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## **Eye Disease Among Americans**

# Eye Disease Among Americans

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A National Summit**



# Eye Disease Among Americans

## Principal Investigators

- Sheila K. West
- Ron and Barbara Klein
- James Tielsch
- Karen Cruickshanks
- Cristina Leske
- Hugh Taylor
- Paul Mitchell
- Paulus de Jong
- Ralf Buhrmann
- Current update by Benita O'Colmain and David S. Friedman
- 2004 also with Nathan Congdon, John Kempen and James Tielsch

# Eye Disease Among Americans

- Vision loss from macular degeneration, glaucoma, and diabetes can be prevented
- Population is aging -- more precise estimates of disease burden are needed

# Eye Disease Among Americans

## Aging Population

	<i>≥ 65 Years</i>	<i>≥ 85 Years</i>
<b>2010</b>	40.2	5.8
<b>2030</b>	72.1	8.7
<b>2050</b>	88.5	<b>19.0</b>

Millions of Americans

# Eye Disease Among Americans **Methods**

- Identified large population-based studies
- Obtained primary data from investigators
- Combined data using meta-analytic techniques and data modeling

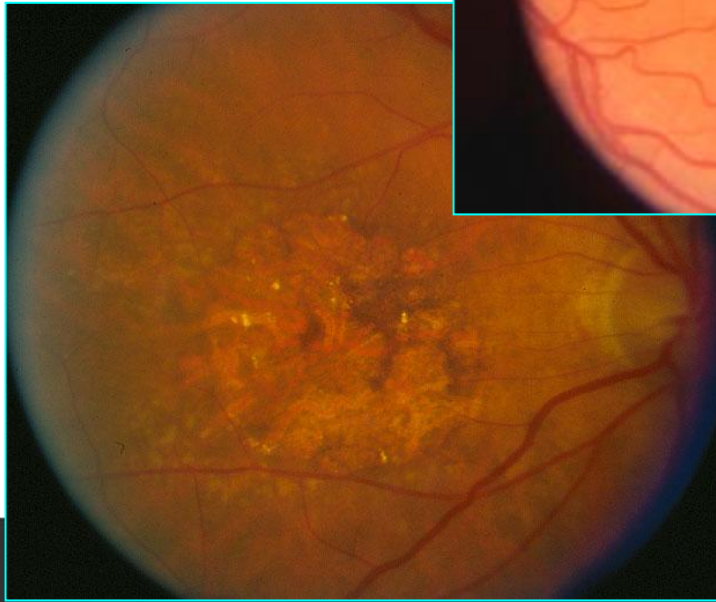
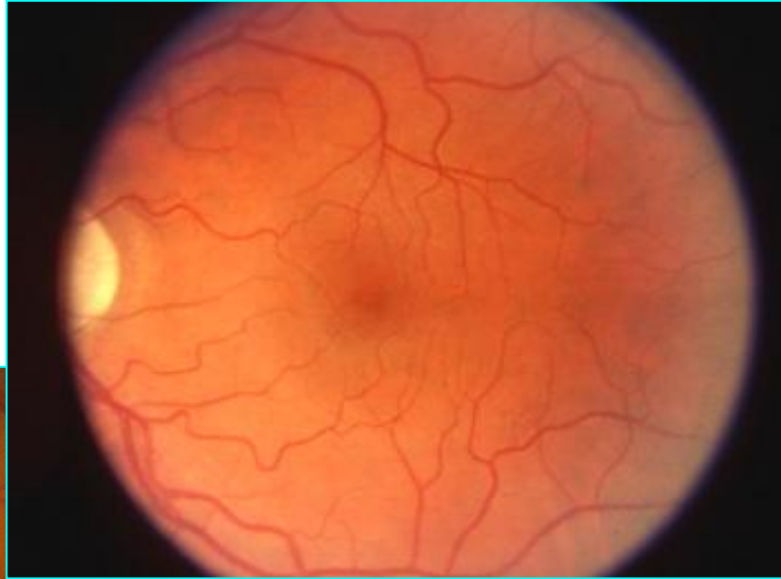
# Eye Disease Among Americans

## Included Studies

- Baltimore Eye Survey
- Barbados Eye Study
- Beaver Dam
- Blue Mountains
- Los Angeles Latino Eye Study
- Kongwa Eye Project
- Proyecto Ver
- Rotterdam Eye Study
- San Luis Valley
- Salisbury Eye Evaluation
- Vision Impairment Project
- **San Antonio Heart Study**
- **Wisconsin Epidemiologic Study of Diabetic Retinopathy**

# Eye Disease Among Americans

## Macular Degeneration



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# Eye Disease Among Americans

## Macular Degeneration

- Once vision is lost it is generally permanent
- National Eye Institute demonstrated that high-dose vitamin therapy can reduce the rate of vision loss by 30%
- Intravitreal medications and laser therapies can treat later stages of neovascular disease

# Eye Disease Among Americans

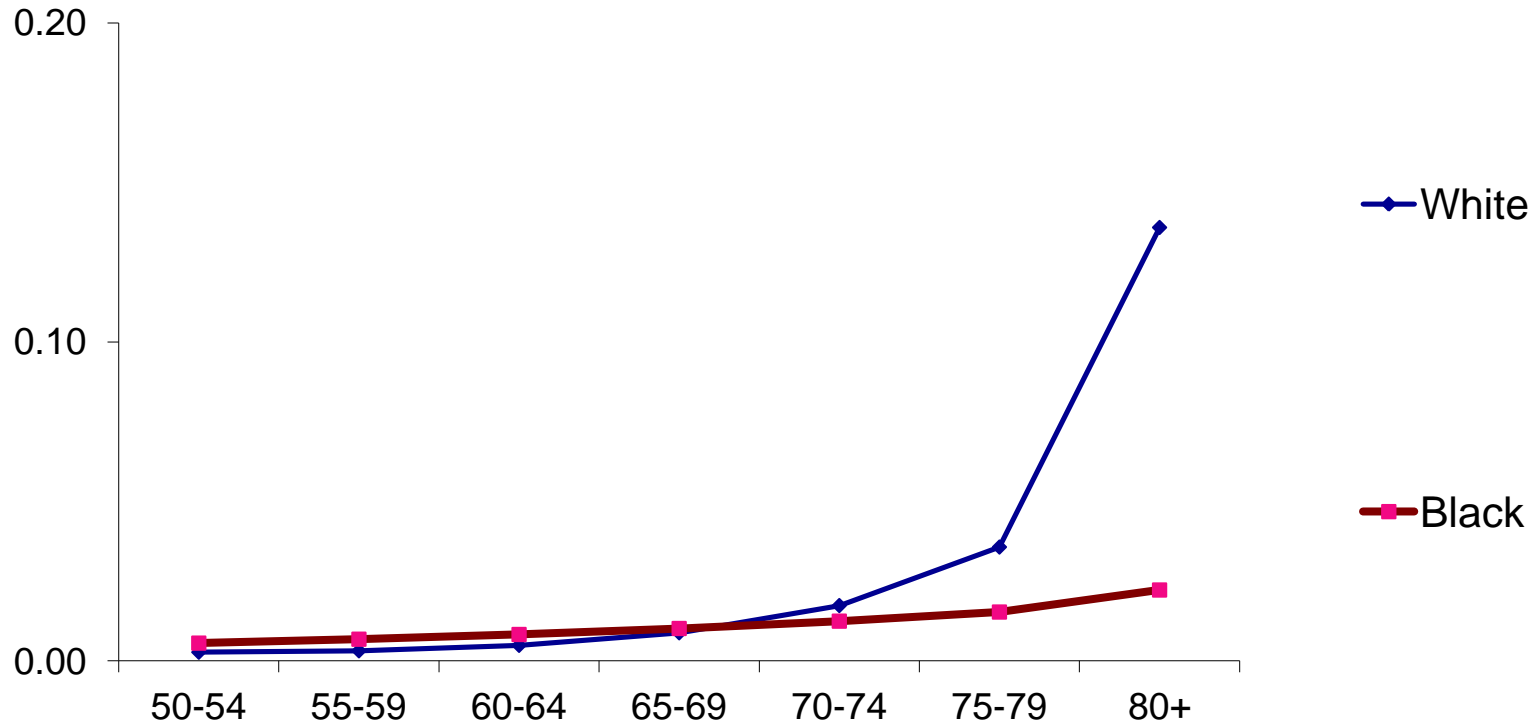
## Macular Degeneration

**Geographic AMD:** Discrete area of retinal depigmentation at least  $175\mu$  in diameter in central  $3,000\mu$

**Neovascular AMD:** Serous or hemorrhagic detachment, subretinal fibrosis...

# Eye Disease Among Americans

## Macular Degeneration

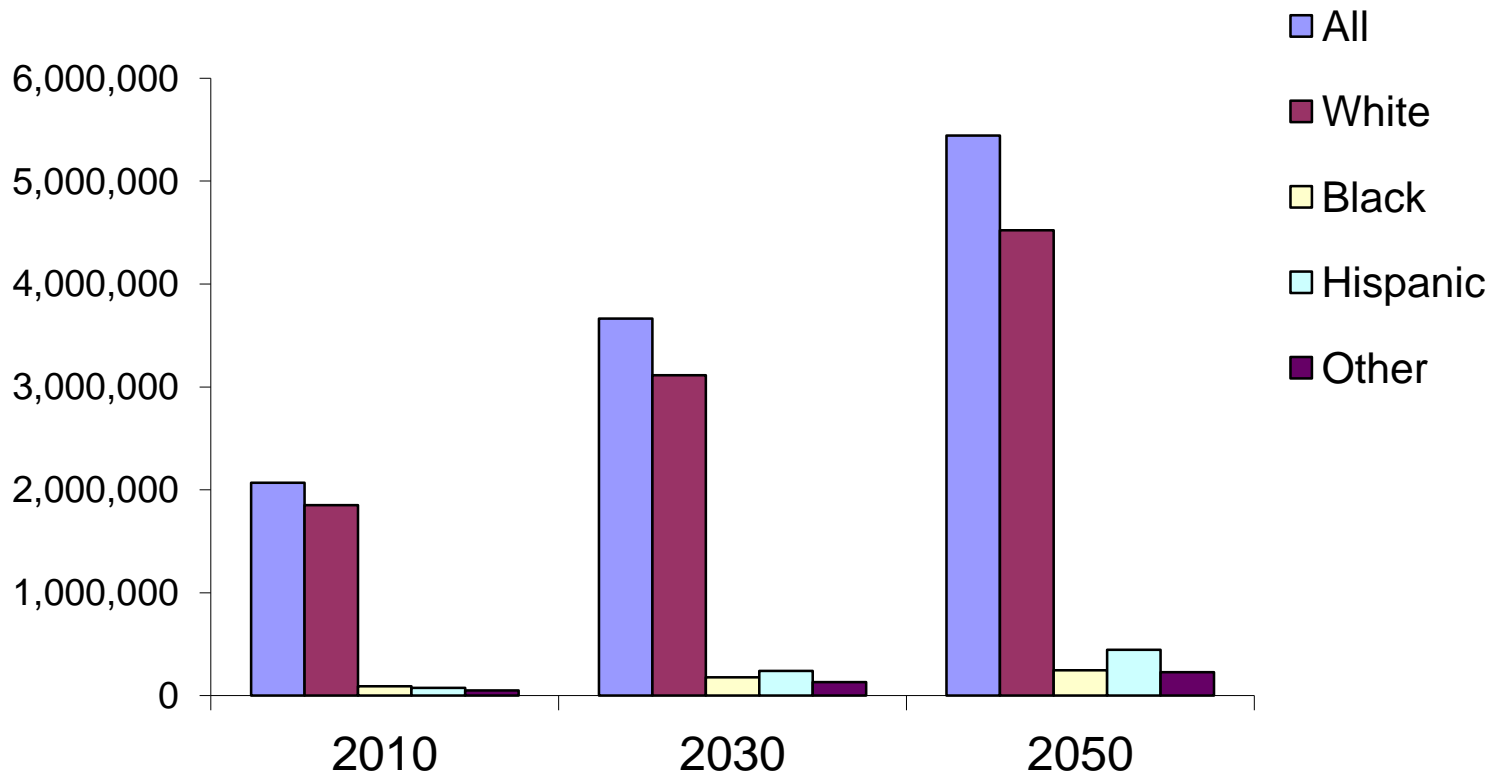


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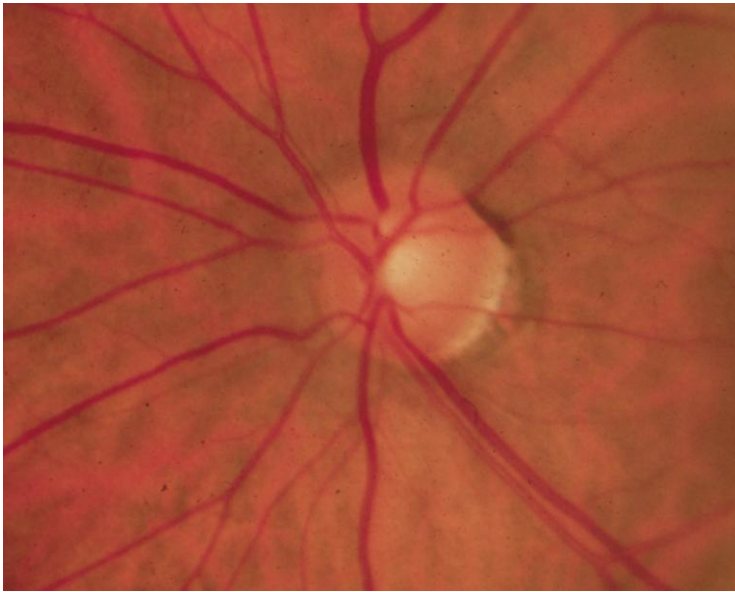
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## Macular Degeneration



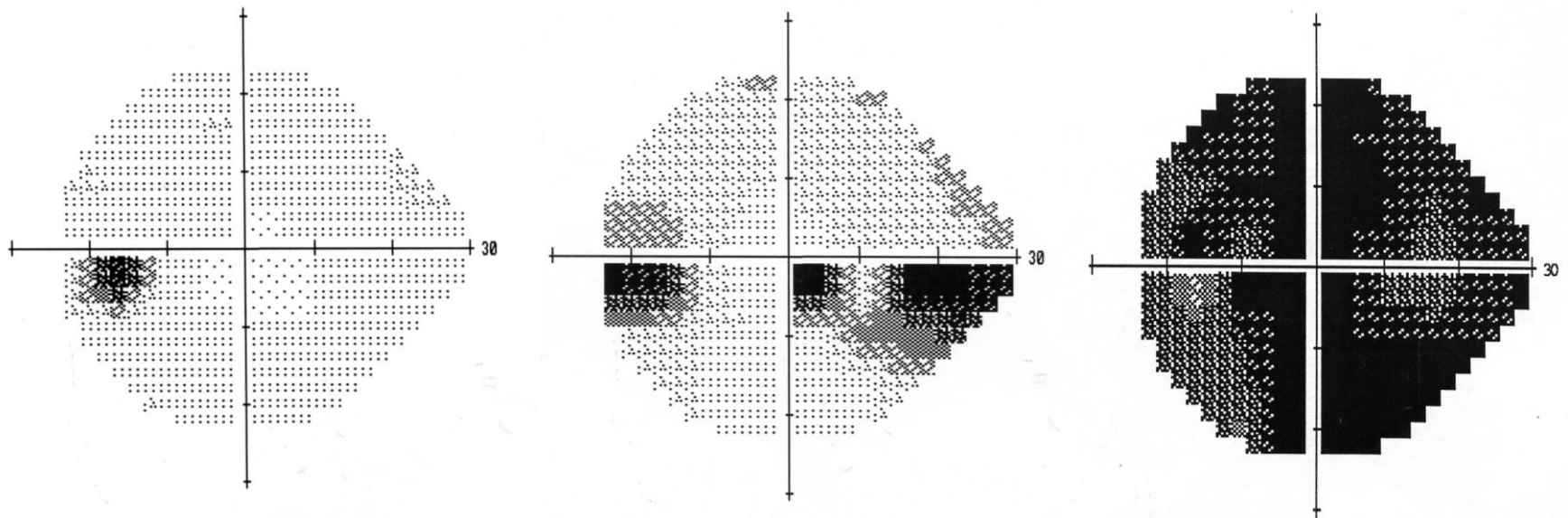
# Eye Disease Among Americans

## Glaucoma



# Eye Disease Among Americans

## Glaucoma



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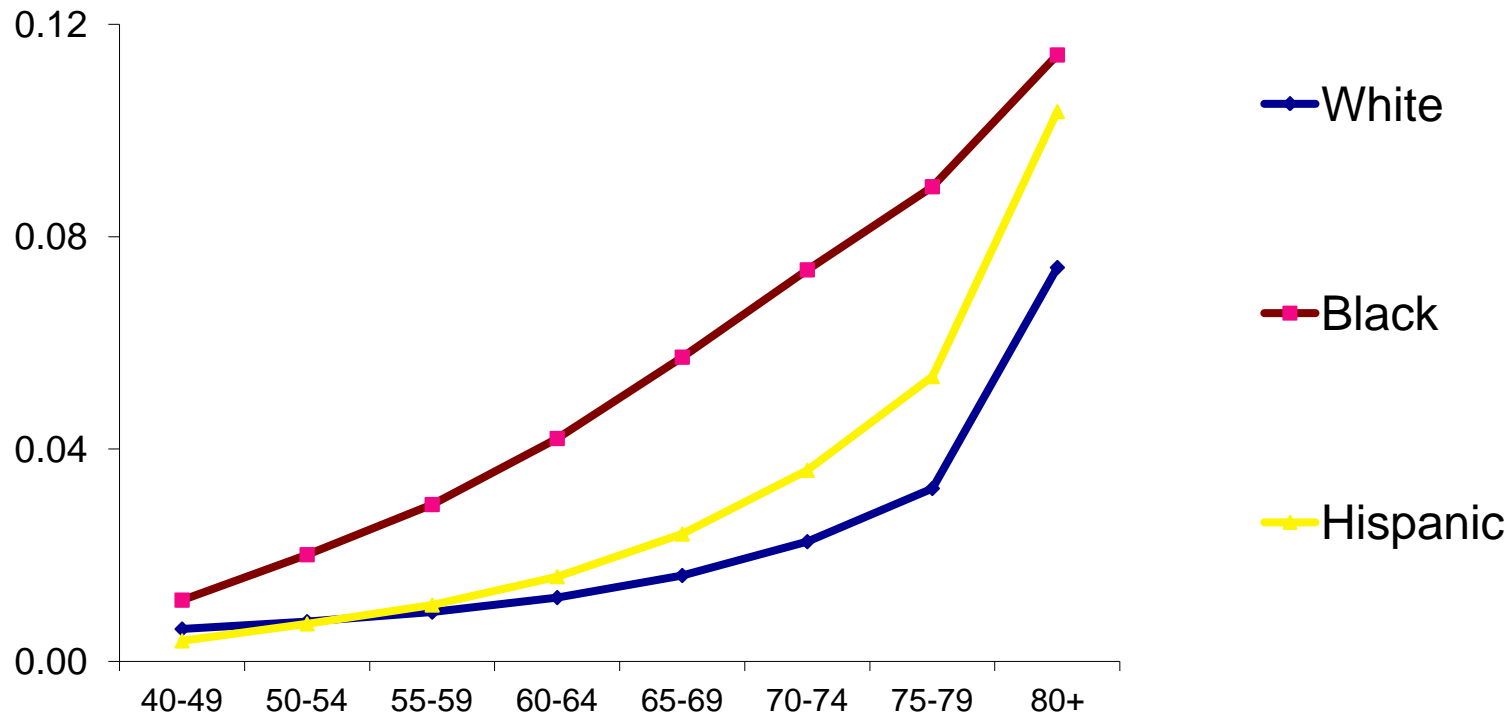
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## Glaucoma

- Methods varied across studies
- Required visual field loss and/or optic nerve damage in definition
- Definition did not include eye pressure

# Eye Disease Among Americans

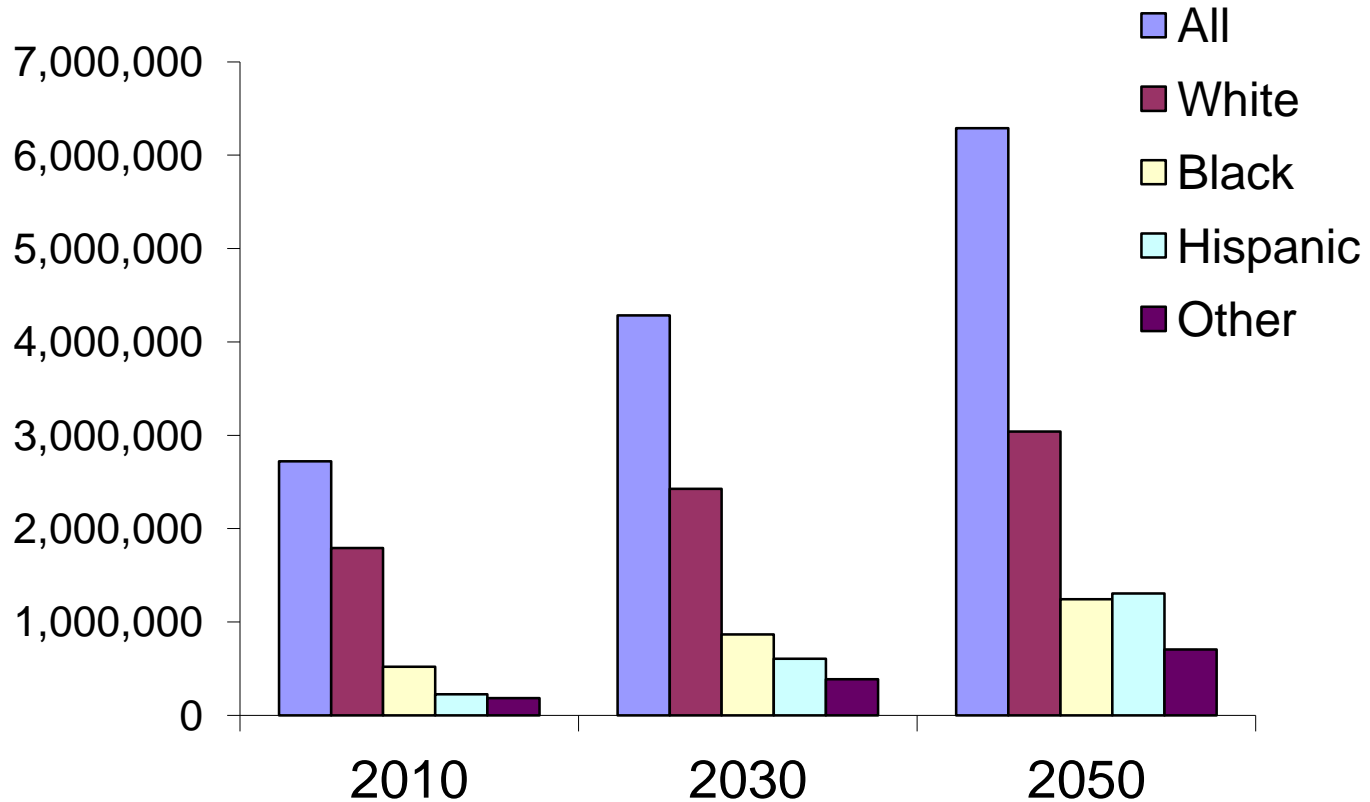
## Glaucoma





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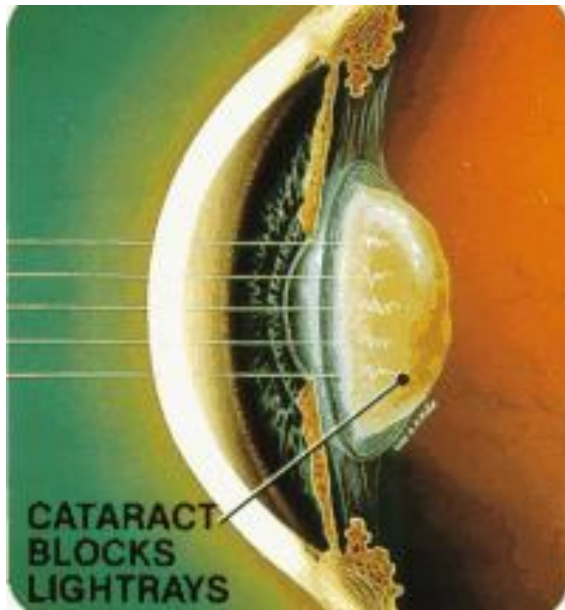
## Glaucoma



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## Cataract

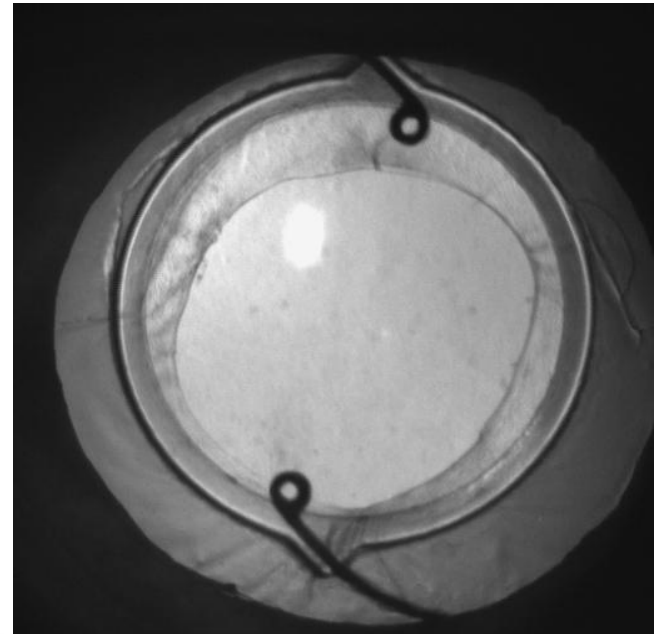
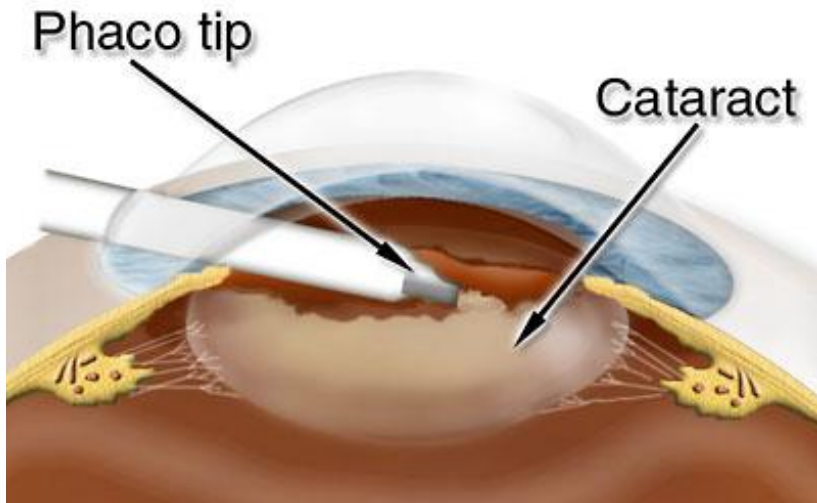
- Lens in the eye becomes opaque
- Light rays are blocked



# Eye Disease Among Americans

## Cataract

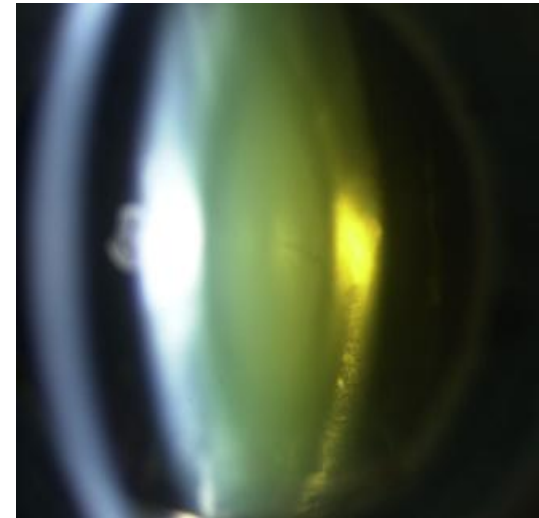
- No preventive therapy available
- Surgery highly successful at curing vision loss



# Eye Disease Among Americans

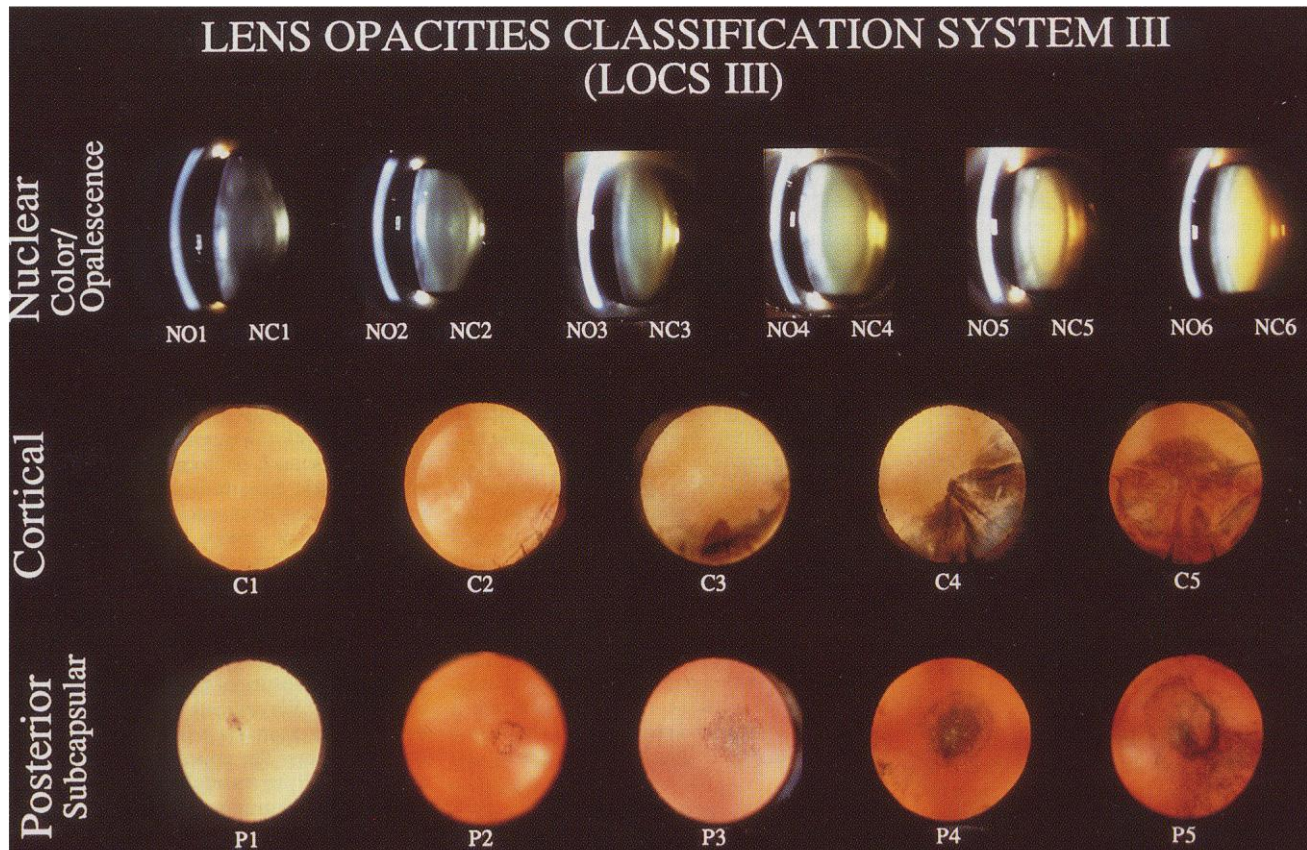
## Cataract

- Used only studies with photographic evaluation of cataract status
- Estimated rates of vision-impairing cataract



# Eye Disease Among Americans

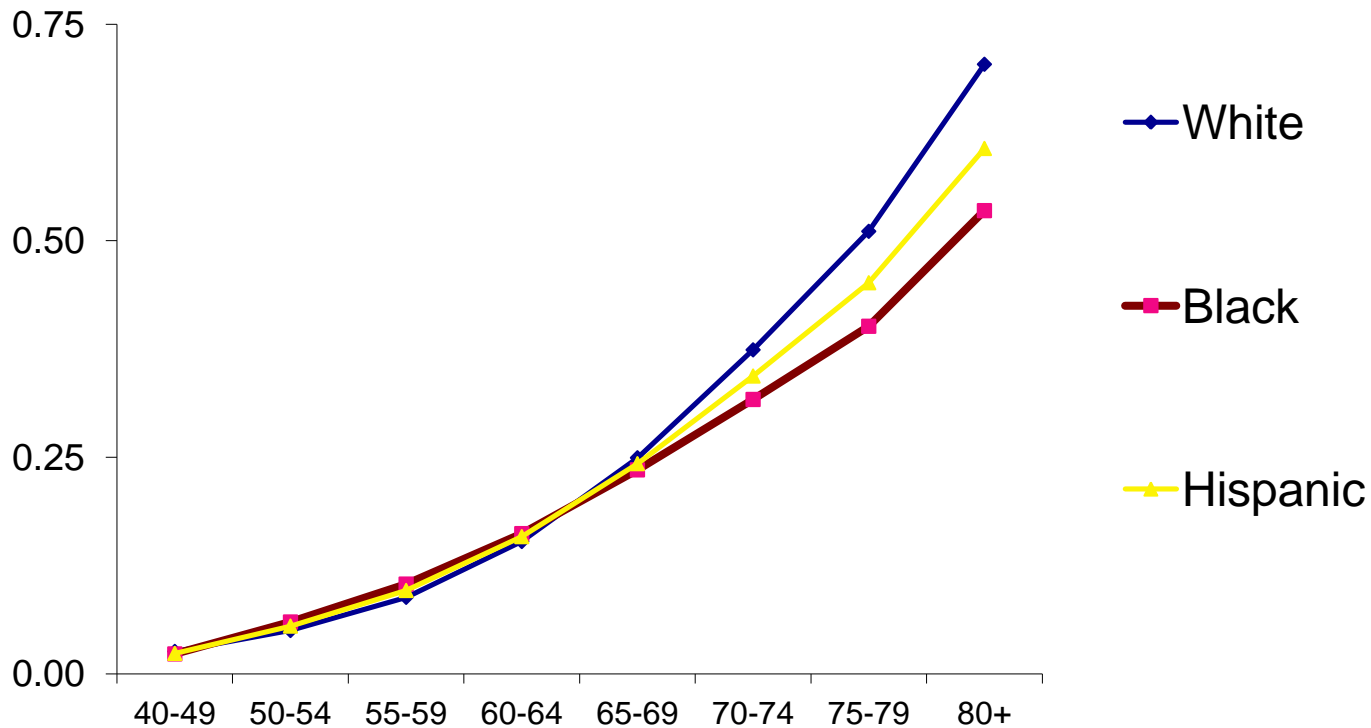
## Cataract



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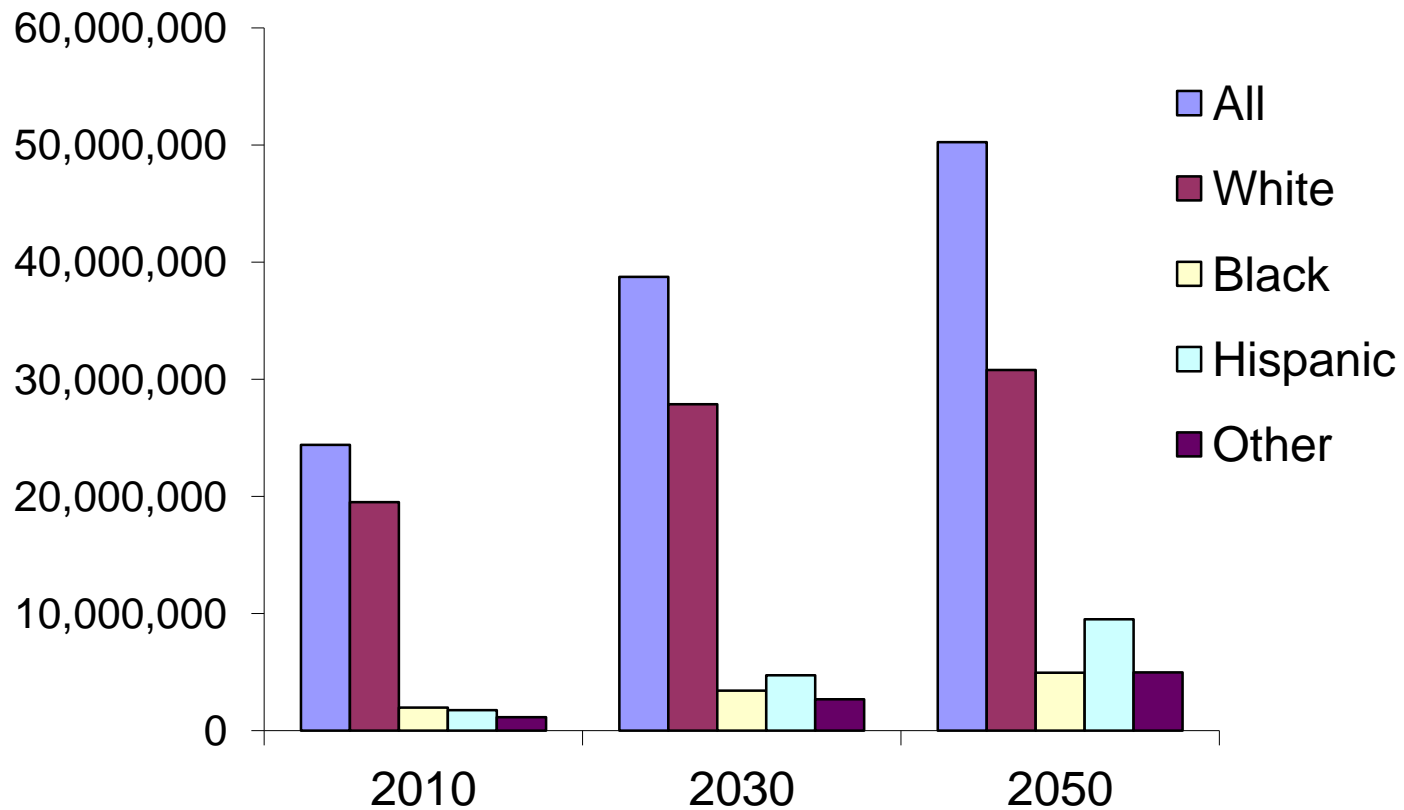
# Eye Disease Among Americans

## Cataract



# Eye Disease Among Americans

## Cataract



# Eye Disease Among Americans

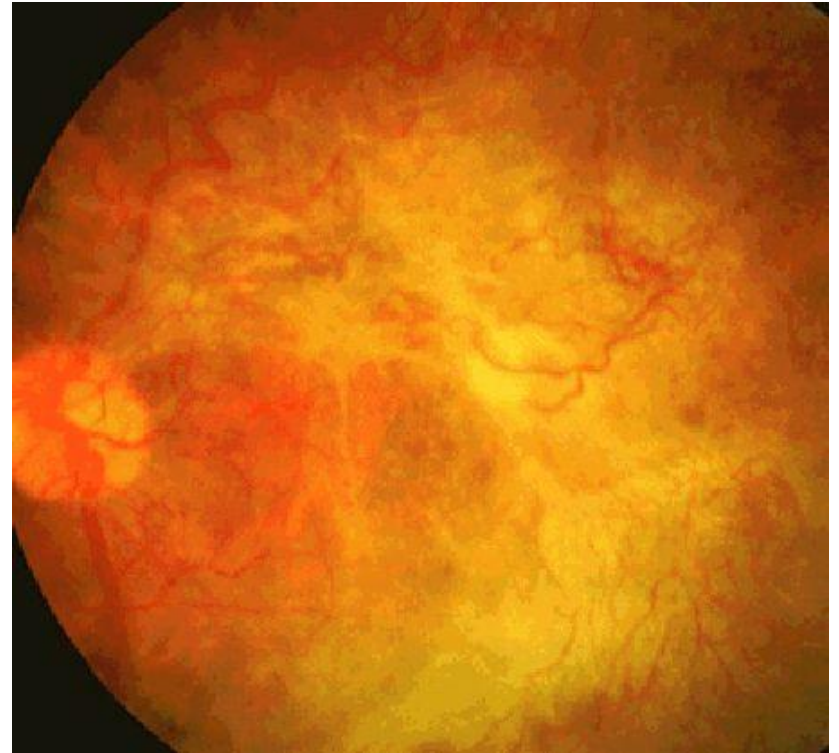
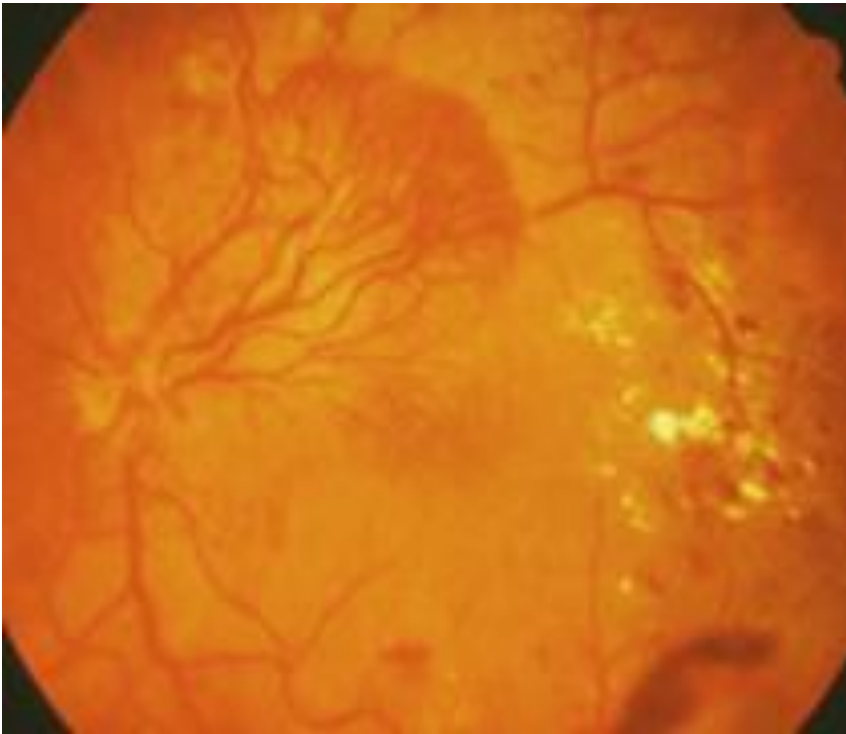
## Diabetic Macular Edema





# Eye Disease Among Americans

## Proliferative Diabetic Retinopathy



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## Diabetic Retinopathy

- Often affects working age individuals
- Blindness is preventable in over 90% of diabetics
- Asymptomatic, so routine evaluation essential

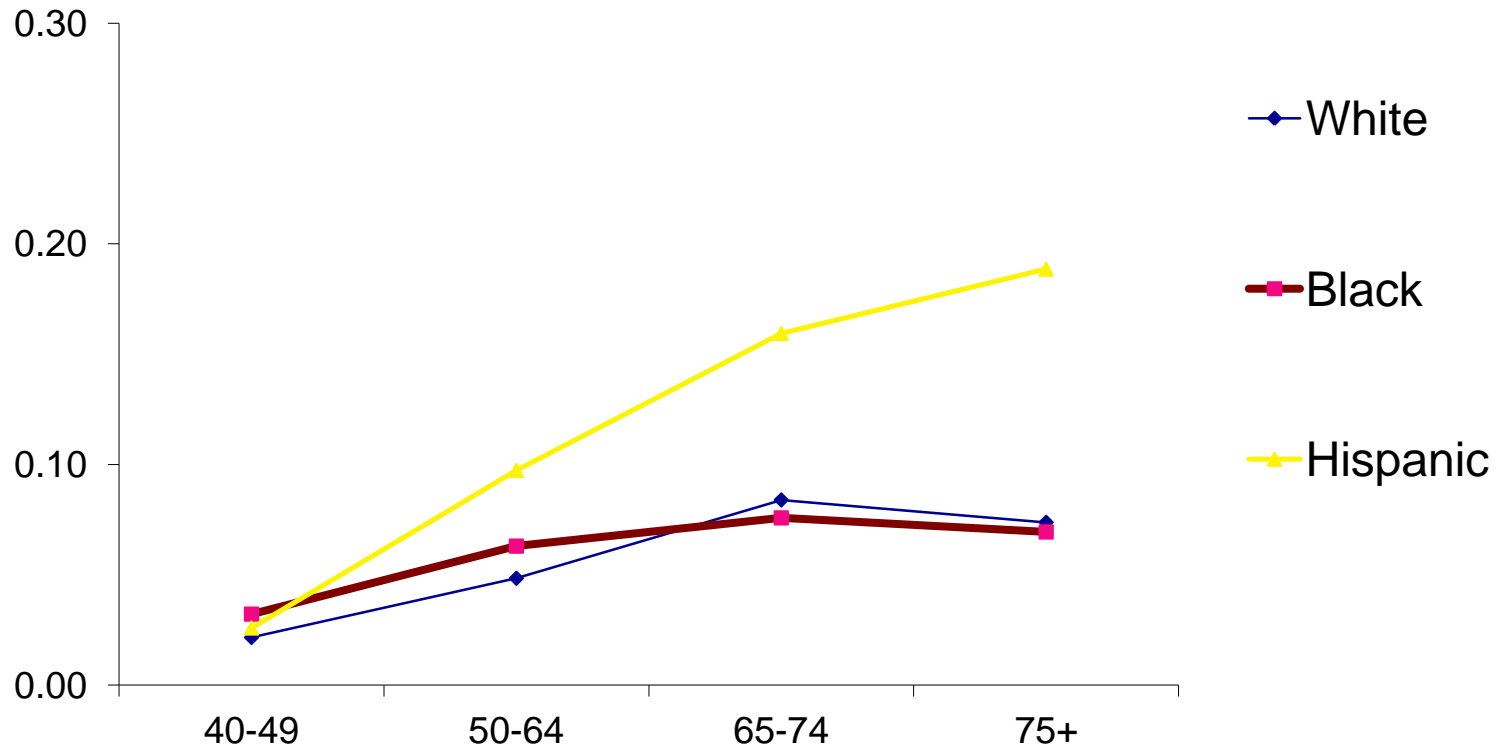
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## Diabetic Retinopathy

- Data presented are for the presence of any diabetic retinopathy
- Had to estimate the numbers of diabetics to come up with absolute numbers affected

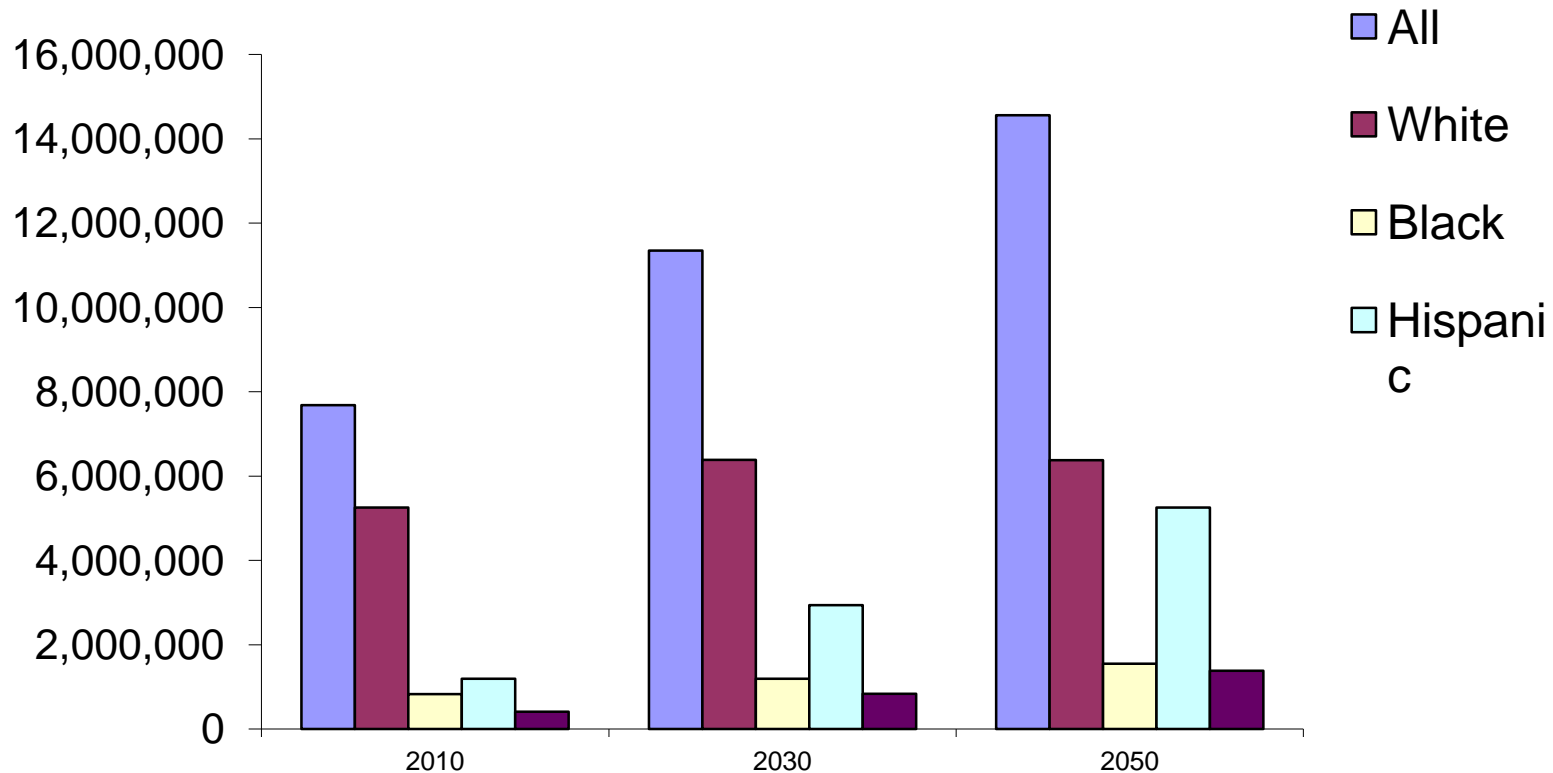
# Eye Disease Among Americans

## Diabetic Retinopathy



# Eye Disease Among Americans

## Diabetic Retinopathy



# Eye Disease Among Americans

## Diabetic Retinopathy

	<b>Any Retinopathy</b>	<b>Vision- Threatening Retinopathy</b>
<b>Number of Cases</b>	7,680,000	1,690,000
<b>% of Adults with DM</b>	40%	8.8%
<b>% of General Population</b>	5.4%	1.2%

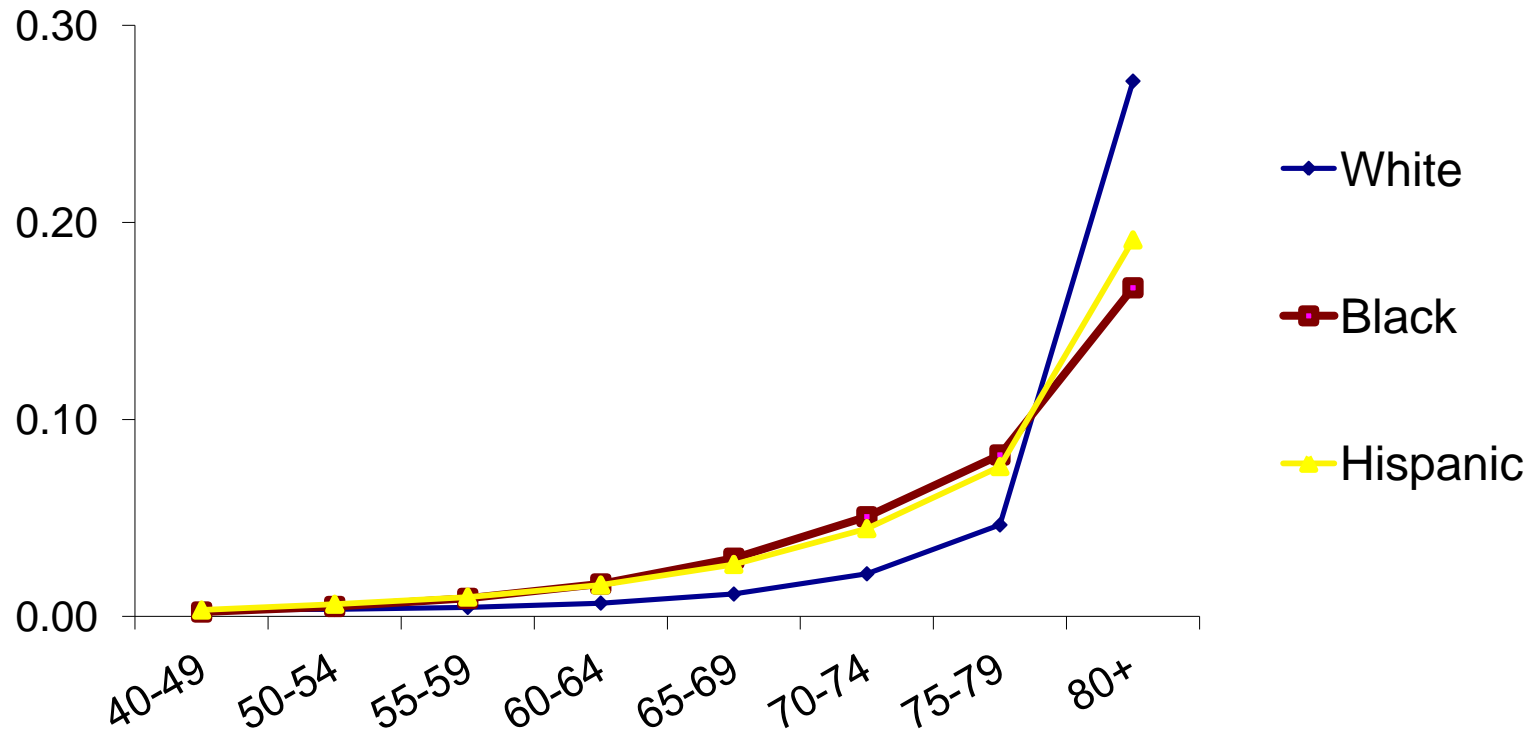
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## Low Vision

- Visual acuity  $< 20/40$  was used in most studies (includes blind individuals)
- It is often difficult to assign a single cause

# Eye Disease Among Americans

## Low Vision and Blindness



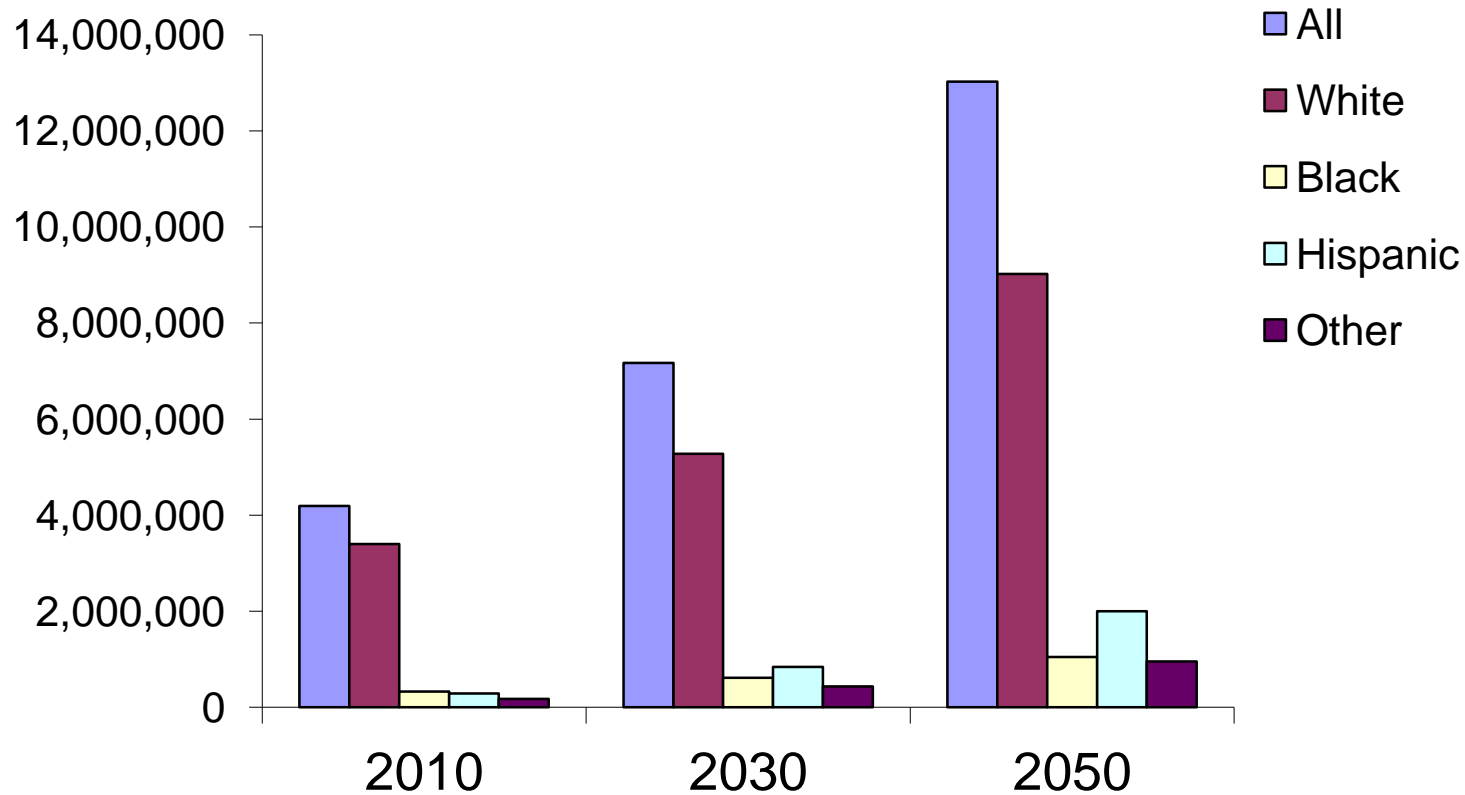
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# Eye Disease Among Americans

## Low Vision and Blindness



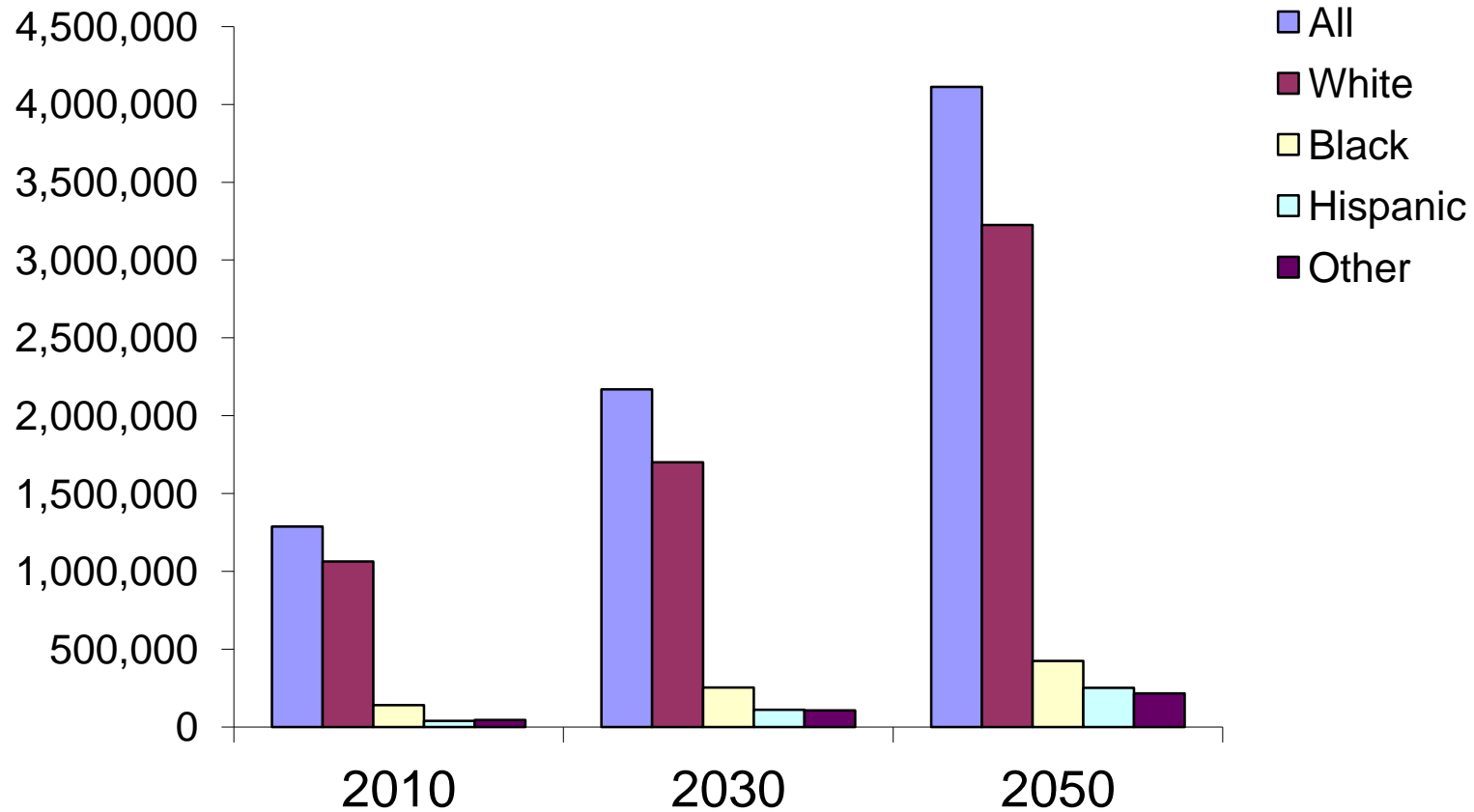
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## Blindness

- Visual acuity  $\leq 20/200$  was used
- At times multiple factors can play a role

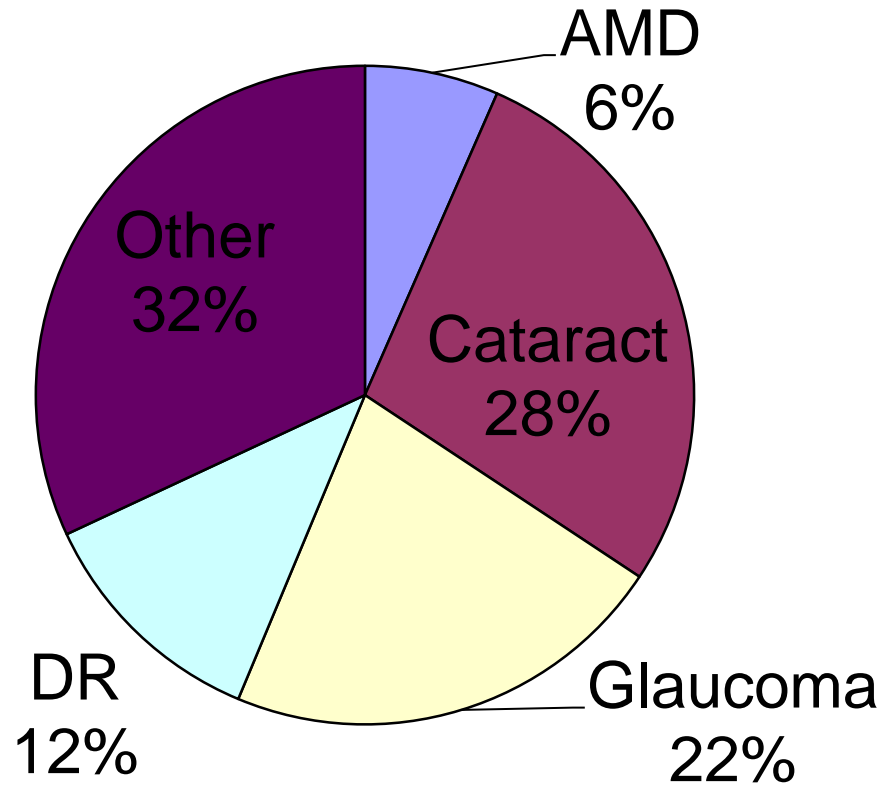
# Eye Disease Among Americans

## Blindness



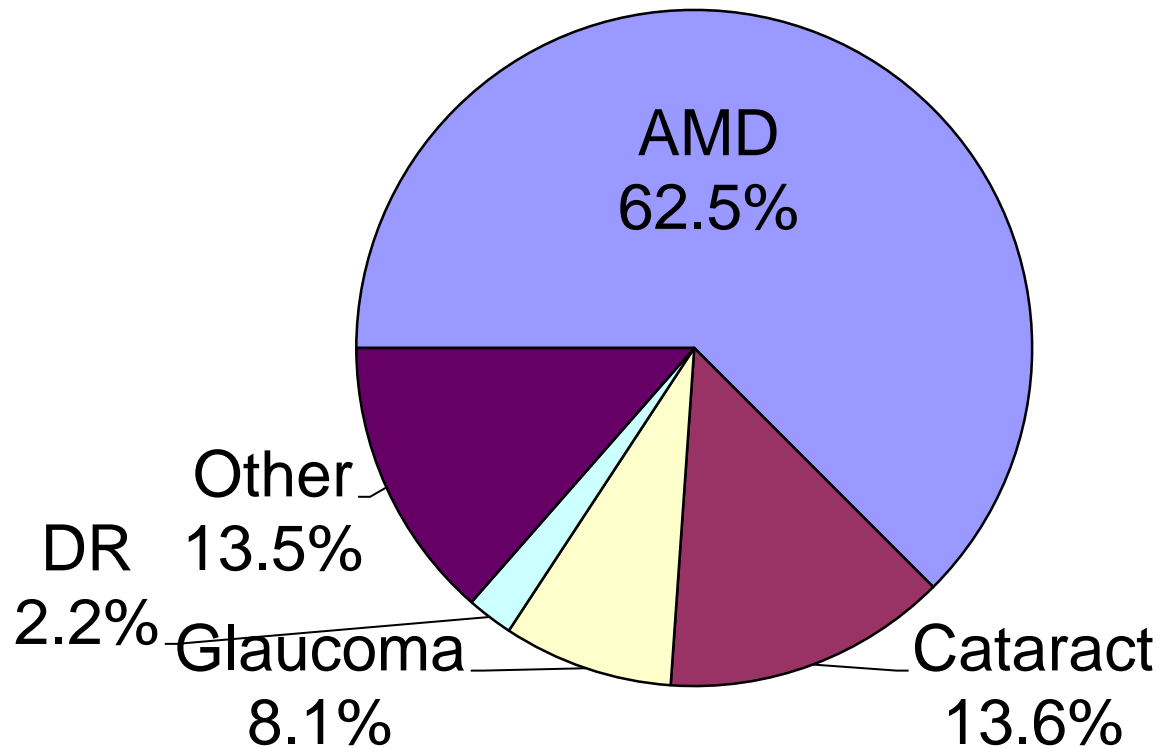
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## Causes of Blindness Among Blacks



# Eye Disease Among Americans

## Causes of Blindness Among Whites



# Eye Disease Among Americans

## Blindness

- Leading causes vary by race
- AMD in whites
- Glaucoma and cataract in blacks
- Less clear in other racial groups

# Eye Disease Among Americans

## Conclusion

- 4.2 million Americans visually impaired
- 1.3 million Americans blind
- 13 million visually impaired, and 4.1 million blind in 2050 if nothing is done

# Eye Disease Among Americans

## Conclusion

Reversing this trend towards increasing numbers of blind and visually impaired needs to be a major focus in the coming years





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FP  
RTZ  
OPT  
IP FCVDH  
TRENMV  
UYTRMSG  
ASDWHJUO  
RTYFD  
PUTRD