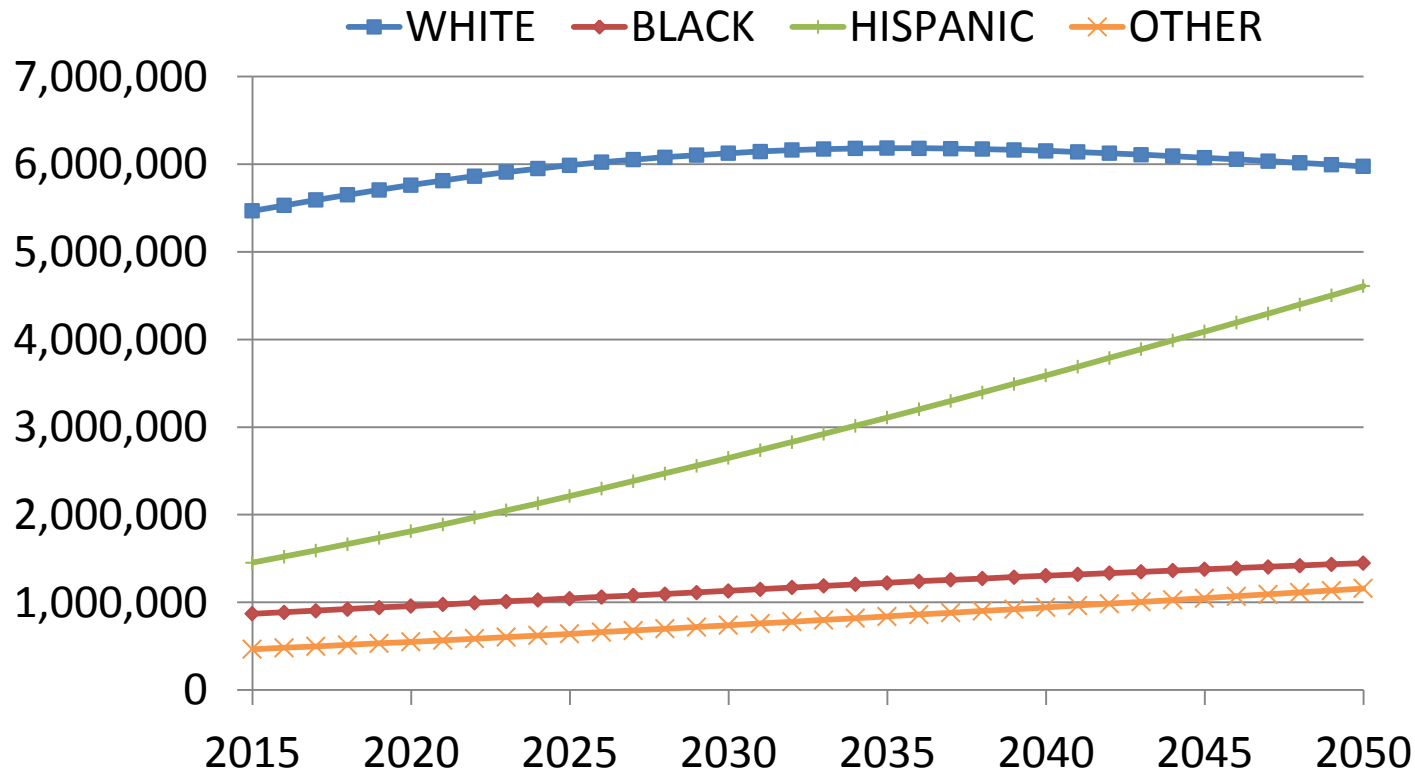
Projected DR Population, by Sex





Diabetic Retinopathy

- Very high prevalence among older Hispanics leads to extremely fast growth in Hispanic prevalence

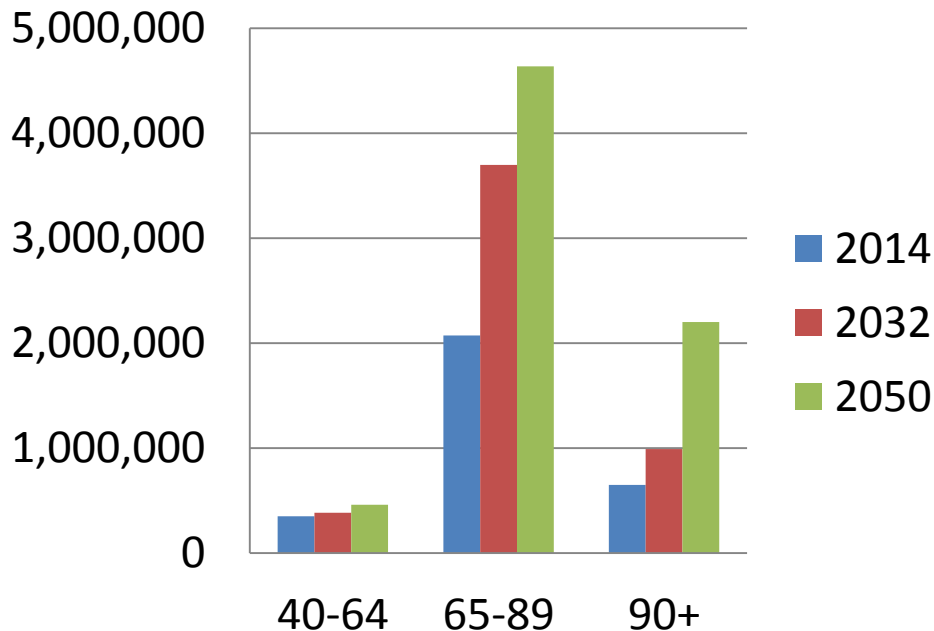




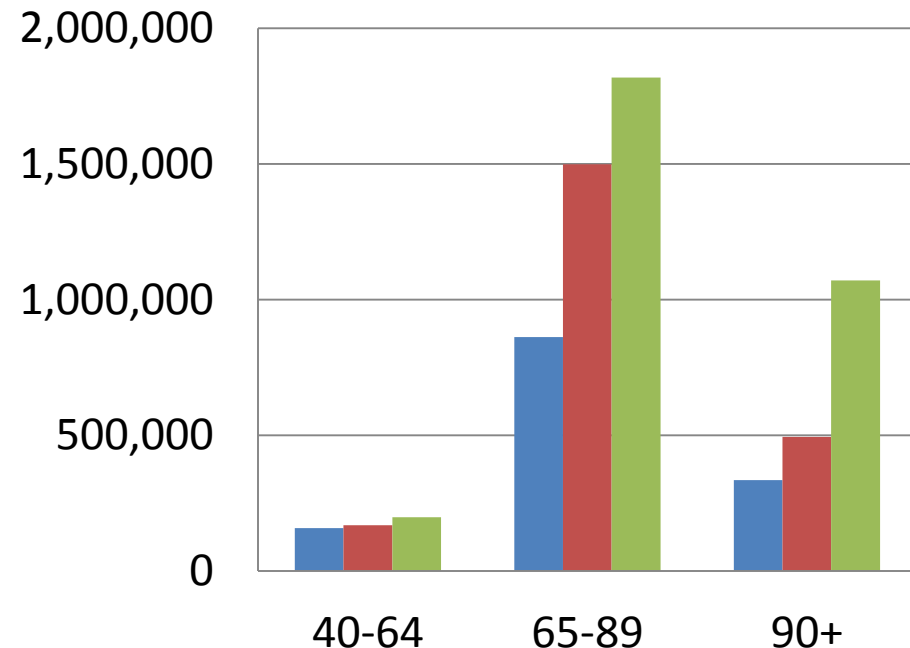
Vision Loss

- Even more skewed towards older ages than eye diseases

**Impaired Population, by Age Group in
2014, 2032, 2050**



**Blind Population, by Age Group in
2014, 2032, 2050**





Cost Projections

- Real (2014) costs
 - Adjusted to account for projected increases in
 - Healthcare utilization
 - Healthcare intensity
 - Costs in 2014 dollars
- Nominal (future) expenditures
 - Also controls for inflation, wage growth and excess medical cost inflation
 - Expenditures in future dollars



Cost Projections

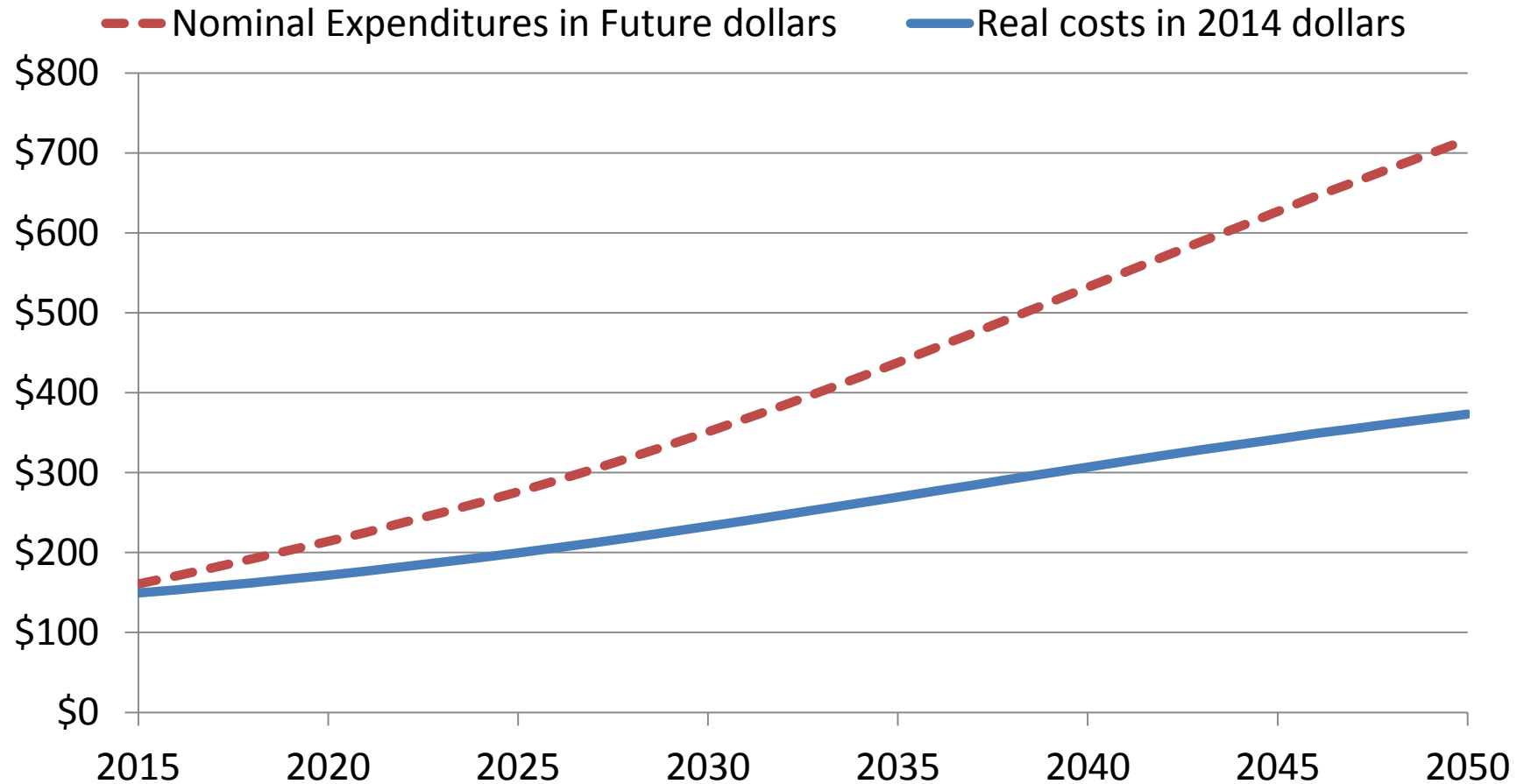
- Projected Real Costs and Nominal Expenditures
- (95% Credible Interval)

	Real Costs (2014)	Nominal Expenditures
2014	\$145	\$150
	(\$117 - \$182)	(\$121 - \$188)
2032	\$247	\$385
	(\$199 - \$309)	(\$310 - \$481)
2050	\$373	\$717
	(\$300 - \$467)	(\$577 - \$897)



Cost Projections

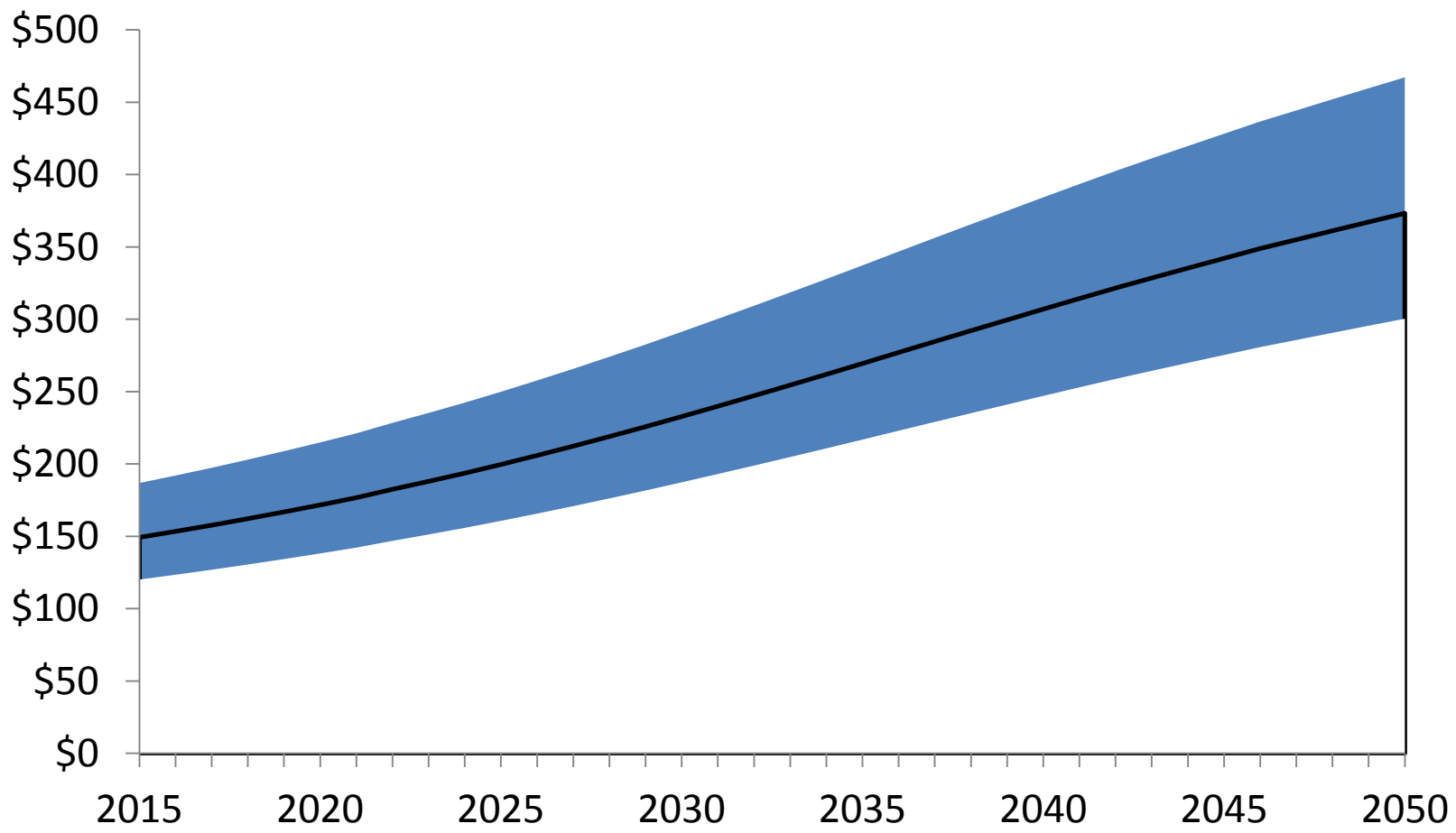
- Real costs in solid lines (2014 \$billions)
- Nominal Expenditures in dashed lines (future \$billions)





95% Credible Interval of Cost Projections,

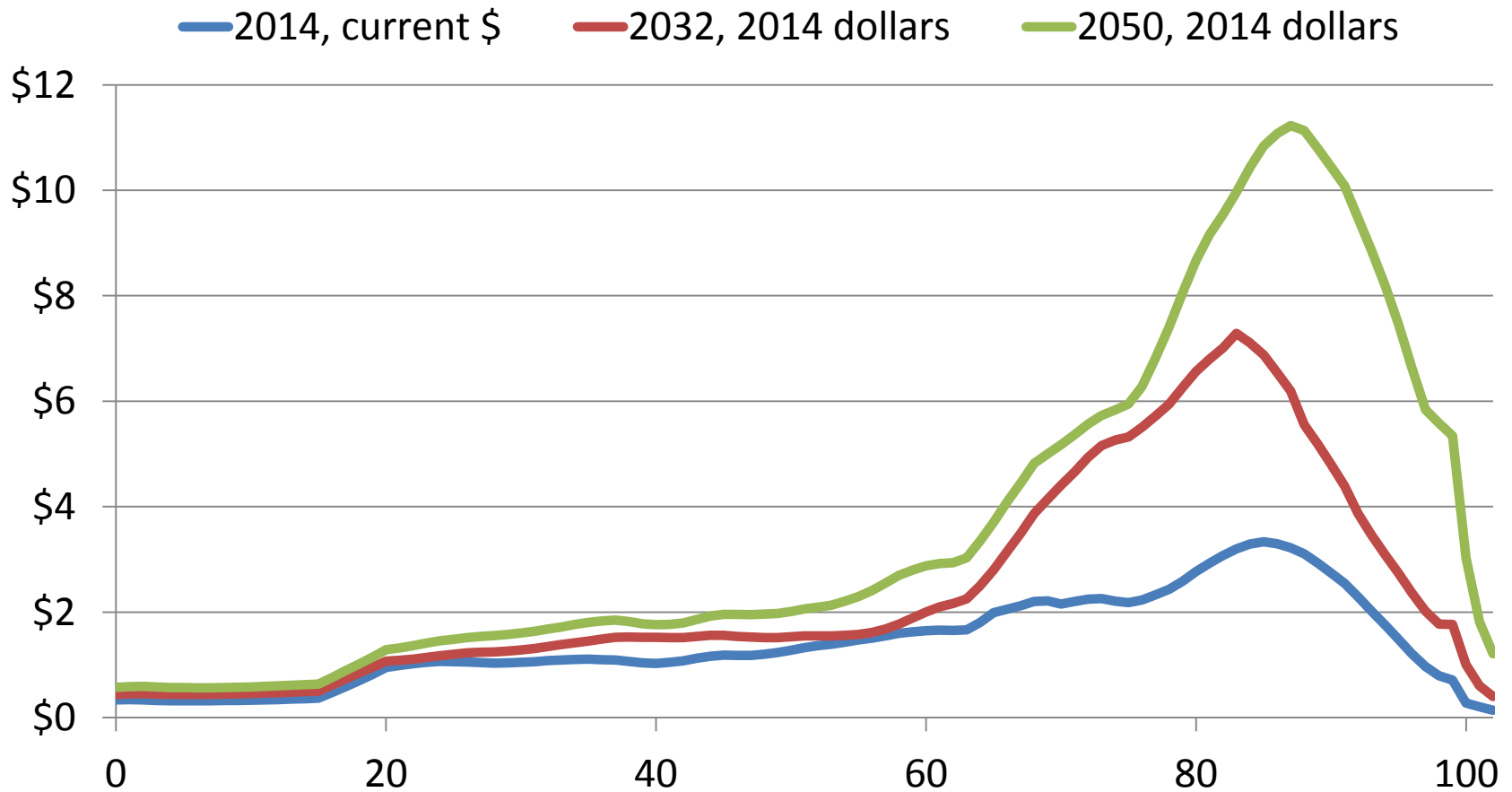
- 2014 \$billions





Age Distribution of Cost Projections, 2014 \$billions

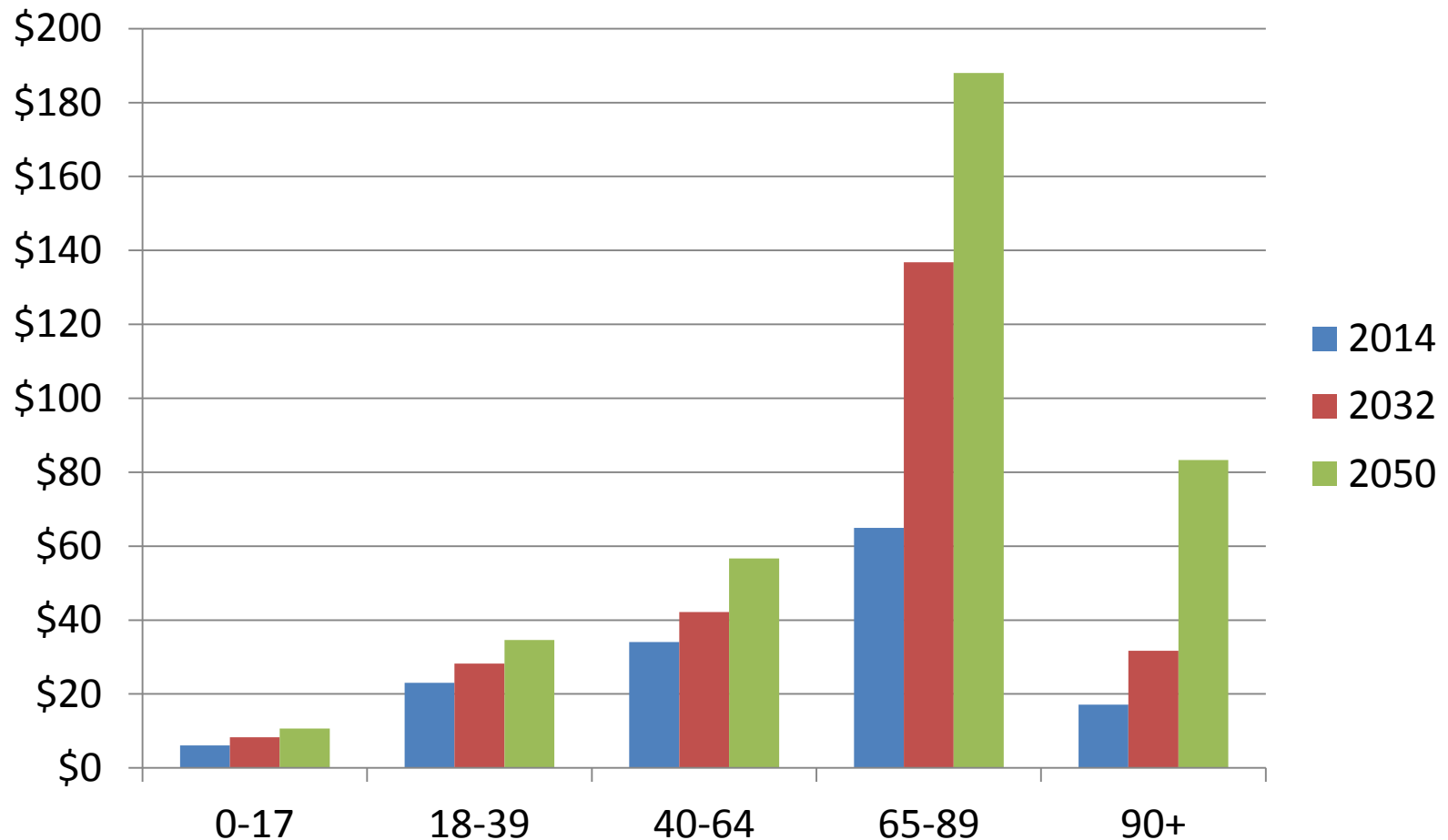
- In 2014, 2032 & 2050





Cost Projections, by Age Group, 2014 \$billions

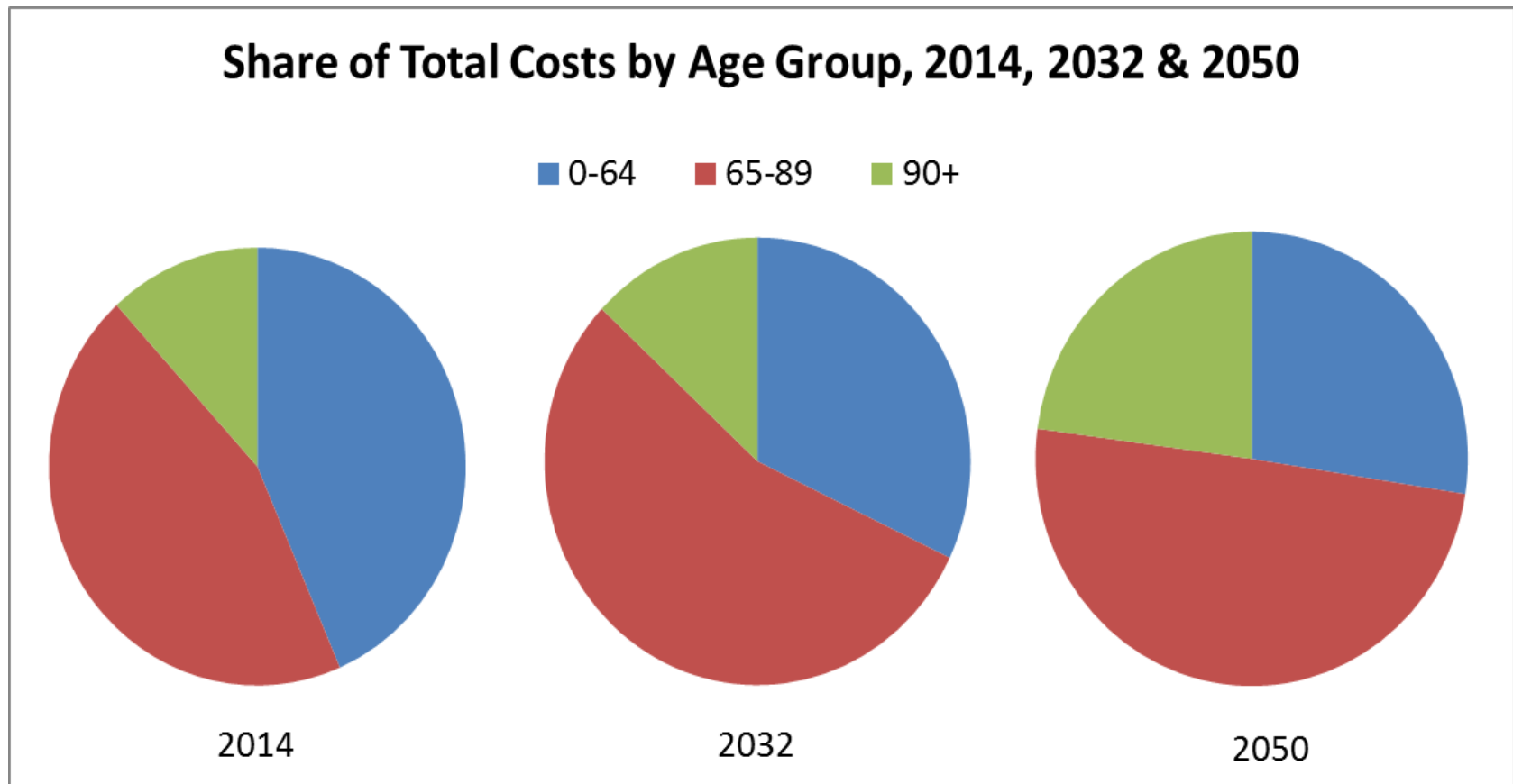
- In 2014, 2032 & 2050





Share of Costs, by Age Group, 2014 \$billions

- In 2014, 2032 & 2050





Projected Costs by Payer, 2014 \$billions

	Government Costs*	Insurance	Patients	Total*
2014	\$47.4	\$25.2	\$74.9	\$145.2
2032	\$96.5	\$40.6	\$113.7	\$247.1
2050	\$154.3	\$59.0	\$165.2	\$373.2

Projected Nominal Expenditures by Payer, \$billions

	Government Costs*	Insurance	Patients	Total*
2014	\$48.9	\$26.0	\$78.0	\$150.5
2032	\$140.1	\$58.7	\$191.3	\$384.6
2050	\$264.1	\$100.2	\$363.6	\$716.9



Projected Share of Costs by Payer, Percent

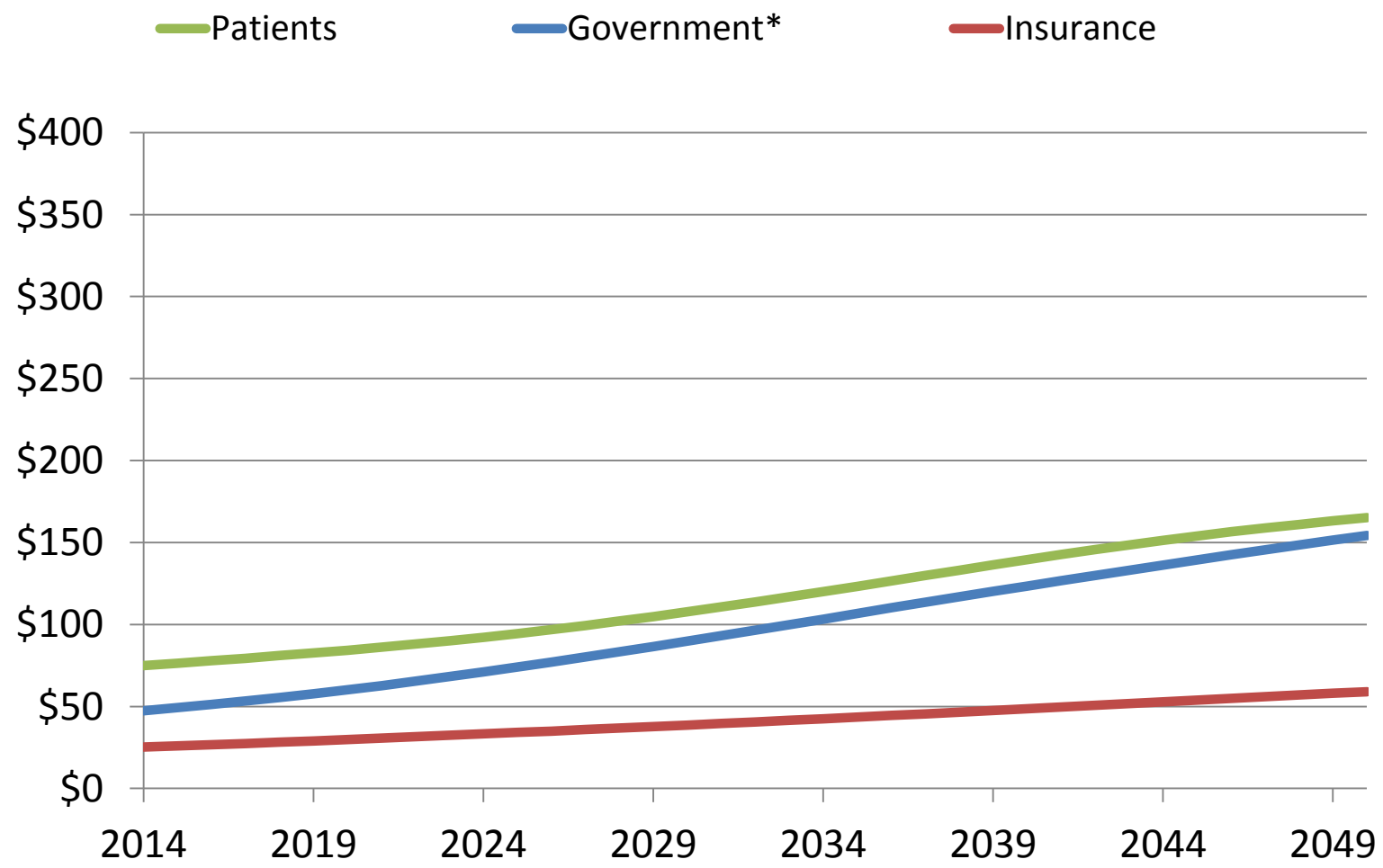
	Government Costs*	Insurance	Patients	Total*
2014	33%	17%	52%	100%
2032	39%	16%	46%	100%
2050	41%	16%	44%	100%

Projected Share of Expenditures by Payer, Percent

	Government Costs*	Insurance	Patients	Total*
2014	32%	17%	52%	100%
2032	36%	15%	50%	100%
2050	37%	14%	51%	100%

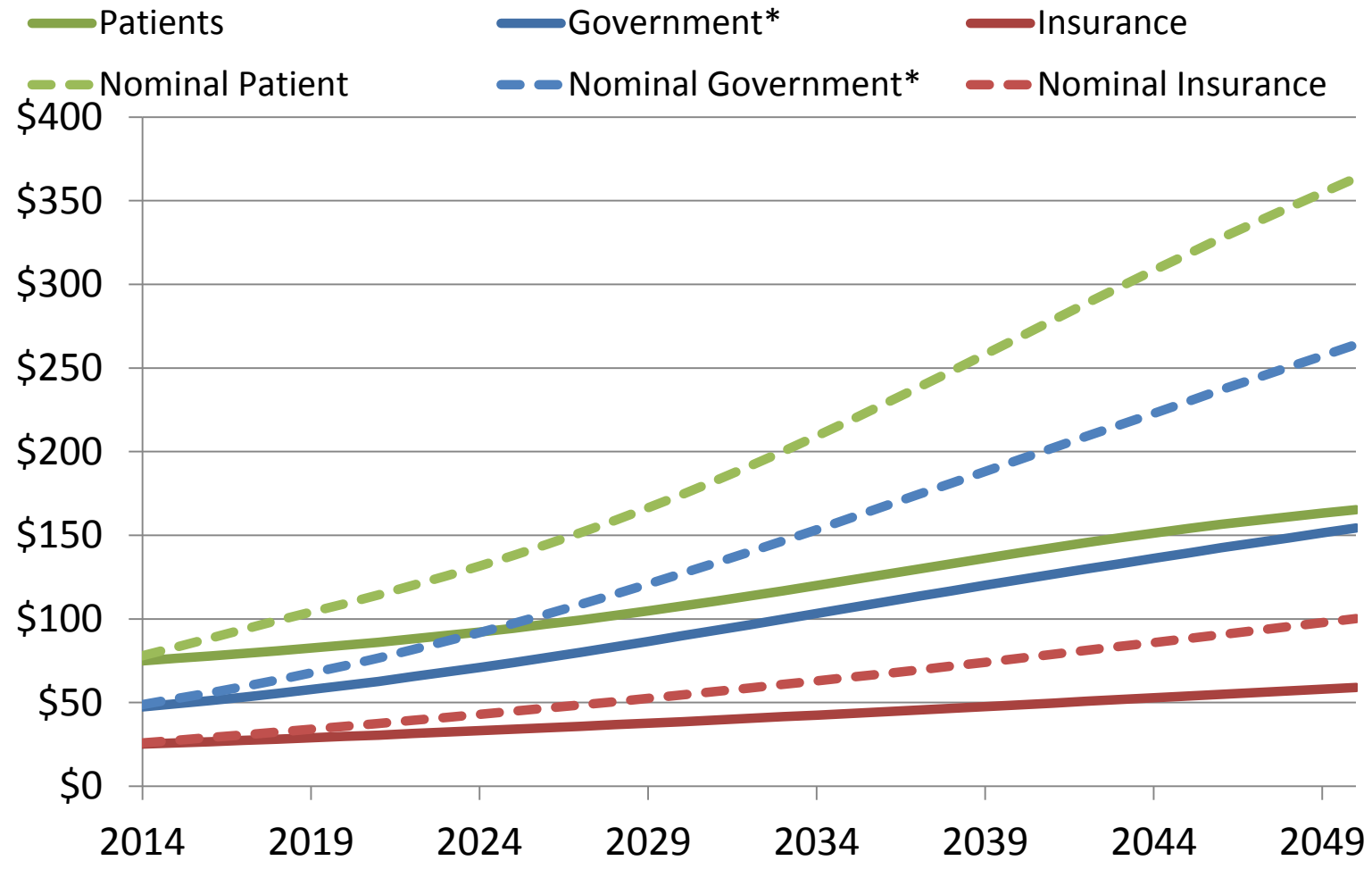


Projected Costs by Payer, 2014 \$billions





Projected 2014 Costs & Nominal Expenditures by Payer, \$billions

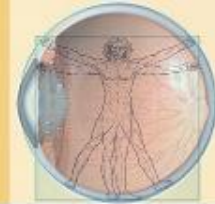




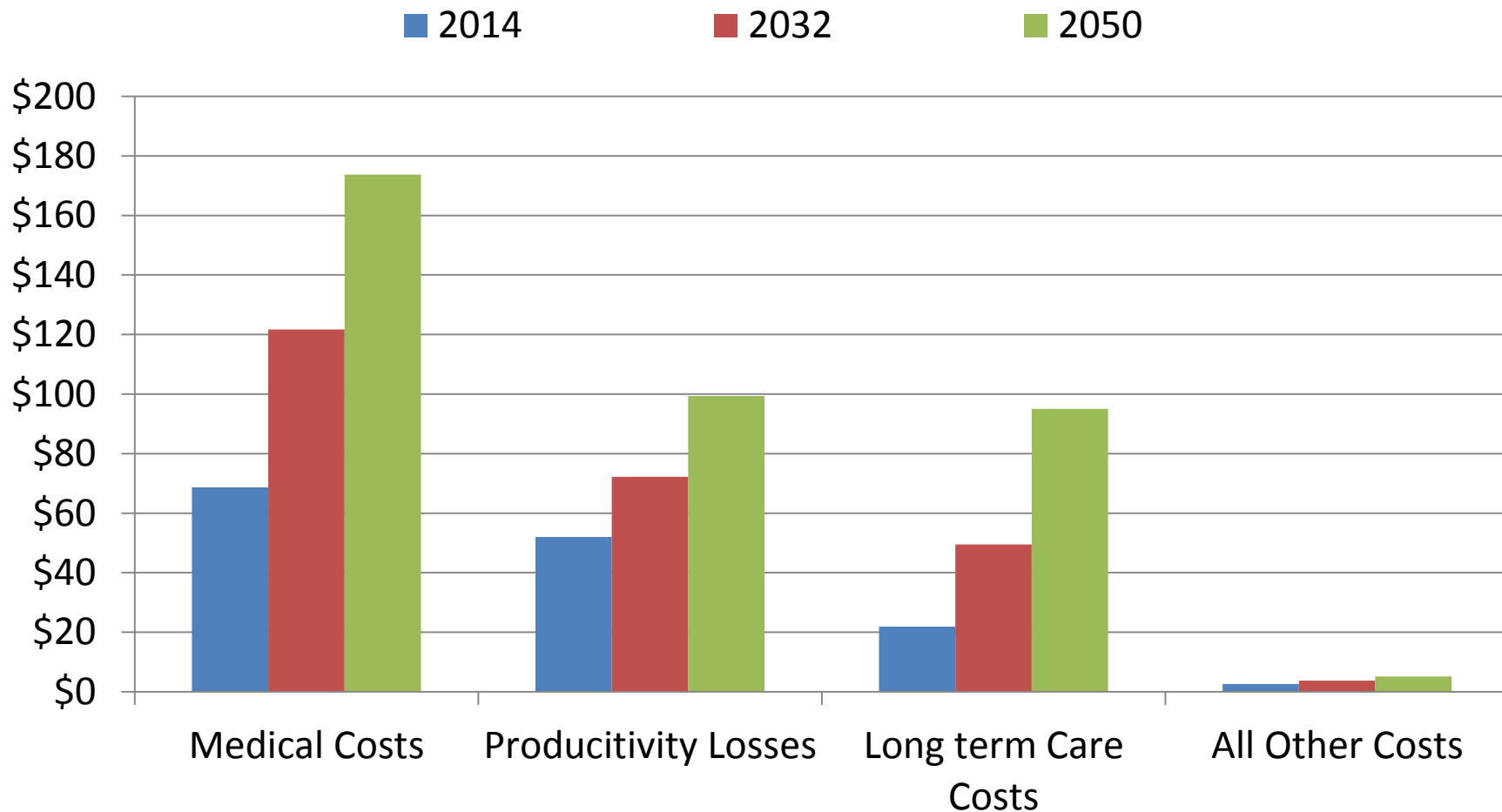
Projected Costs by Category, 2014 \$billions

	Government Programs	Entitlements*	Dead-weight Loss	Other Direct Costs	Productivity Losses	Medical Costs	Long term Care Costs	Total Costs
2014	\$1.0	\$2.3	\$0.9	\$0.8	\$52.0	\$68.7	\$21.9	\$145.2
2032	\$1.1	\$3.7	\$1.4	\$1.2	\$72.2	\$121.7	\$49.5	\$247.1
2050	\$1.3	\$5.4	\$2.1	\$1.7	\$99.3	\$173.7	\$95.0	\$373.2

*not included in total costs

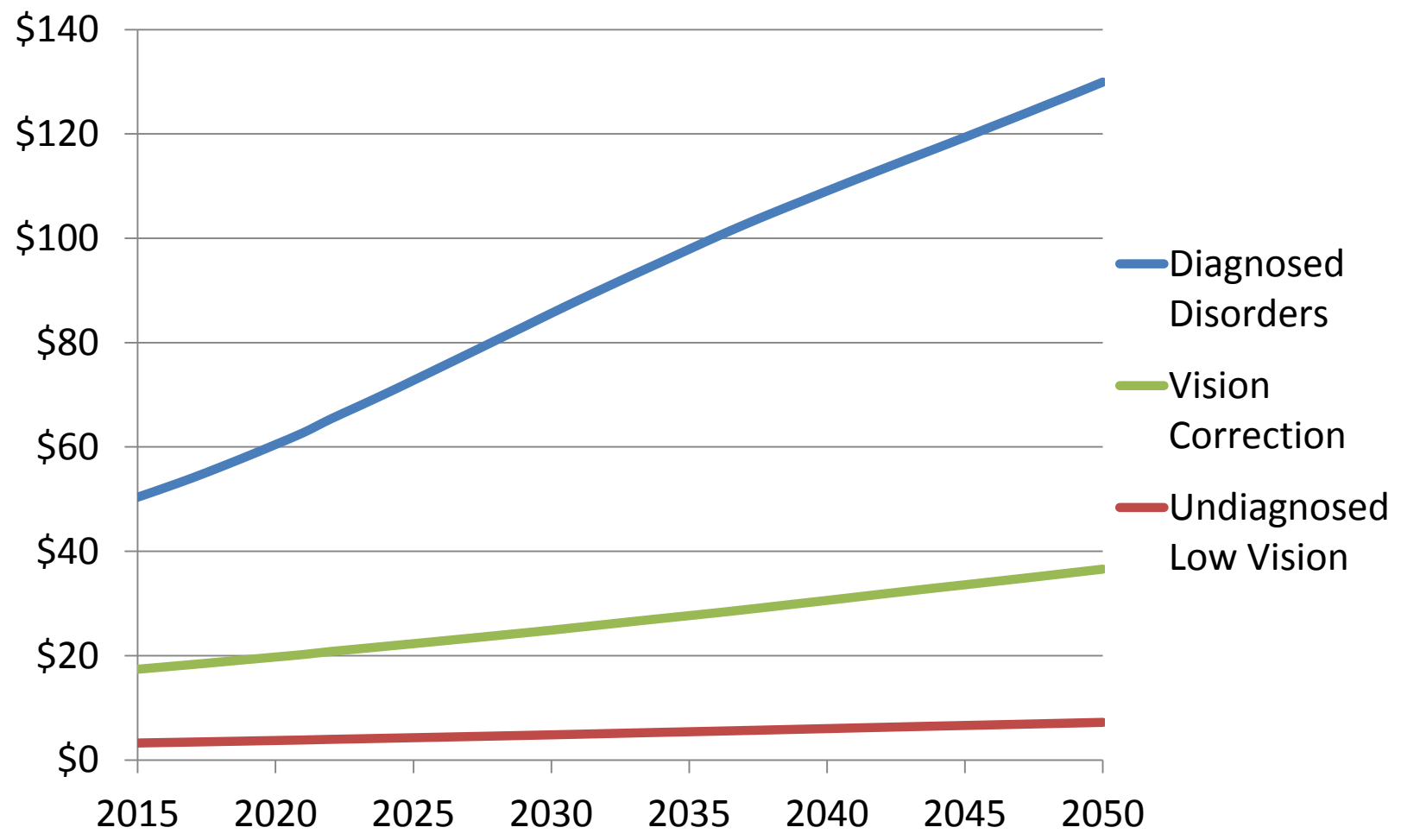


Projected Costs by Category, 2014 \$billions



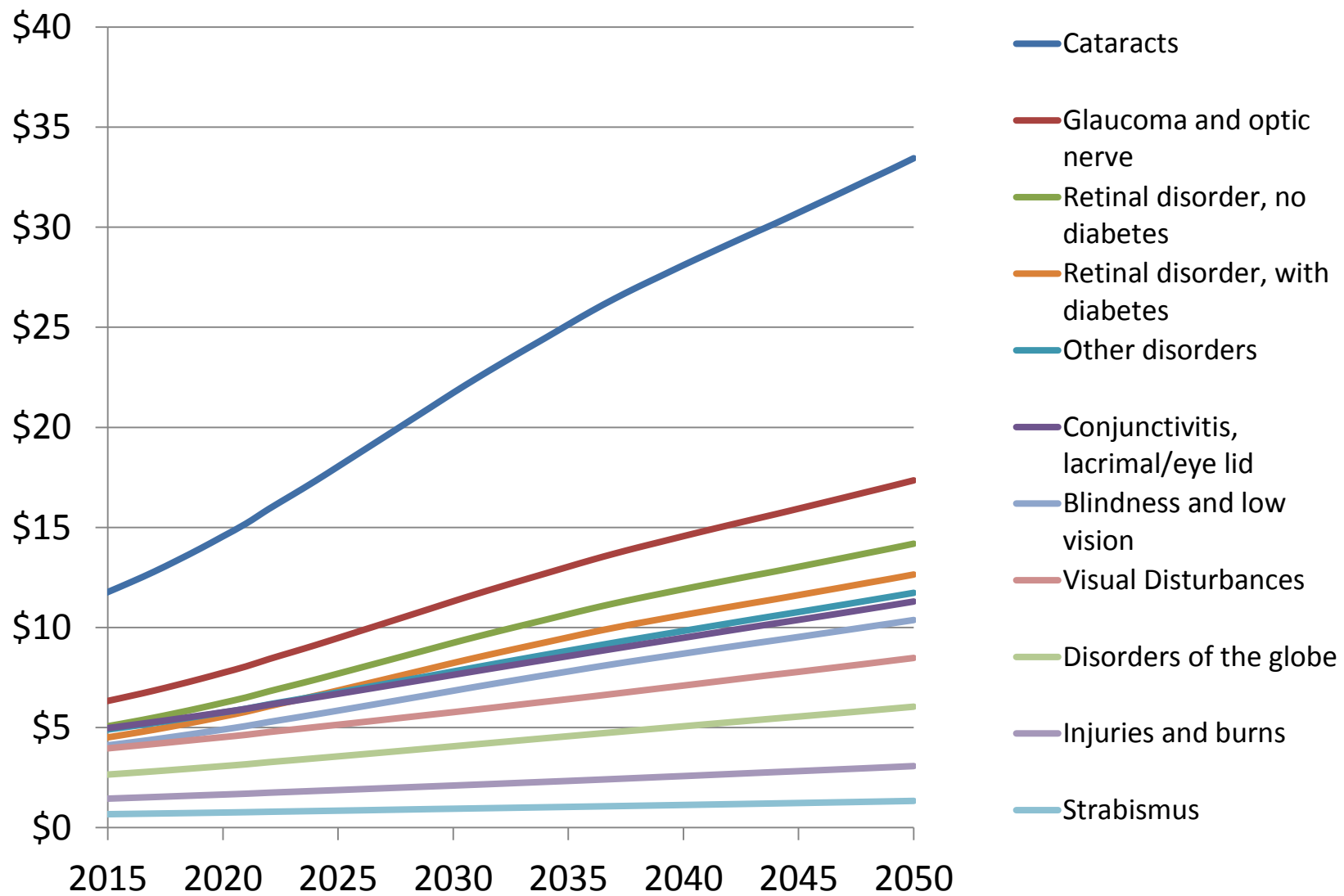


Projected Medical Costs by Type, 2014 \$billions





Diagnosed Disorder Medical Costs, \$billions





Key Findings

- Prevalence and costs will shift to conditions that are
 - More prevalent at older ages
 - More common among minorities
- The baby-boomer effect will dramatically increase prevalence and costs
 - Boomers are aging into Medicare and high incidence ages over the next 20 years
- The 90+ population will see the highest rates of growth in prevalence and costs by 2050
 - Very little data available for this population



Conclusions

- From Vision Problems in the US database we know
 - *“the current landscape of vision problems”*
- From the Cost of Vision Problems report we understand
 - *“the cost and consequences of these vision problems”*
- The Future of Vision brings this knowledge together and shows where we are headed
 - *“in the future if nothing is done”*
- We produce forecasts not to predict the future, but to help us understand where we are headed



So we can get back to the question:

*“What can we do to help
reduce the toll of vision
problems?”*



The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of NORC at the University of Chicago or Prevent Blindness



Thank You!



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