

Type 2 Diabetes in Massachusetts: A Population Perspective and its Implications for Public Policy

Barbara Goldoftas, Ph.D.

Clark University

bgoldoftas@clarku.edu

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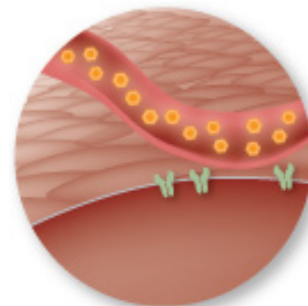
March 26, 2014

Overview

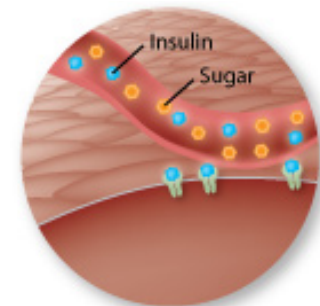
- Overview of the problem
- Complex causation
- Evidence from cross-cultural studies
- Lessons for management and prevention
- What can Massachusetts do?

What is Diabetes Mellitus?

- Type 1
 - Juvenile onset
 - Autoimmune disorder
 - No insulin produced
- Type 2
 - 90-95% cases
 - Formerly “adult onset”
 - Insulin less effective
- Gestational (pregnancy)



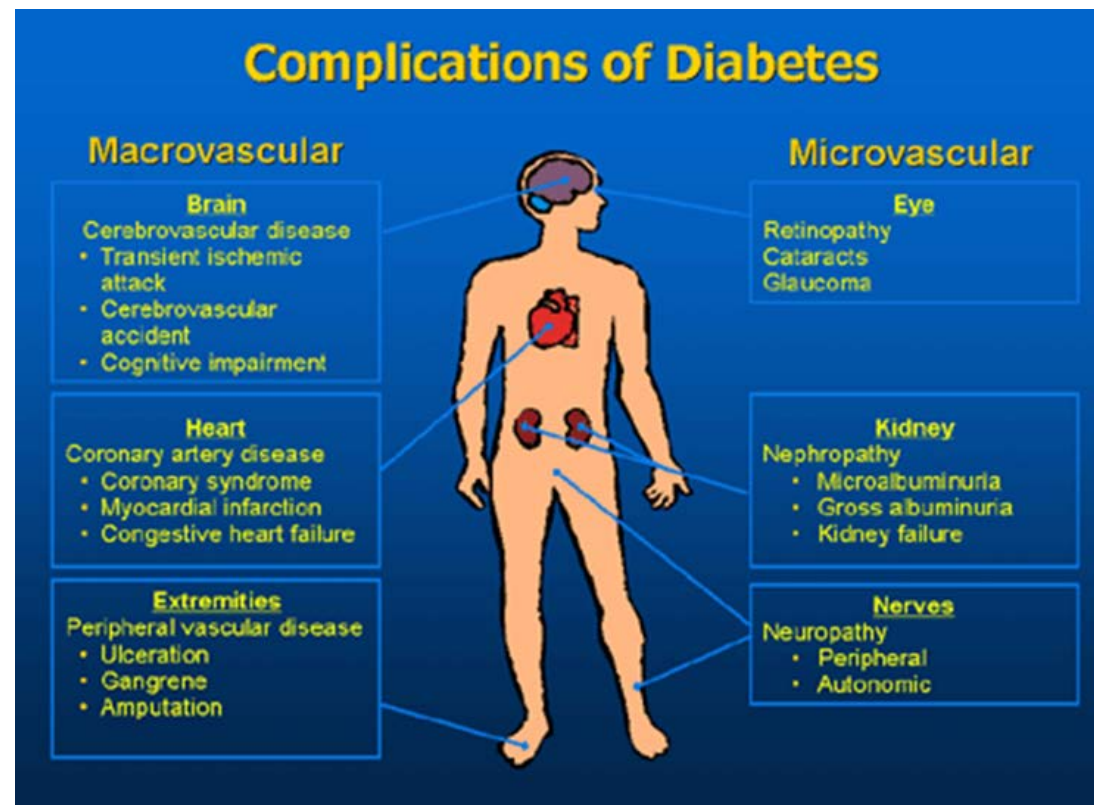
Type I Diabetes
No insulin signal



Type II Diabetes
No response

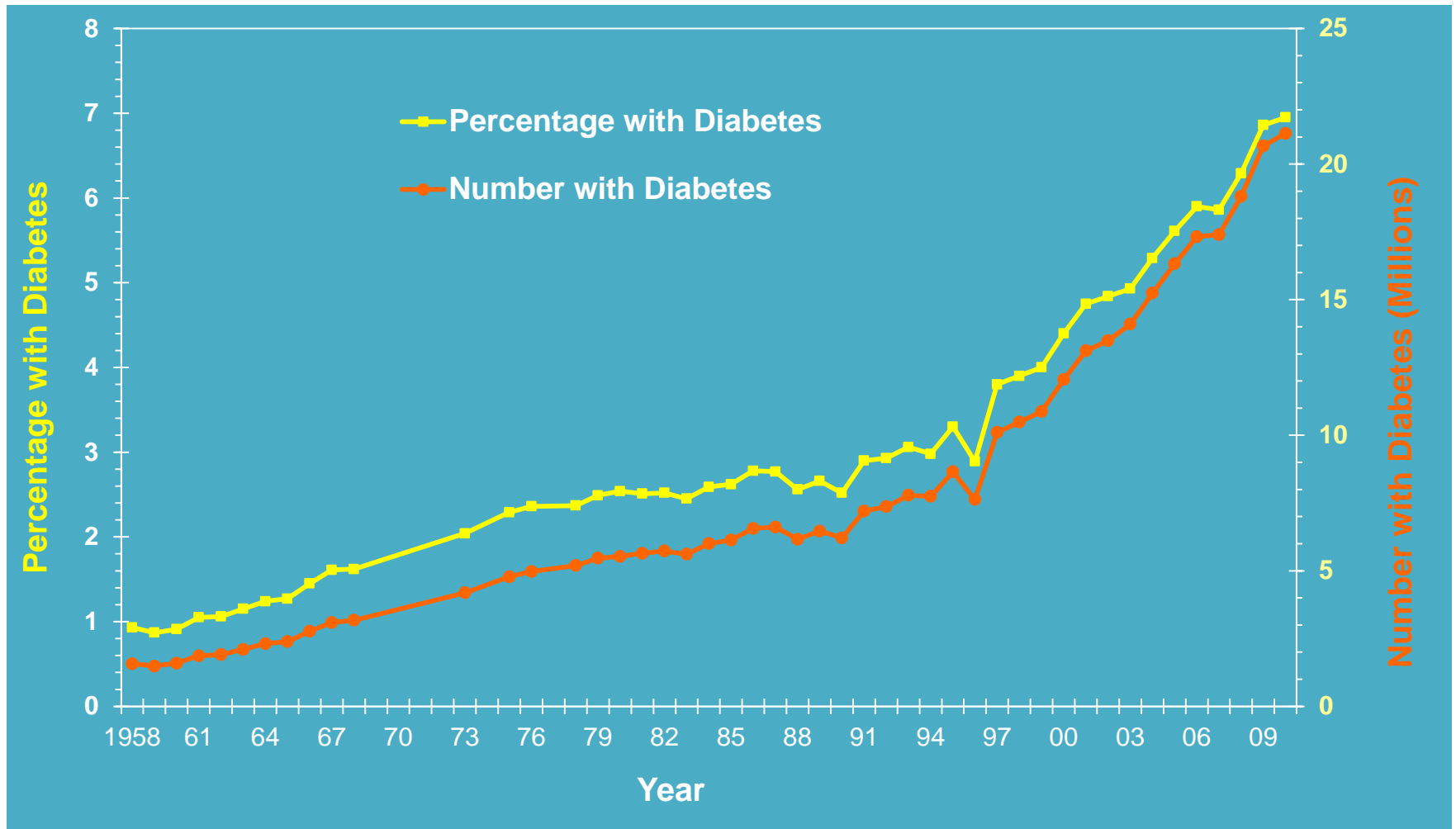
Type 2 diabetes: long-term complications

- Prolonged high blood sugar
- Multiple long-term complications
- “It’s a terrible disease. It can damage every organ in your body.”



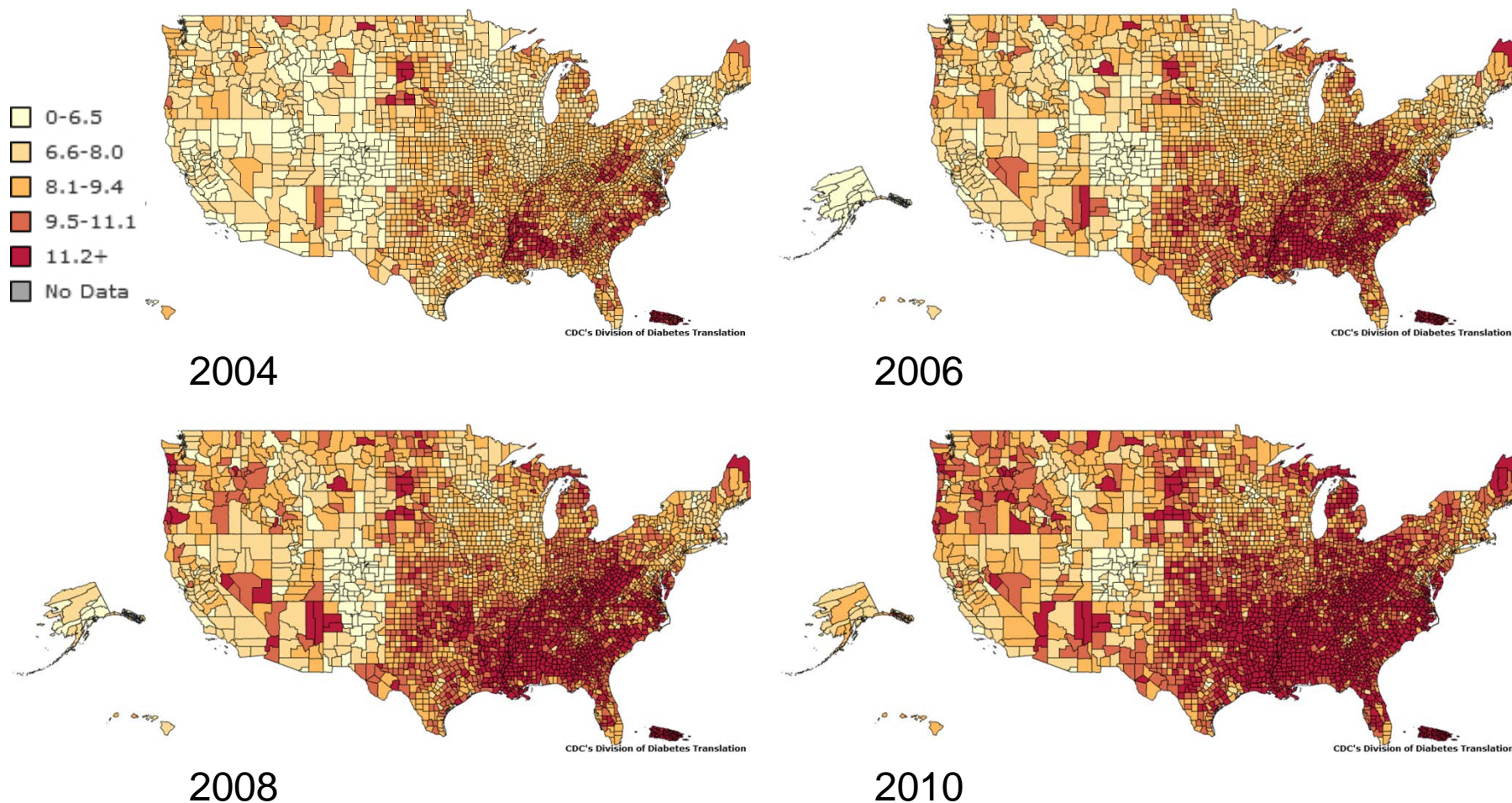
Source: <http://www.medscape.org/viewarticle/551056>

Number and percentage of US population with diagnosed diabetes, 1958-2010



Source: CDC's Division of Diabetes Translation. National Diabetes Surveillance System. <http://www.cdc.gov/diabetes/statistics>

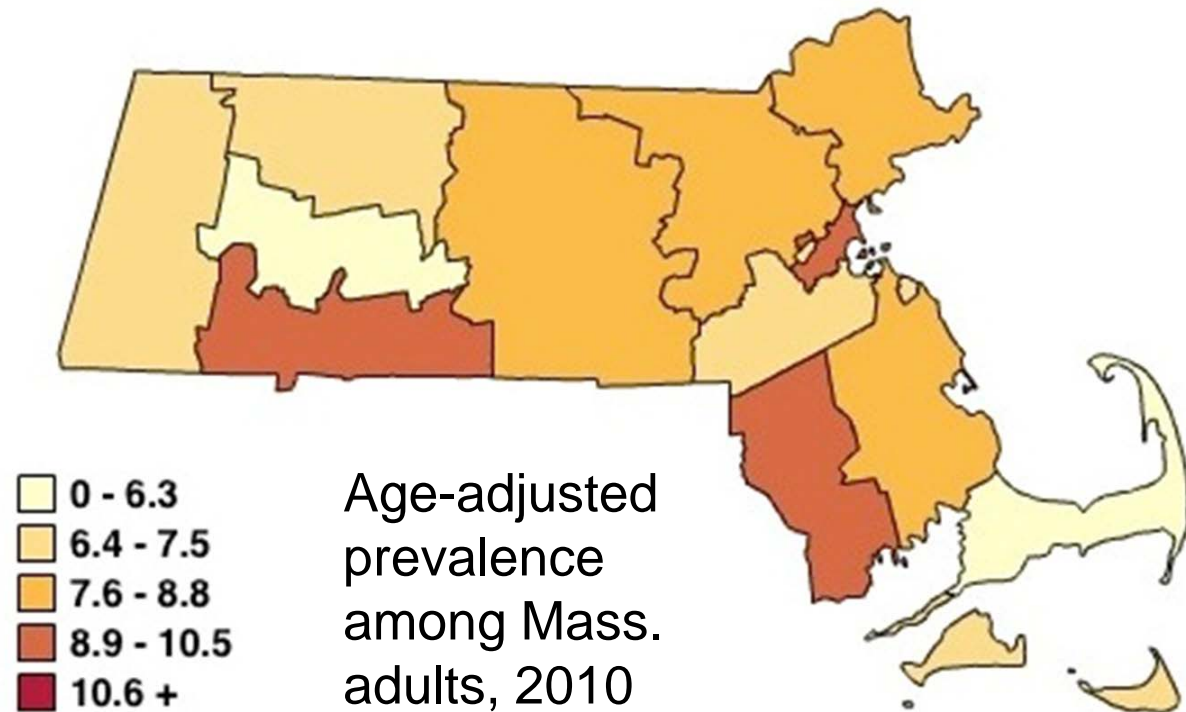
Diagnosed diabetes by county, 2004-2010



Source: CDC, <http://www.cdc.gov/diabetes/atlas/countydata/atlas.html>

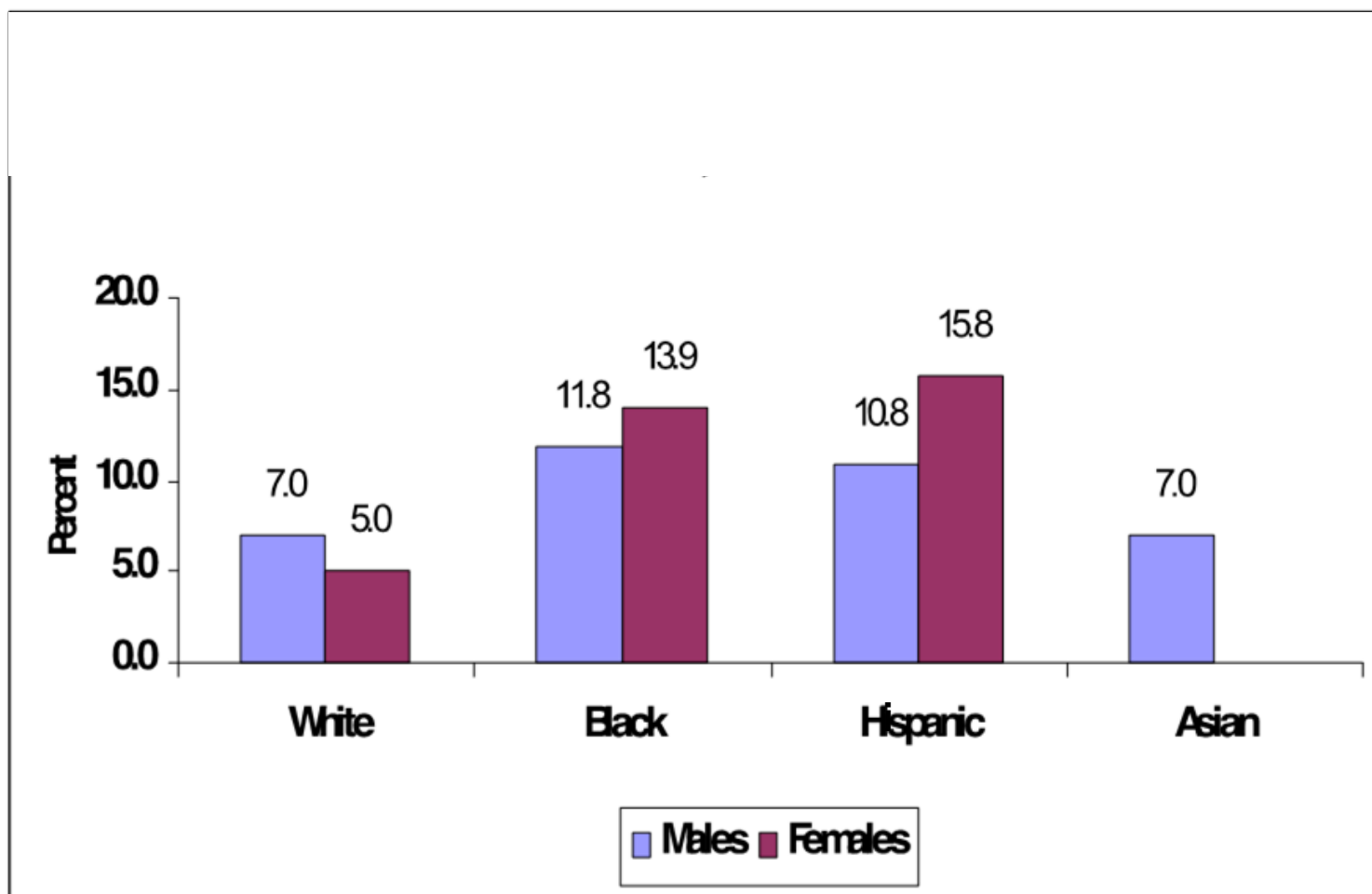
Type 2 diabetes in Massachusetts

- Doubling of number of diabetics
- Huge disparities:
 - Race/ethnic group
 - Education/income
 - Gender

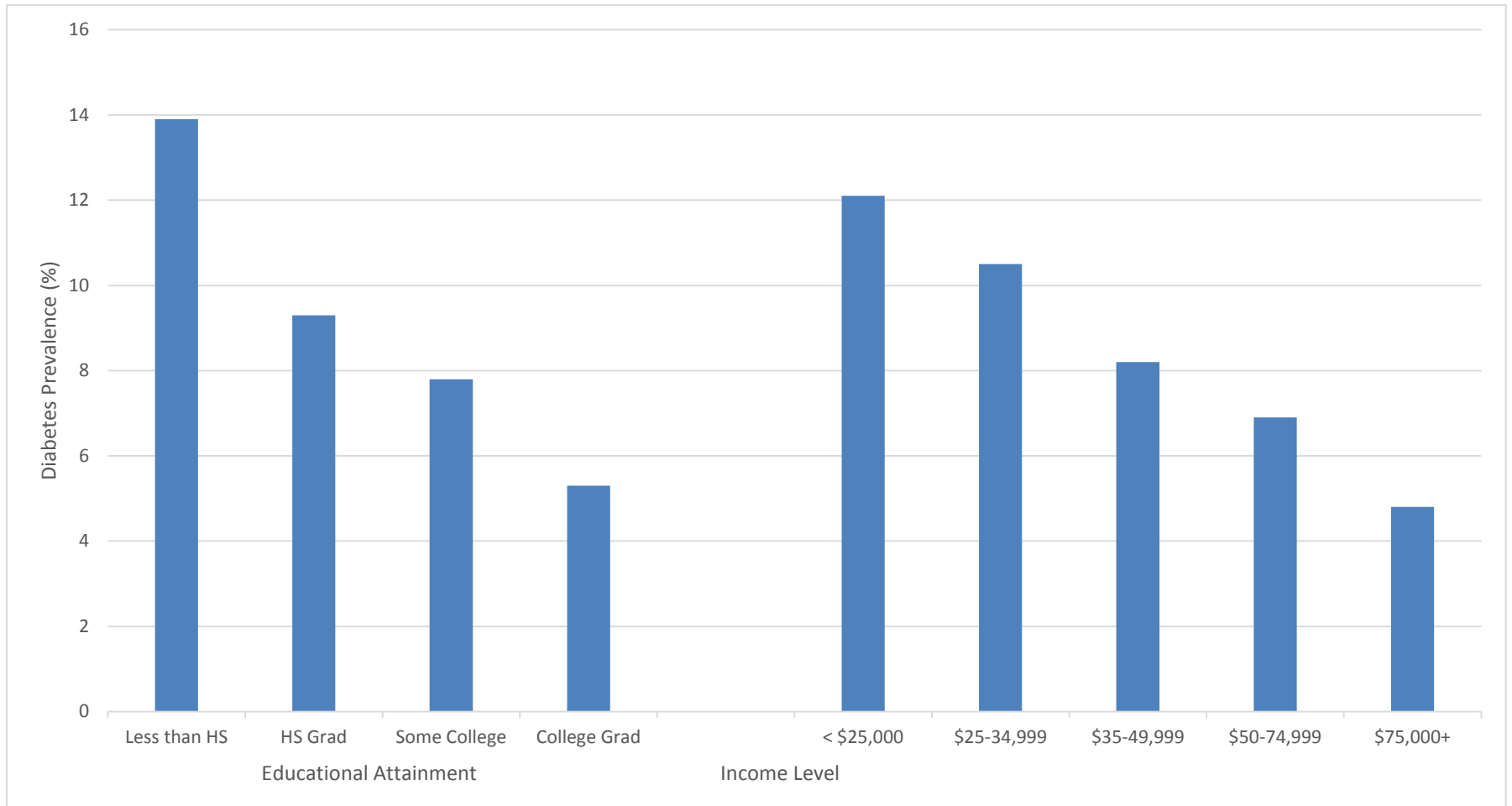


Source: Centers for Disease Control and Prevention, 2010.

Prevalence (%) of diabetes by race/ethnic group and gender, 2006-2008



Diabetes prevalence (%) by education and income, 2011



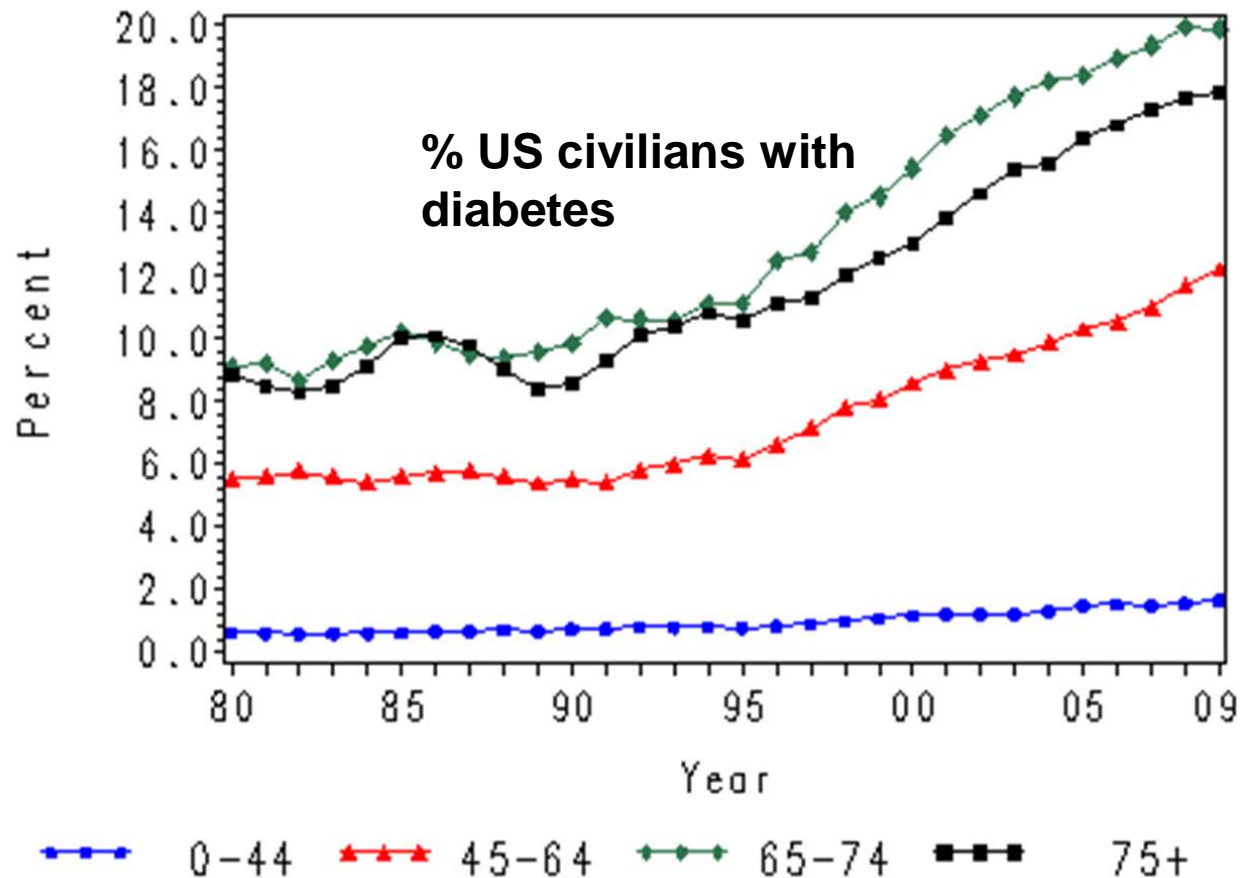
Source: Massachusetts Department of Public Health, 2013

Type 2 diabetes is costly

- Average annual health-care costs of diabetic ~ five times that of non-diabetic
- Overall economic costs of diabetes in the US: est. \$245 billion in 2012, direct and indirect expenses, including:
- Direct medical costs: \$176 billion
 - Hospital inpatient care: 43%
 - Prescription drugs (treatment of complications): 18%
 - Medication and supplies (blood sugar management): 12%
- Lost productivity: \$69 billion

Causation of type 2 diabetes is complex

- What has caused these metabolic changes?
- Why *now*?



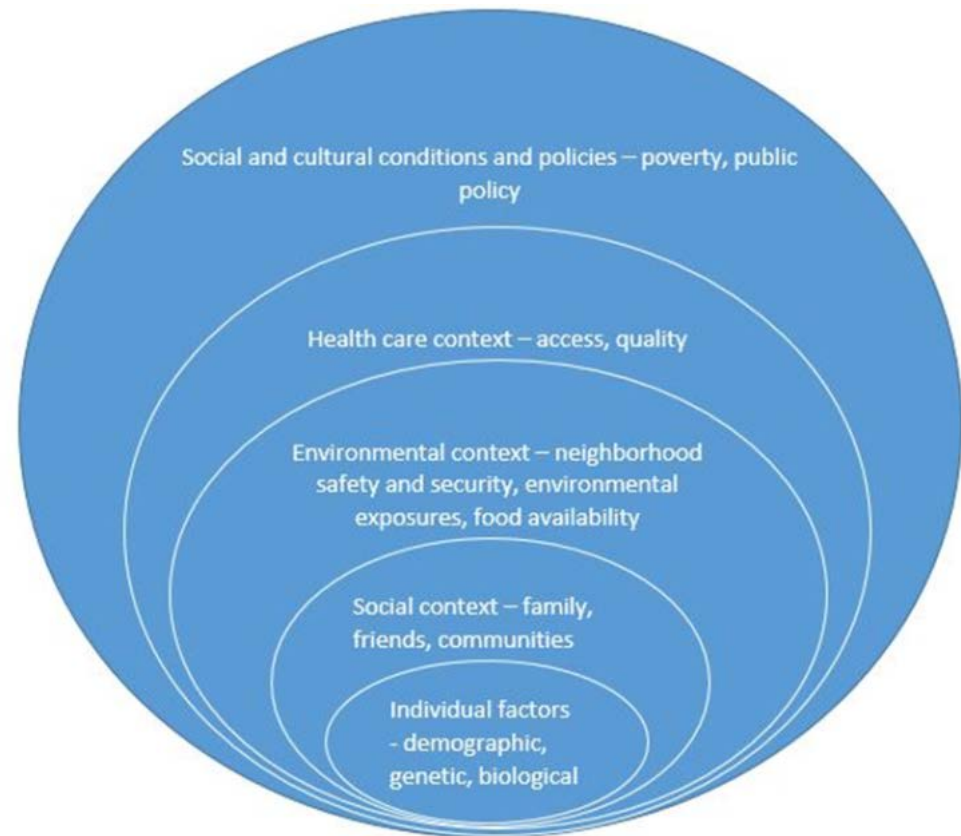
Medical model: focus on individuals

- Individual “lifestyle” behaviors and risk factors
 - Poor nutrition
 - Inactivity
 - Overweight and obesity
- Genetics?



Population perspective: focus on environmental and social conditions

- Biologic and health behaviors are influenced by:
 - Socioeconomic status
 - Family and race/ethnic group
 - Local environmental conditions
 - Access to health care
 - Social conditions, culture, social policies



Population perspective: recent research

- Influences on behavior from local environments
 - Green space and “walkability” of neighborhoods
 - Availability of nutritious food vs. food deserts
- The role of changes in physiology
 - Safety and chronic stress—“fight-or-flight” response
 - Environmental exposures
 - Persistent organic pollutants (PCBs, pesticides, dioxin)
 - Arsenic
 - Air pollution—particulates
 - Exposures that change gut ecology (antibiotics, diet)
- The possibility of interactions among these factors?

Evidence from local and global studies

Two communities with high risk of type 2 diabetes:

- Worcester: Vietnamese-American community
 - More than 50% Asian population in Worcester
 - Research by Thuha Le, Clark University, former director of Southeast Asian Coalition
- Estelí, Nicaragua: rural towns and villages
 - Type 2 diabetes is leading cause of illness and death
 - Research conducted by local organization, ASDENIC, in coordination with the Ministry of Health of Nicaragua
 - Qualitative data analysis by Stella Doughty, Clark University

Evidence from Worcester and Nicaragua

- “We have to teach our children about our disease. Our families need to understand that this is a dangerous disease. ... You could get a stroke, you could lose your sight, you could end up like a piece of old fabric that can’t think.”
- “It is true that we have to live with it, but is also true that we need to learn *how* to live with it.”

-- 64-year-old woman, Nicaragua

- “In the beginning, I didn’t pay attention. I didn’t think it was that important. If [my blood sugar] was too high, I took more medication than normal.”

-- 49-year-old male, Worcester

Evidence from Worcester and Nicaragua

- Incomplete knowledge about type 2 diabetes and its management—before diagnosis *and after*.
- Needed information hard to get from health-care system.
- Worcester: little culturally appropriate care or information targeting Vietnamese community.
 - “Eat less rice.”
- Resignation and fatalism

Lessons from Worcester and Nicaragua

- Need to focus on management and prevention:
 - Health is much more than health care.
 - Neighborhoods, homes, schools, workplaces all affect risk of type 2 diabetes (and other chronic diseases).
- Dietary advice should be culturally appropriate
- Interventions should include families and communities—which would also help with prevention:
 - Stigma and isolation: “Eating alone.”
 - “The best way to support the diabetic is to eat what they eat.”
 - “This is a family problem.”

What can Massachusetts do?

State policies can help change social norms about diet, physical activity, and chronic disease management. These might include:

- Public education, especially in at-risk communities, and including for youth
- Increased access to health care for diabetics
- Programs that support access to nutritious food and physical activity
- Culturally appropriate programs
- Development of reporting system to help assess environmental and social factors

For more information:

- Barbara Goldoftas
- Environmental Science & Policy Program
- Clark University
- bgoldoftas@clarku.edu
- 508 421 3824