



Diabetes and the Eye

Ann Albright, PhD, RD
Division of Diabetes Translation, CDC



DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION



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Ann Albright, PhD, RD

Director, Division of Diabetes Translation
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The findings and conclusions in this presentation are those of the author and do not necessarily represent the views of the CDC.

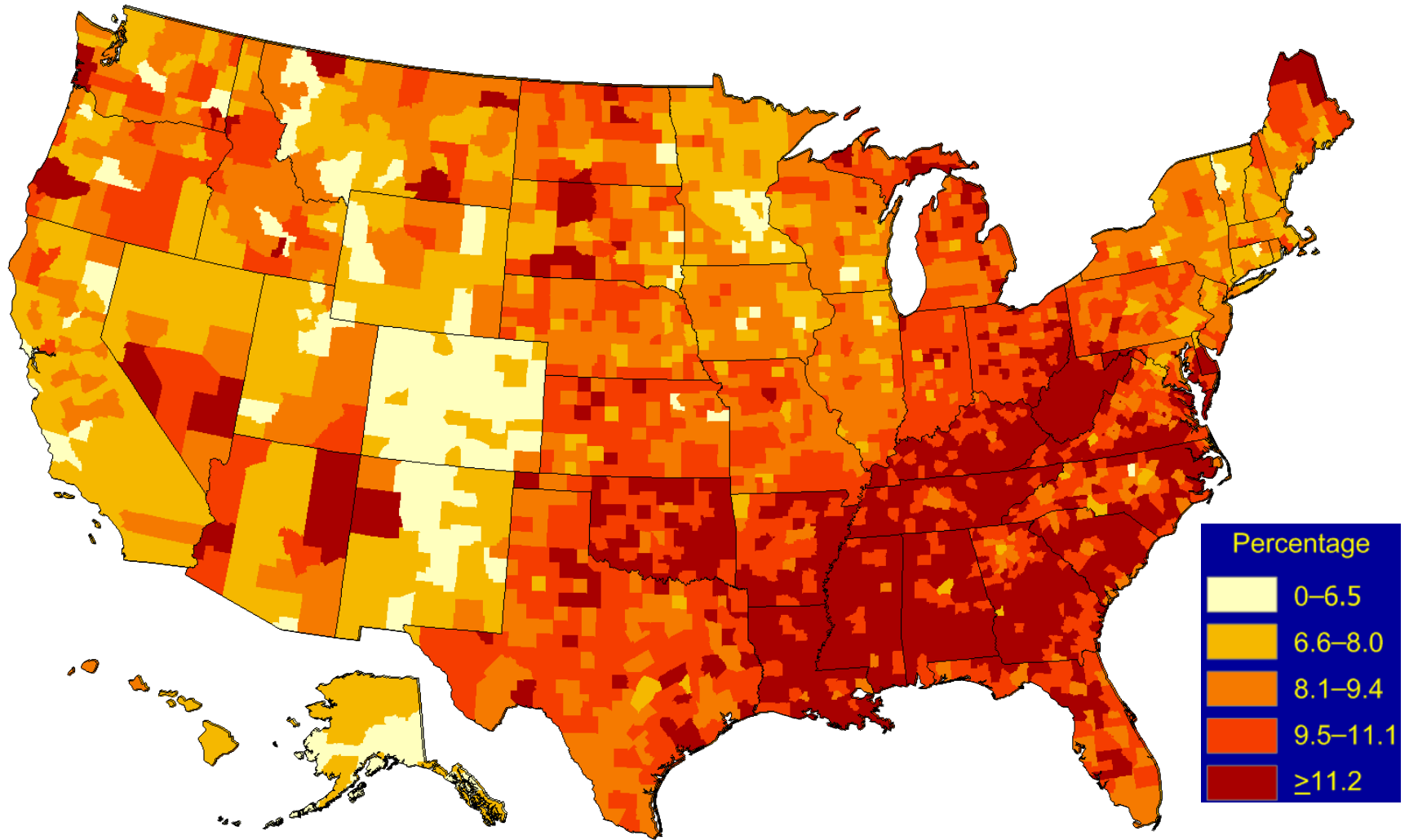
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**26 million
with Diabetes**

**79 million
with Prediabetes**

County-Level Estimates of Diagnosed Diabetes Among US Adults Aged ≥ 20 Years: 2004–2008



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1 in 3 US Adults Will Have Diabetes in 2050...

□ If current trends continue

- Americans are living longer
- People with diabetes also are living longer
- Increases in minority groups at high risk for type 2 diabetes
- New cases of diabetes

□ 1 in 10 U.S. adults have diabetes now

Boyle, Thompson, Gregg, Barker, Williamson. Population Health Metrics 2010: 8:29
(22 October 2010)

Wise Words

“Diabetes can be fairly described as a “whole life” disease in that few areas of one’s life is not either influenced by or implicated in the manifestation and control of the disease”.

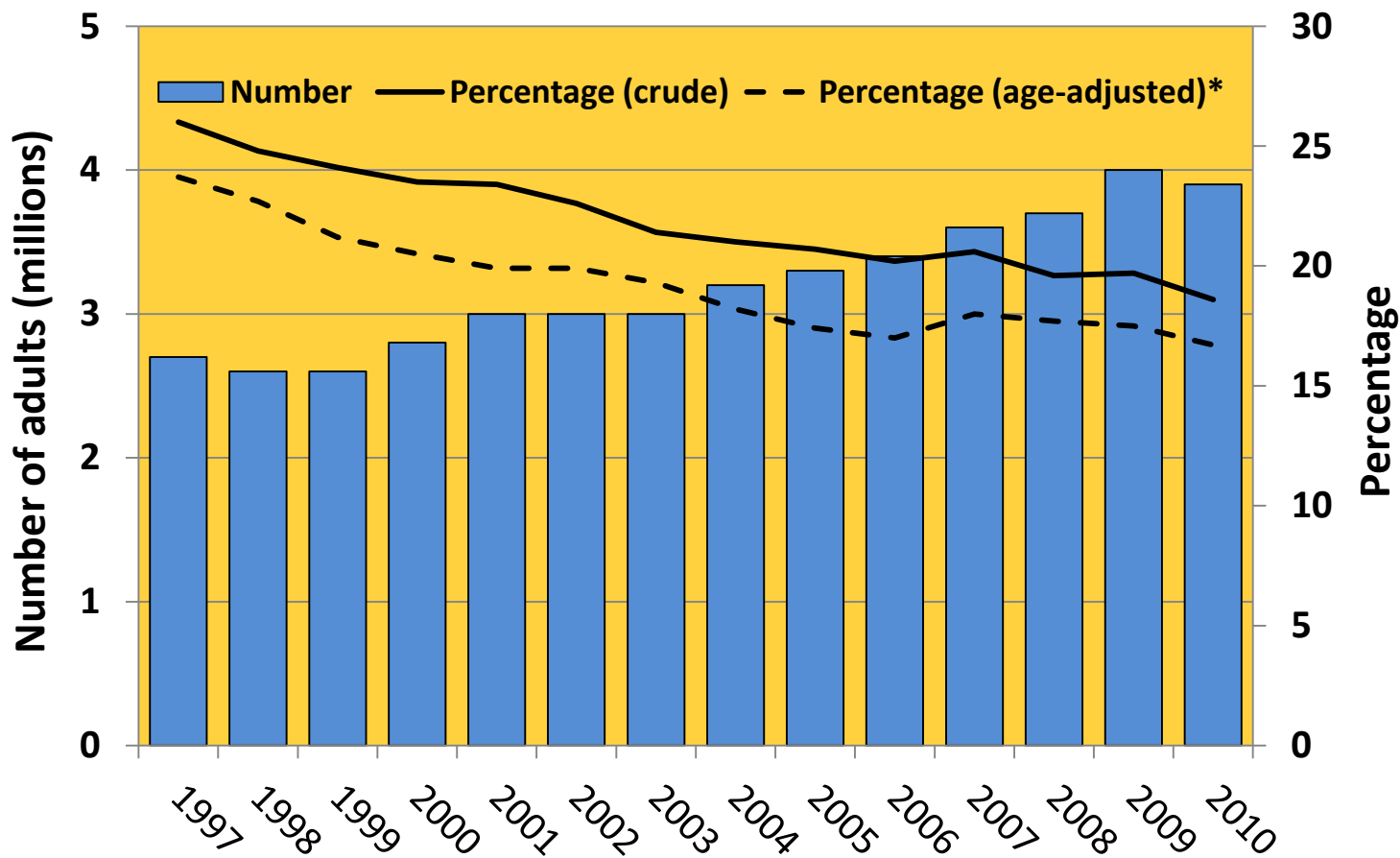
Leandris Liburd, *Diabetes and Health Disparities*

Vision Impairment and Blindness

- Diabetic retinopathy is the leading cause of new cases of legal blindness among adults aged 20–74 years in the US
- Diabetes-related blindness is a personal and societal burden and costs the nation about \$500 million annually

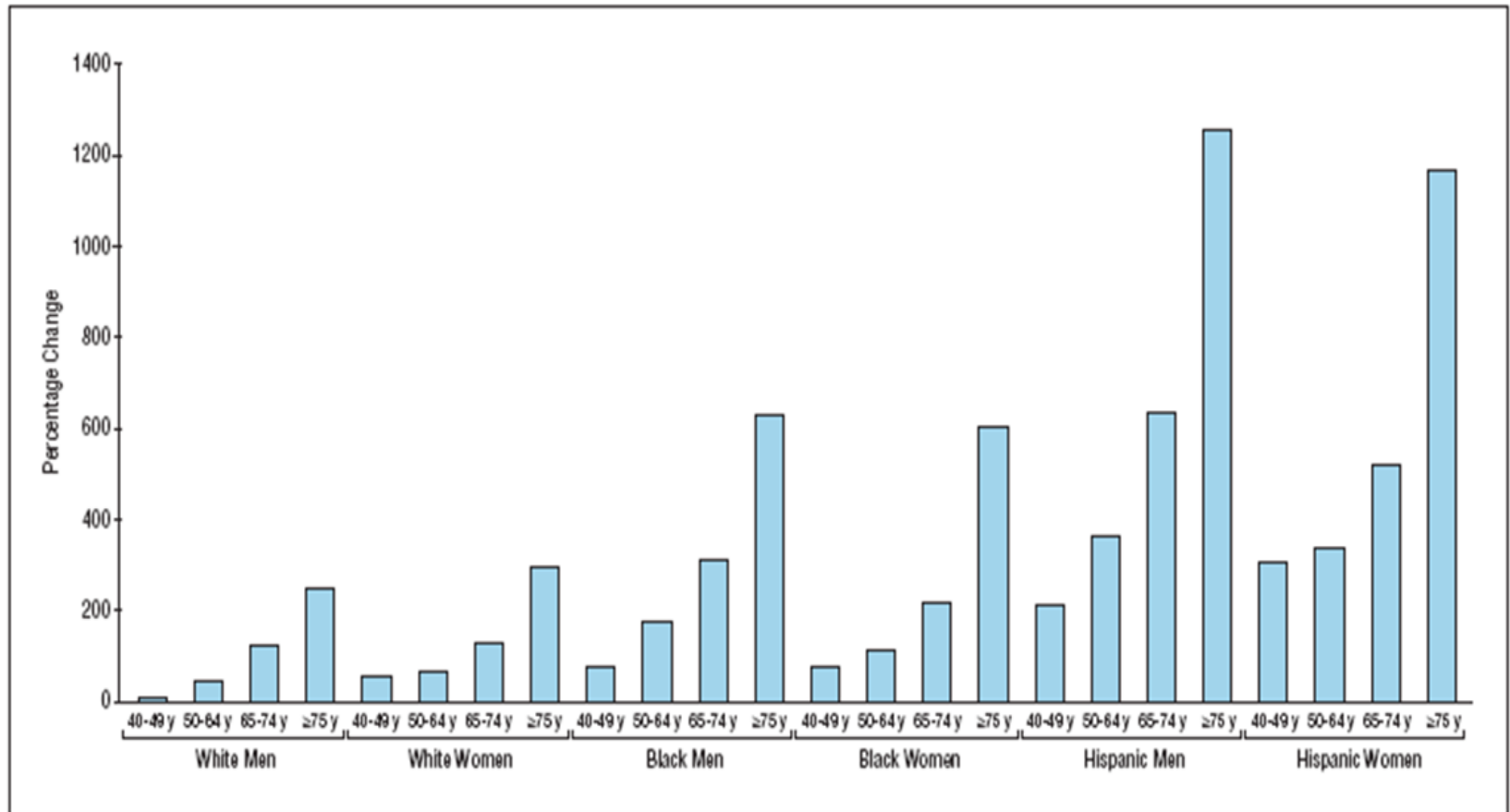
Number and percentage of adults aged ≥ 18 years with self-reported diabetes and visual impairment

National Health Interview Survey, United States, 1997–2010



*On the basis of the 2000 U.S. standard population. Source: CDC, 2012.

Projection of Diabetic Retinopathy: 2005–2050



Arch Ophthalmol Dec 2008;126(12):1740-1747

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Ocular Complications of Diabetes

- All eye structures are susceptible to the harmful effect of diabetes
- Retinal complications
 - Nonproliferative Diabetic Retinopathy
 - Proliferative Diabetic Retinopathy
 - Diabetic Macular Edema
- Other ocular findings
 - Cataract, Glaucoma

Risk Factors for Diabetic Retinopathy

- Duration of diabetes
- Severity of baseline retinopathy
- Gender, race/ethnicity
- Hyperglycemia
- High blood pressure
- Hyperlipidemia

Progress in Control: Diabetes Outcomes

- Vision Loss (1997–2009) ↓ 26%
- Amputation (1995–2009) ↓ 52%
- End Stage Renal Disease(1995–2008) ↓ 34%
- CVD Hospitalization (1997–2009) ↓ 10%
- Total Hospitalization (1995–2009) ↓ 41%

www.cdc.gov/diabetes

Health Disparity and Diabetic Retinopathy

	NHANES III		NHANES 2005-2008	
	%	95%CI	%	95%CI
Non-Hispanic white	1.9	(1.3-2.6)	3.2	(2.5-4.2)
Non-Hispanic black	4.9	(3.9-6.0)	8.7	(6.6-11.5)
Mexican American	6.8	(4.6-10.0)	5.0	(3.1-7.8)
P, White vs. Black		<0.001		<0.001
P, White vs. Mexican		0.001		0.136
P, Black vs. Mexican		0.170		0.068
<HIGH SCHOOL	2.8	(2.2-3.6)	6.9	(5.1-9.2)
HIGH SCHOOL	3.0	(2.0-4.4)	3.5	(2.3-5.2)
>HIGH SCHOOL	1.1	(0.6-2.0)	2.7	(2.1-3.6)
p, <HS vs. >HS		0.001		0.001
PIR <1.00	2.4	(1.6-3.5)	5.1	(3.4-7.8)
1.00-1.99	2.6	(1.7-3.8)	4.8	(3.3-6.9)
2.00-3.99	2.2	(1.3-3.6)	3.8	(2.5-5.7)
>=4.00	1.9	(1.1-3.2)	2.2	(1.4-3.5)
PIR<1.00 vs. >=4.00		0.405		0.030

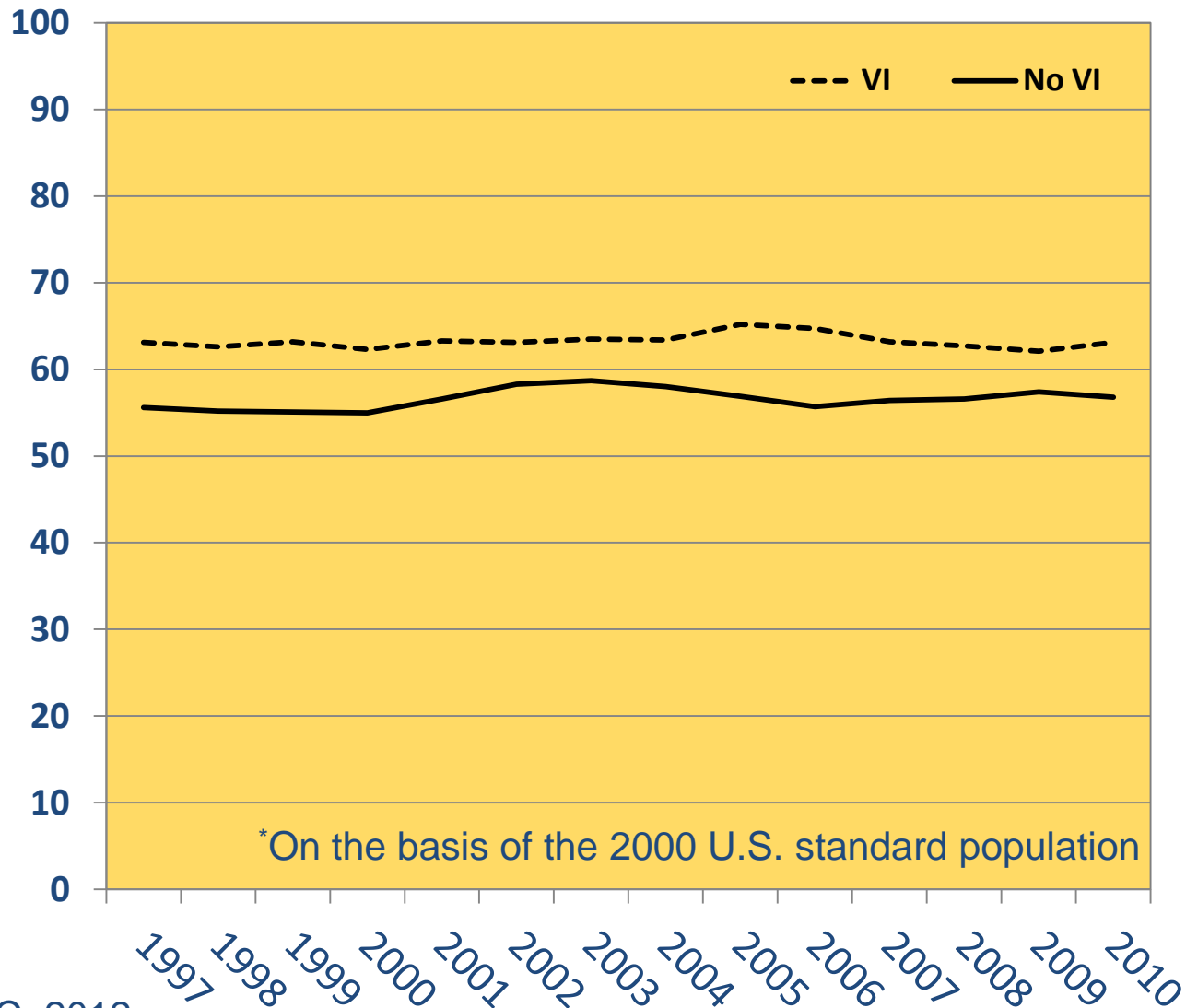
We've got a ways to go!

- Diabetes care remains suboptimal
- Risk factors for complications are too prevalent
- Rates of complications and death are too high
- Increasing incidence of diabetes
- Disadvantaged populations continue to be disproportionately affected

Treatment of Diabetic Retinopathy

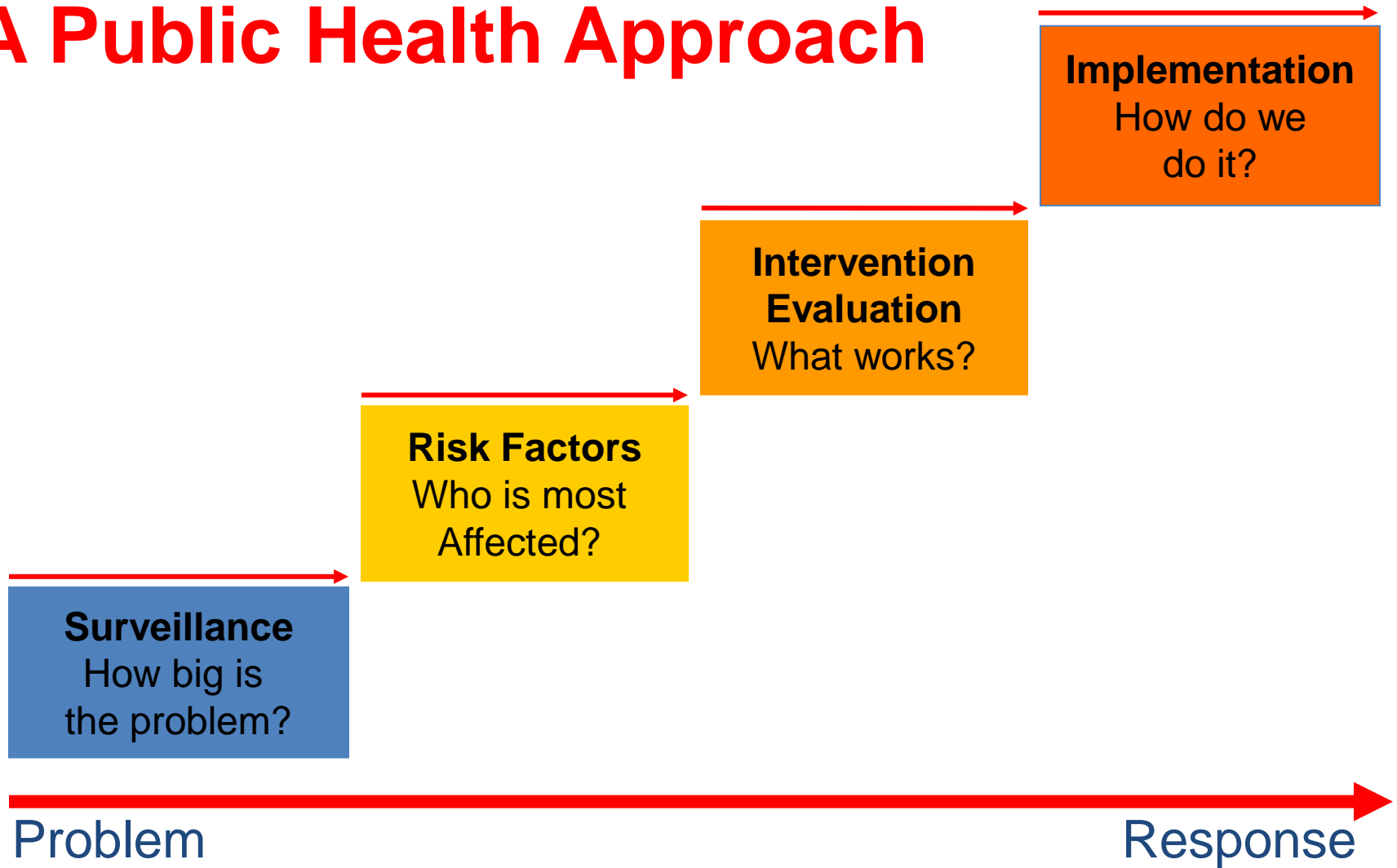
- Primary prevention:
 - Glycemic, hypertension, and lipids control
- Secondary: surgical treatment.
 - Laser photocoagulation, vitrectomy
- Rehabilitation:
 - Low-vision aids, devices for insulin administration, etc.

Age-adjusted* percentage of adults aged ≥ 18 years with self-reported diabetes who reported annual contact with an eye care provider, by visual impairment (VI) status: National Health Interview Survey, United States, 1997–2010



Source: CDC, 2012

A Public Health Approach



Summary of Public Health Interventions

- Surveillance
 - NHANES
 - BRFSS
 - SEARCH for Diabetes in Youth
- Health economics
 - Cost of DR and cost-effectiveness model
- Insight – Network study on screening for DR
- Programs/integration in state health depts

Vision

A world free of the **devastation** of diabetes



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Blindness
.America**
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FP
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