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

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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 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.”

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

Diagnosed diabetes by county, 2004-2010

Type 2 diabetes in Massachusetts

- Doubling of number of diabetics

- Huge disparities:
  - Race/ethnic group
  - Education/income
  - Gender

Age-adjusted prevalence among Mass. adults, 2010

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*?

Source: www.cdc.gov/diabetes/statistics/prev/national/figbyage.htm
Medical model: focus on individuals

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

Source: http://wellergize.ca/wellness_program_topics/sedentary_living.phtml
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

Source: Stella Doughty. 2014. “Can the avalanche be stopped?” A qualitative study of type 2 diabetes in rural Nicaragua
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
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