The Healthy Cities – Diabetes Prevention Project: New insights on the built environment and obesity-related diseases

Gillian Booth MD MSc

Associate Professor of Medicine, and
Health Policy, Management and Evaluation,
University of Toronto

CENTRE FOR RESEARCH ON INNER CITY HEALTH

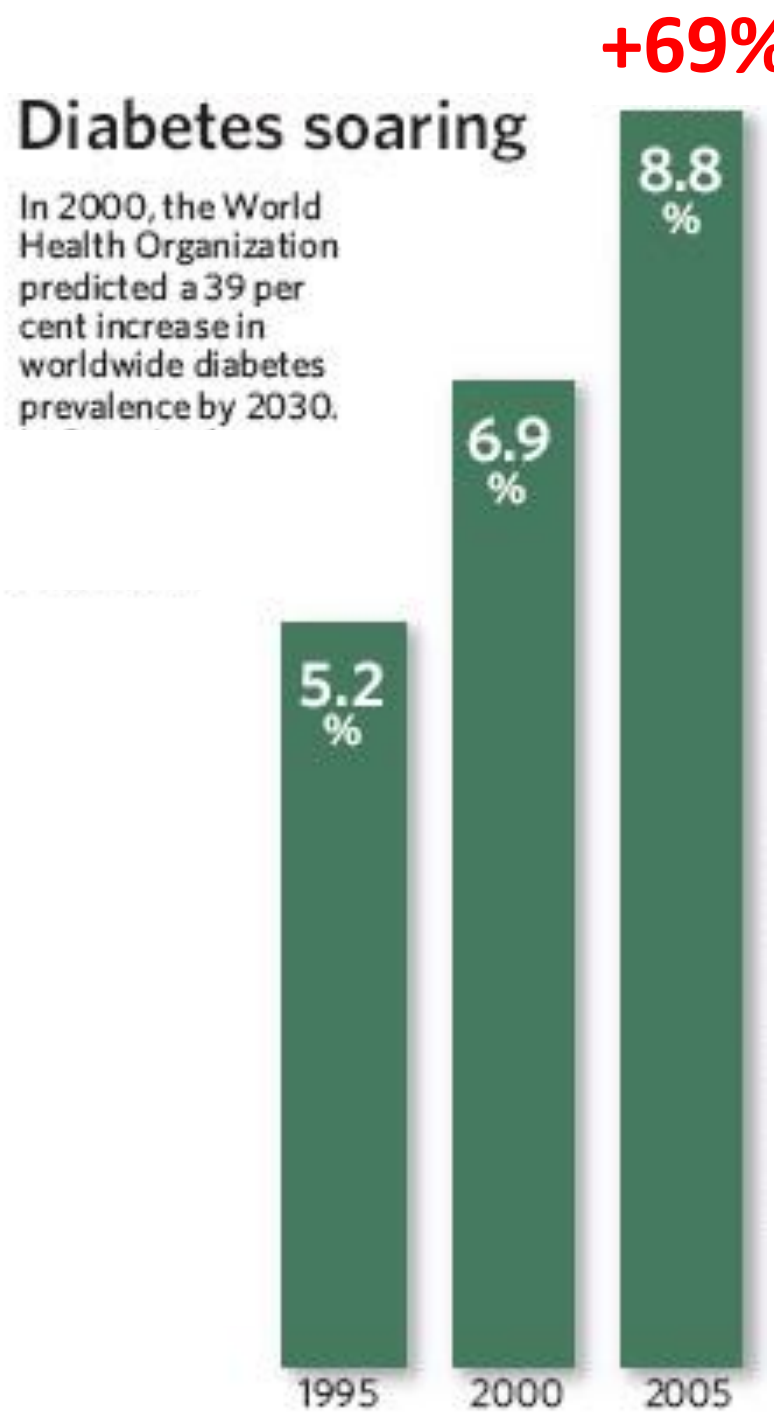
St. Michael's

Inspired Care. Inspiring Science.

ICES

Rising prevalence of diabetes

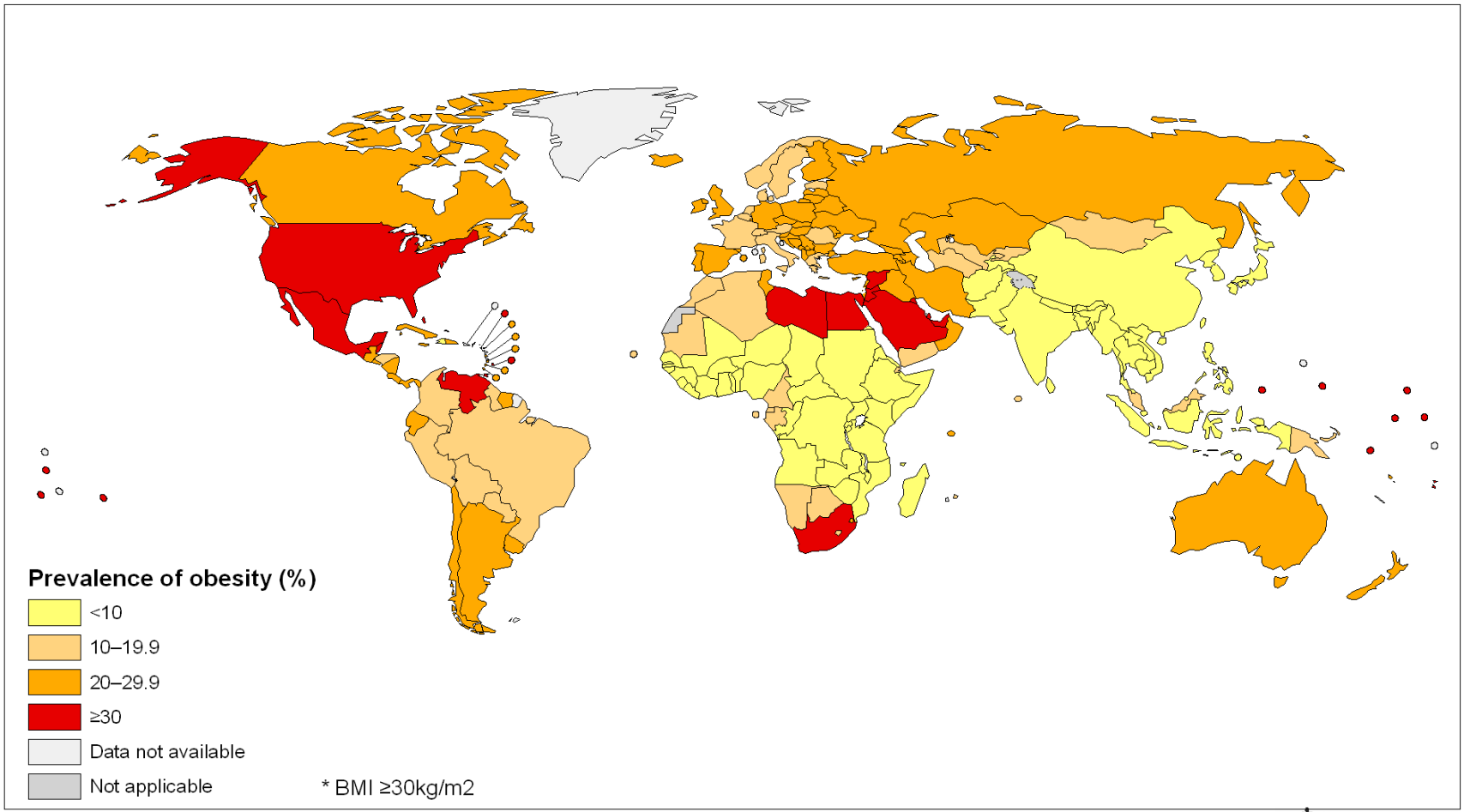
– in Canada and elsewhere



Lipscombe L and Hux J.
Lancet 2007;369:750-6

Global Prevalence of Obesity

Prevalence of obesity*, ages 20+, age standardized
Both sexes, 2008



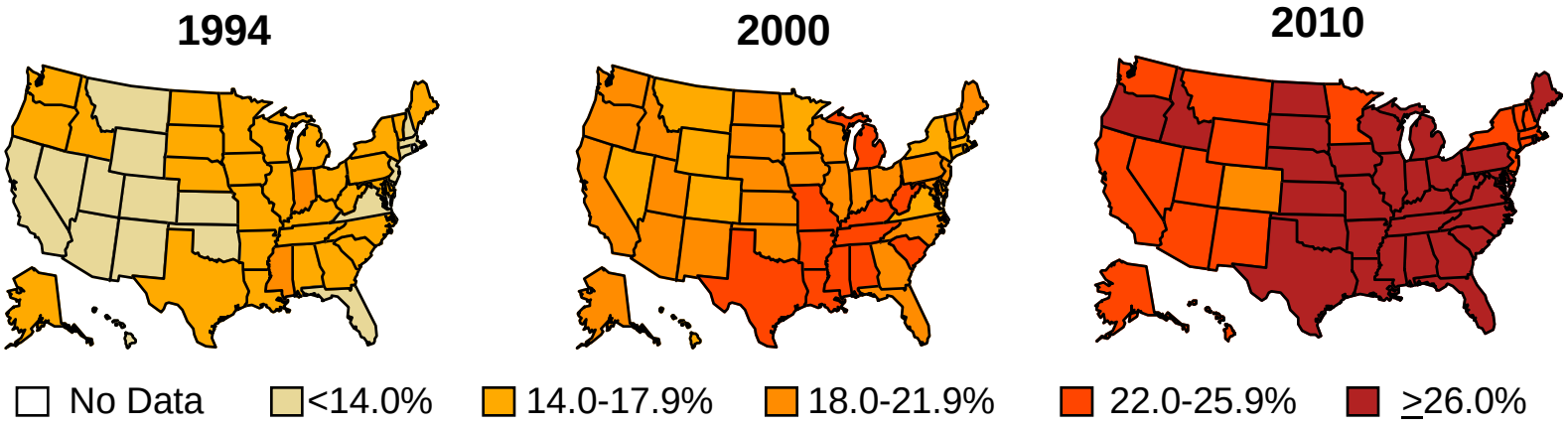
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

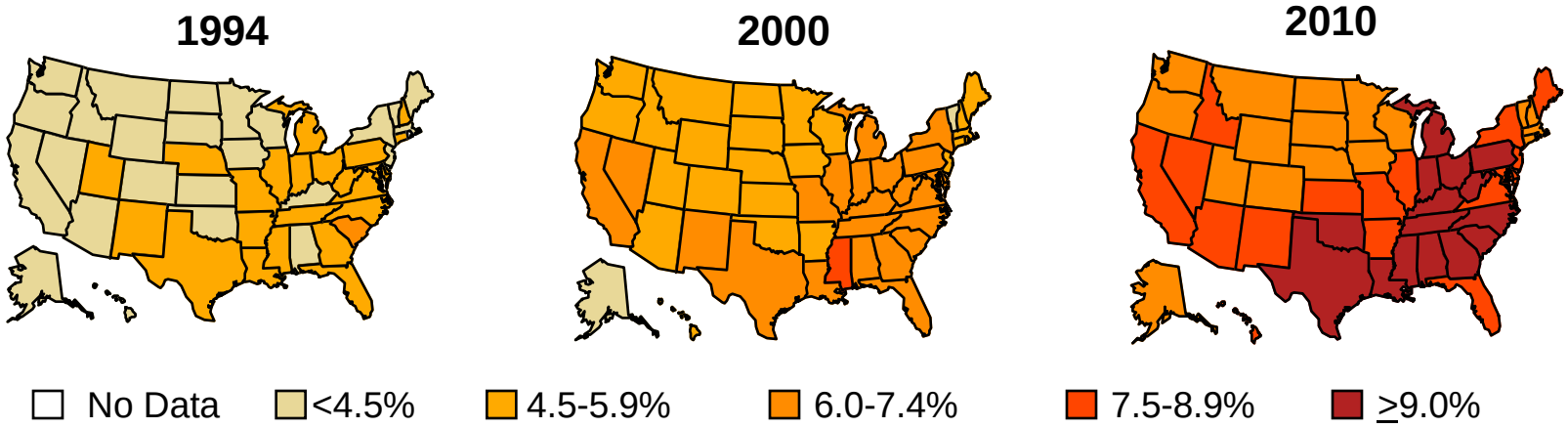
World Health Organization

Prevalence of obesity and diabetes among U.S. adults

Obesity (BMI ≥30 kg/m²)



Diabetes



CDC's Division of Diabetes Translation. National Diabetes Surveillance System
available at http://www.cdc.gov/diabetes/statistics

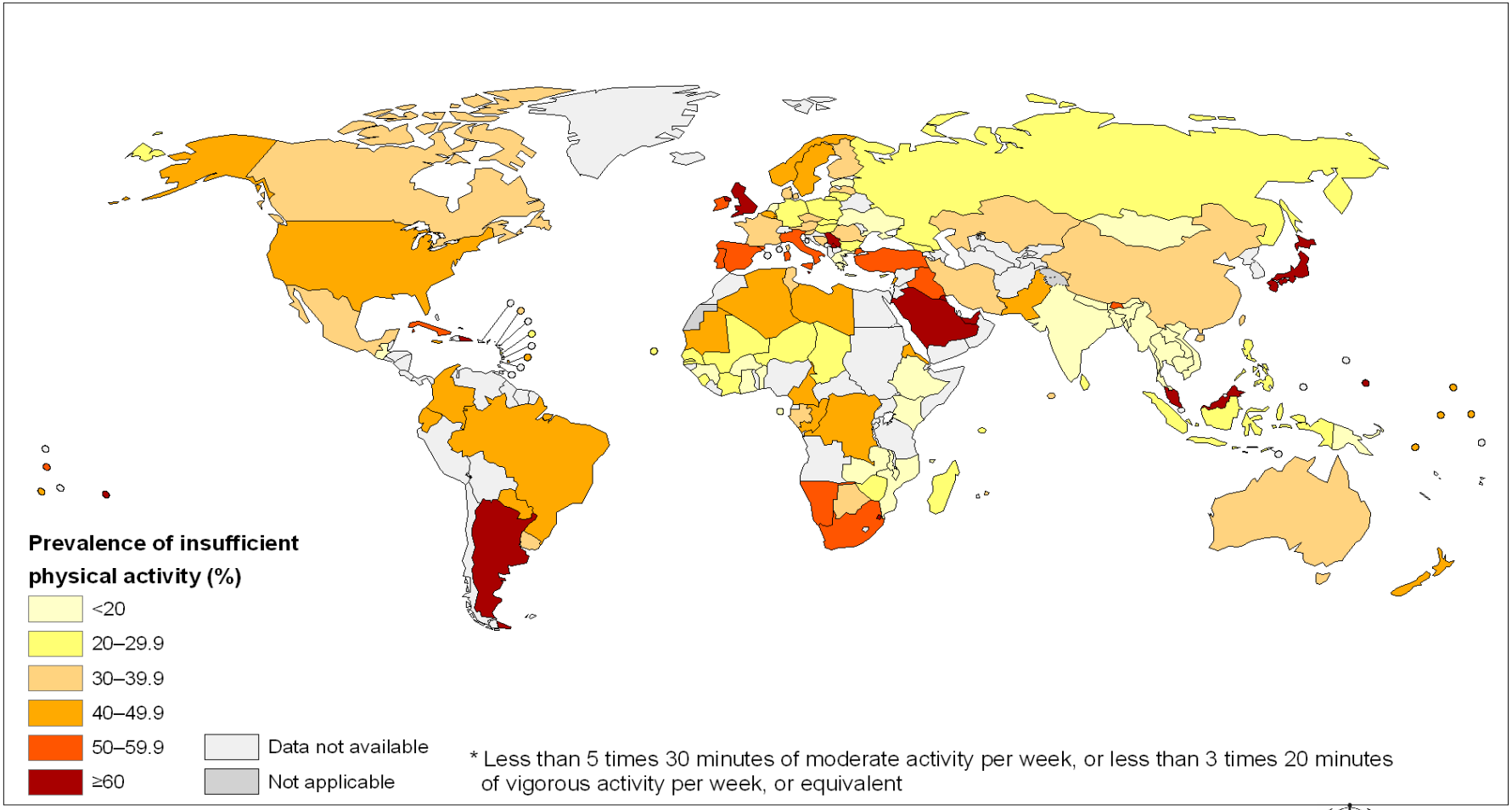
WHO estimates 350 million people worldwide with diabetes

Rapid shifts in urbanization

- –Rural to urban migration
- –Fewer opportunities for physical activity and healthy eating

Global Prevalence of Physical Inactivity

Prevalence of insufficient physical activity*, ages 15+, age standardized
Both sexes, 2008

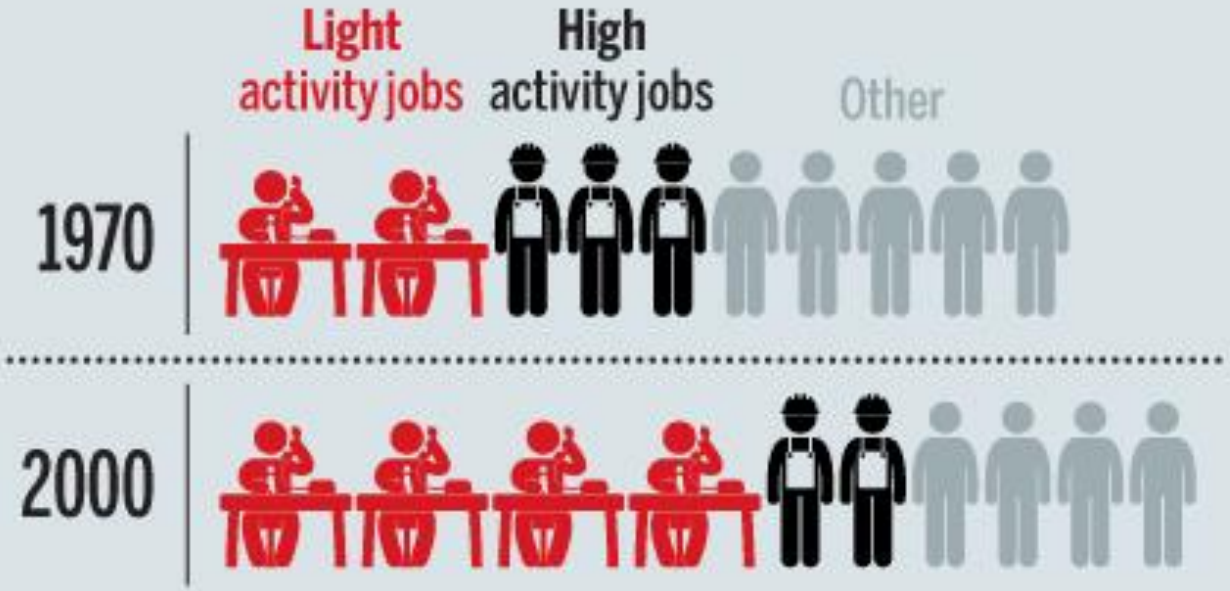


Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization

World Health Organization

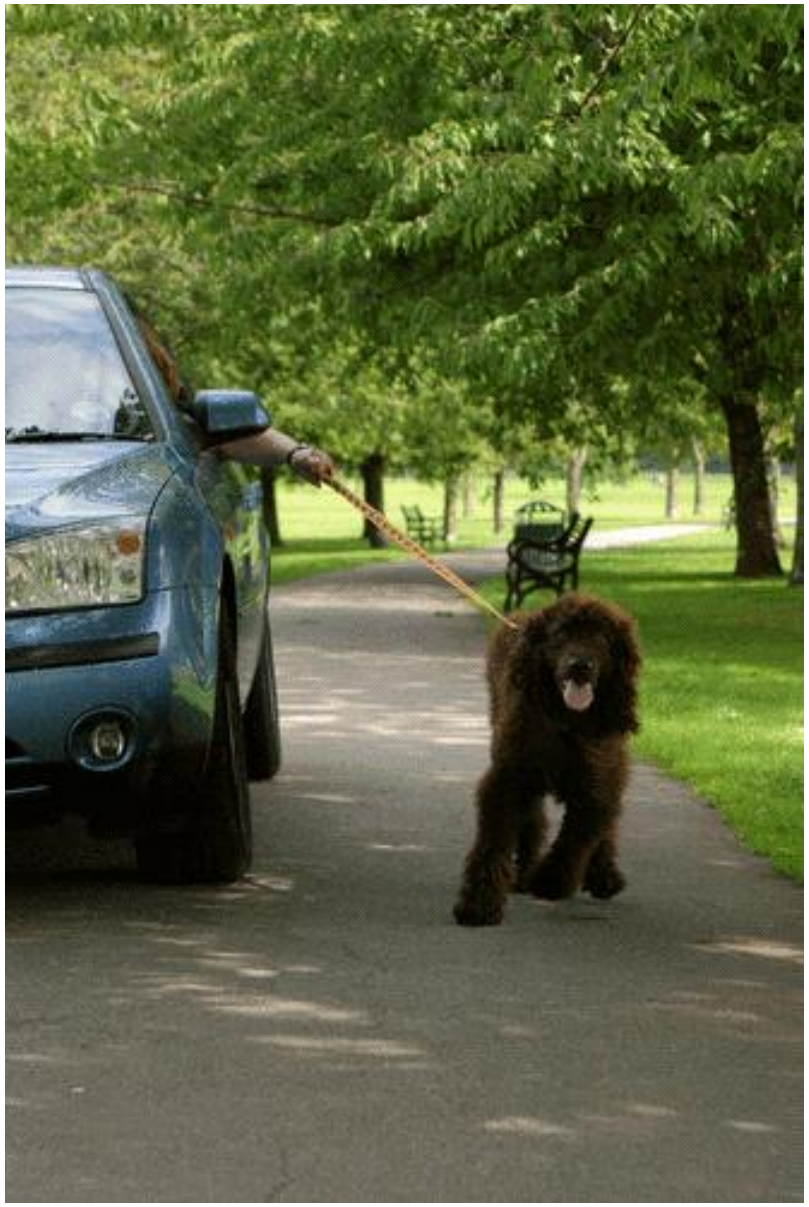
The world we sit in

As a society we spend more time sitting than we perhaps ever have, a fact revealed by a comparison of labour-market trends in 1970 and 2000



MacLeans January 8, 2013

More opportunities for sedentary choices




24 HOUR
FITNESS

Greater reliance on automobiles

The built environment as a potential target for intervention

Neighbourhood walkability, transportation behaviours and obesity

Compact Communities

Vs.

Urban sprawl

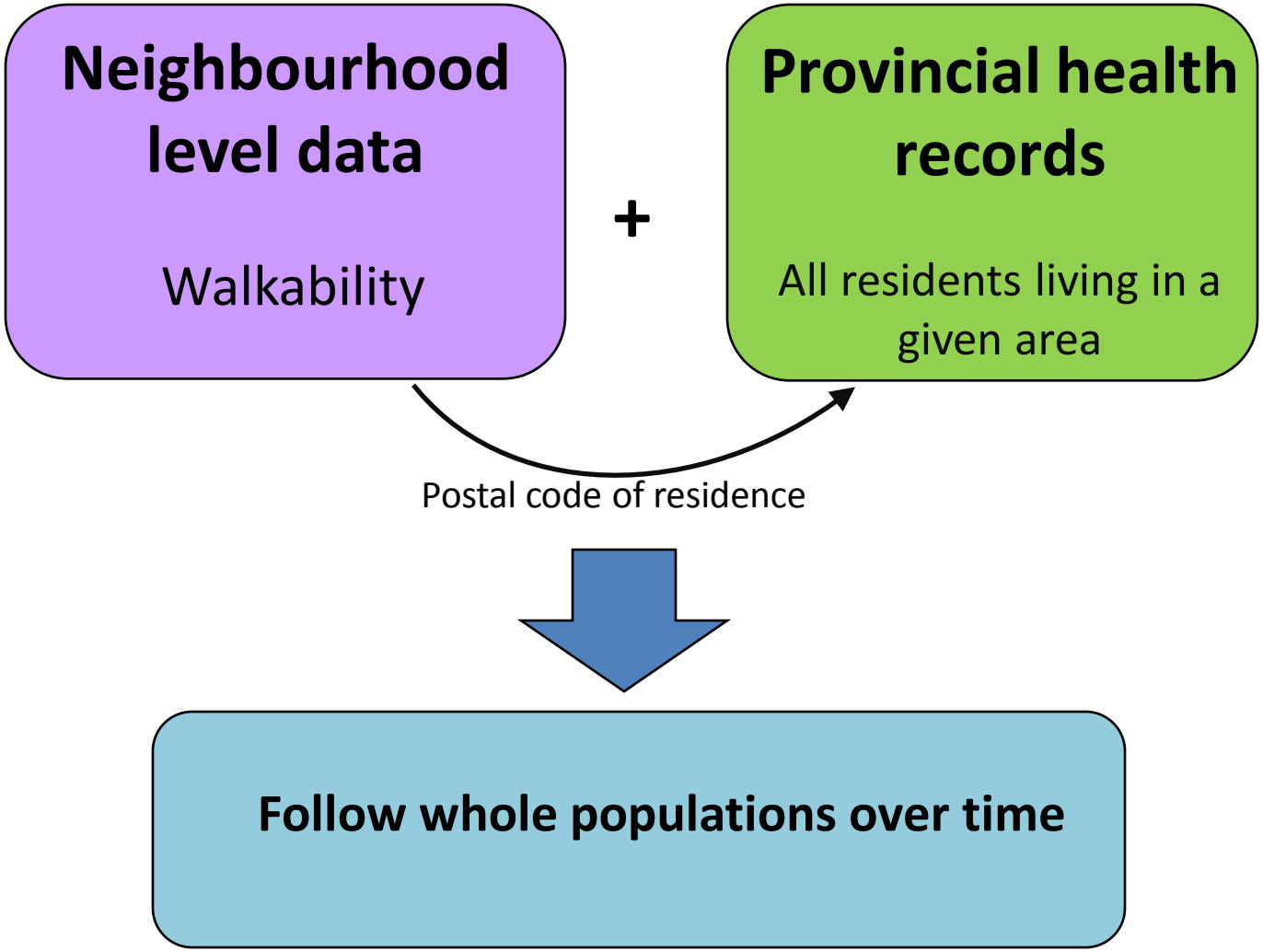
Mode of Transportation	Highest vs. Lowest Walkability*
Walk or bicycle to work	300% ⬆
Public transit to work	172% ⬆
Drive to work	43% ⬇
Obesity	25% ⬇

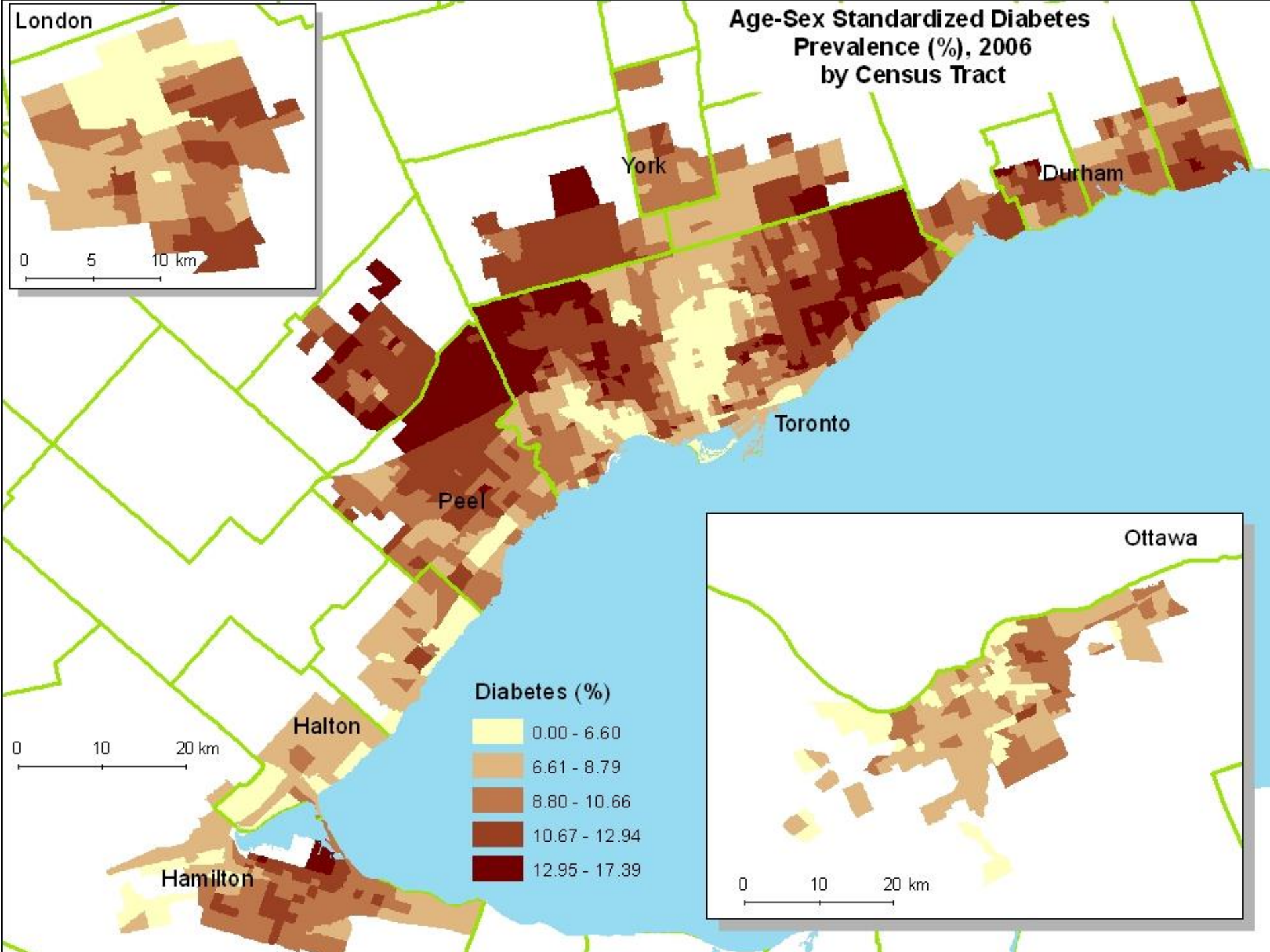
Glazier et al. PLoS one 2014

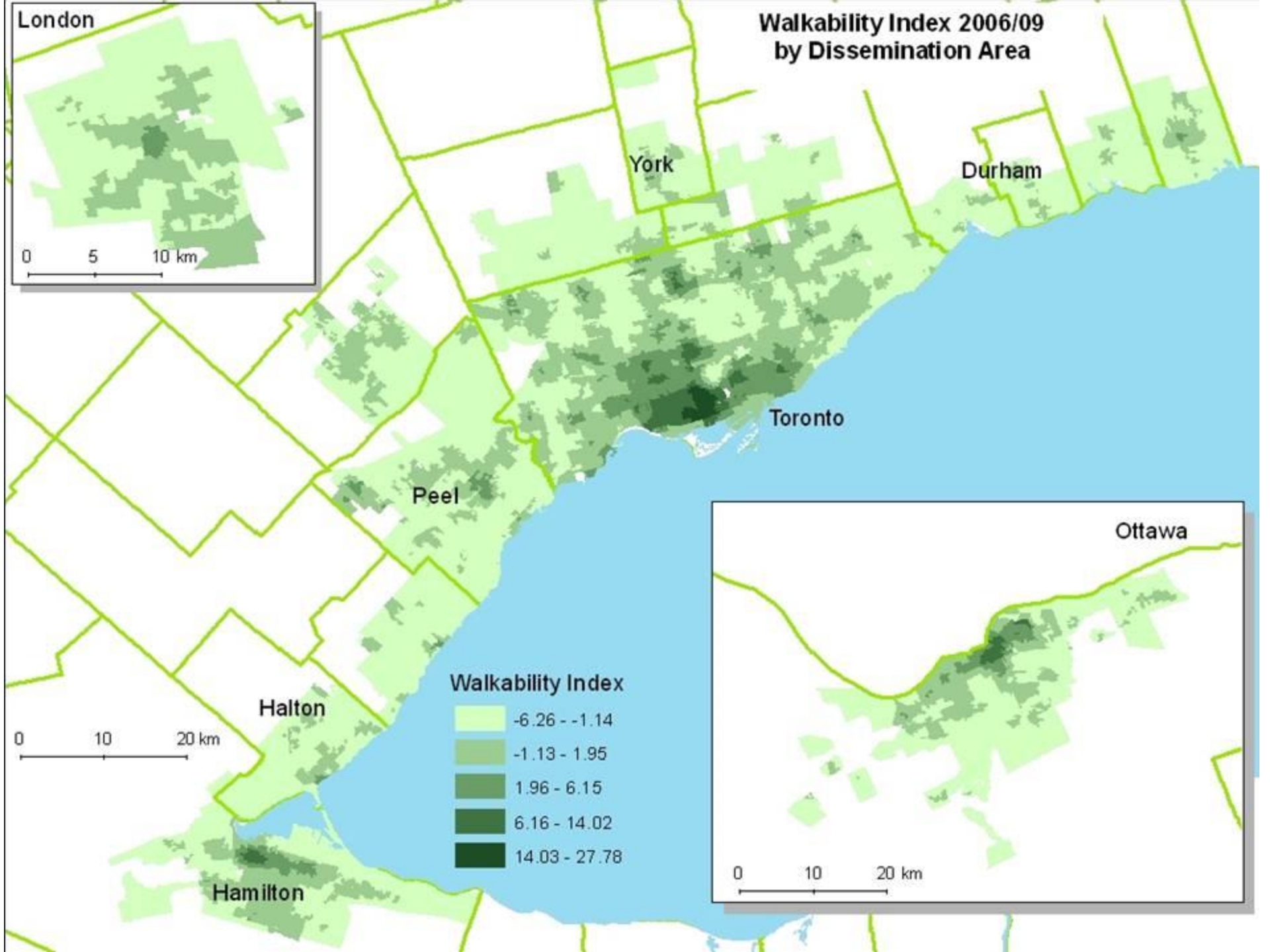
* Quintiles


Does area walkability predict
the development of diabetes?

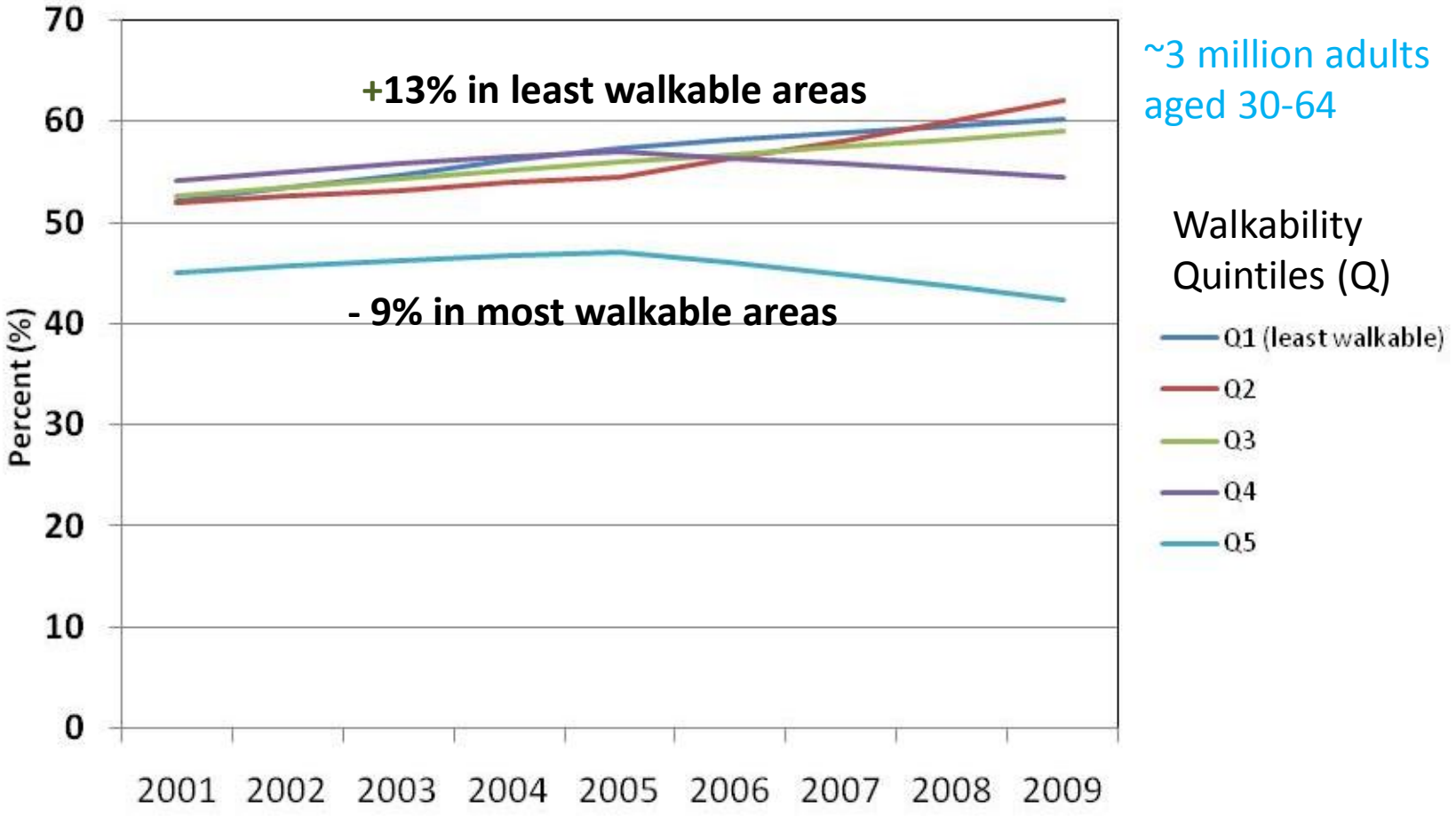
Population-level data




Age-Sex Standardized Diabetes Prevalence (%), 2006 by Census Tract
London
0 5 10 km
York
Durham
Toronto
Peel
Halton
Hamilton
Ottawa
0 10 20 km
0 10 20 km
Diabetes (%)
0.00 - 6.60
6.61 - 8.79
8.80 - 10.66
10.67 - 12.94
12.95 - 17.39

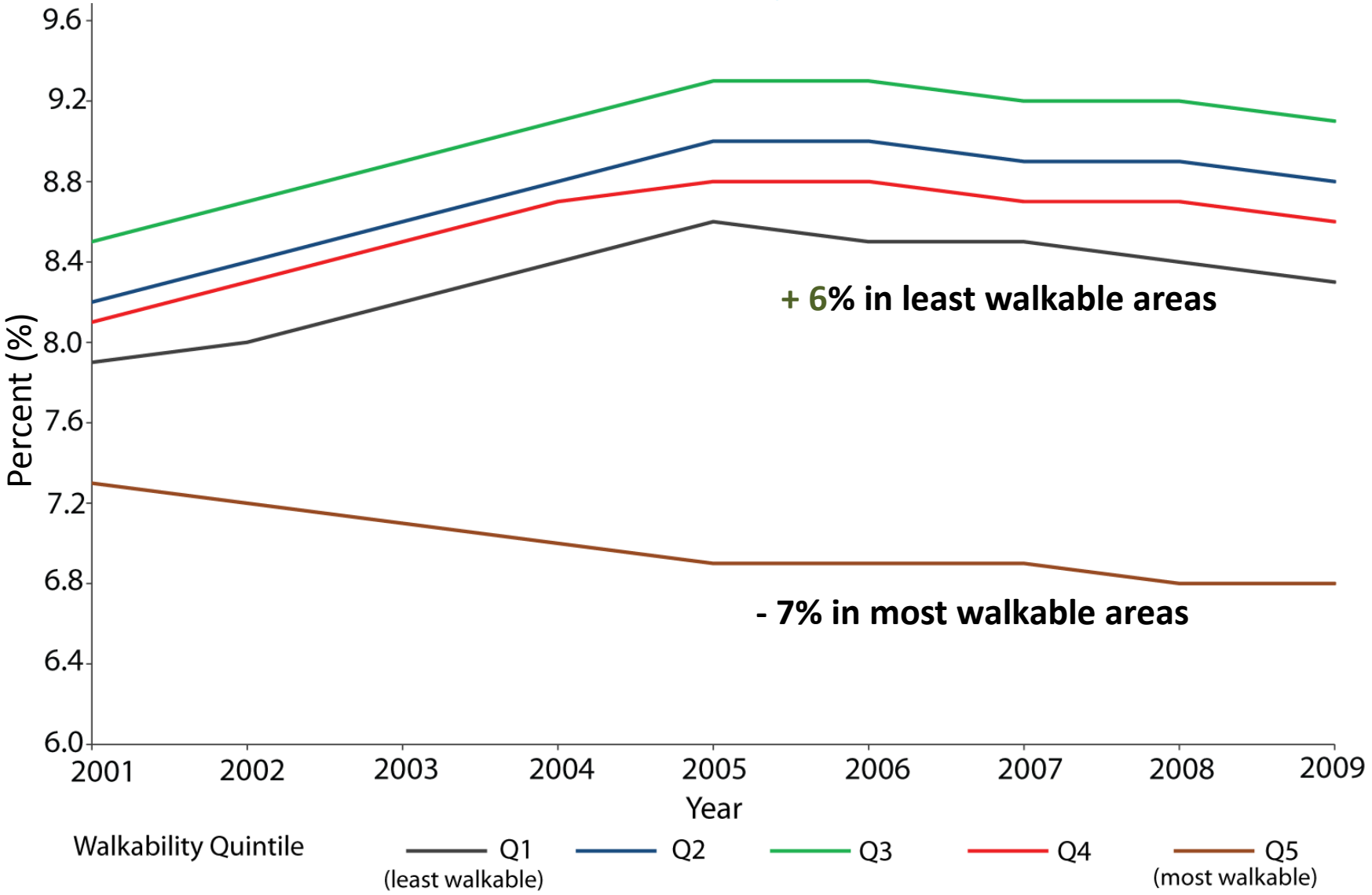

Walkability Index 2006/09
by Dissemination Area
London
0 5 10 km
York
Durham
Toronto
Peel
Halton
Hamilton
Ottawa
0 10 20 km
Walkability Index
-6.26 - -1.14
-1.13 - 1.95
1.96 - 6.15
6.16 - 14.02
14.03 - 27.78
0 10 20 km

Overweight or obesity*in Southern Ontario urban centres, 2001-2009



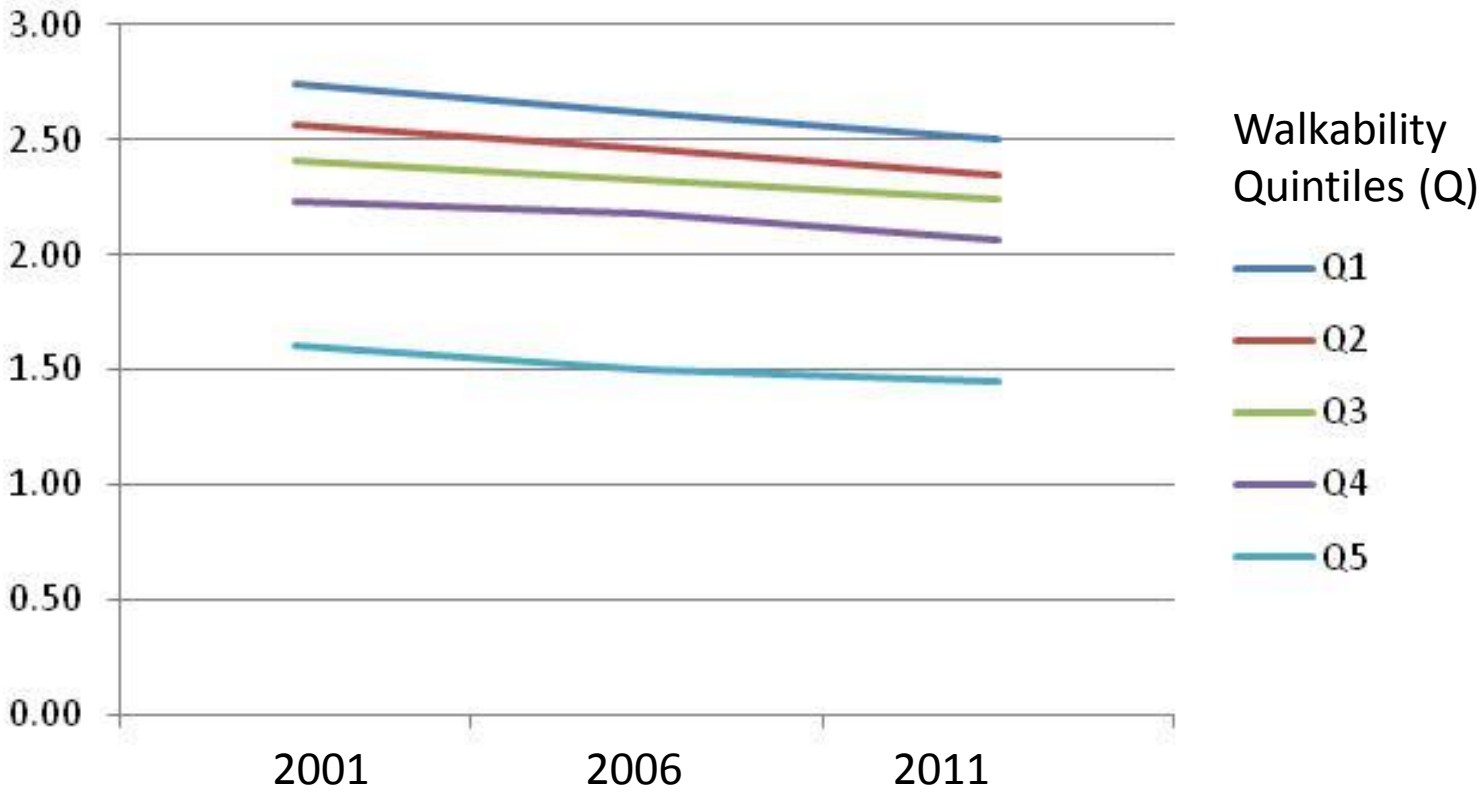
Canadian Community Health Survey *Adjusted for age, sex and based on ethnic-specific BMI thresholds

Diabetes incidence* in Southern Ontario urban centres, 2001-2009



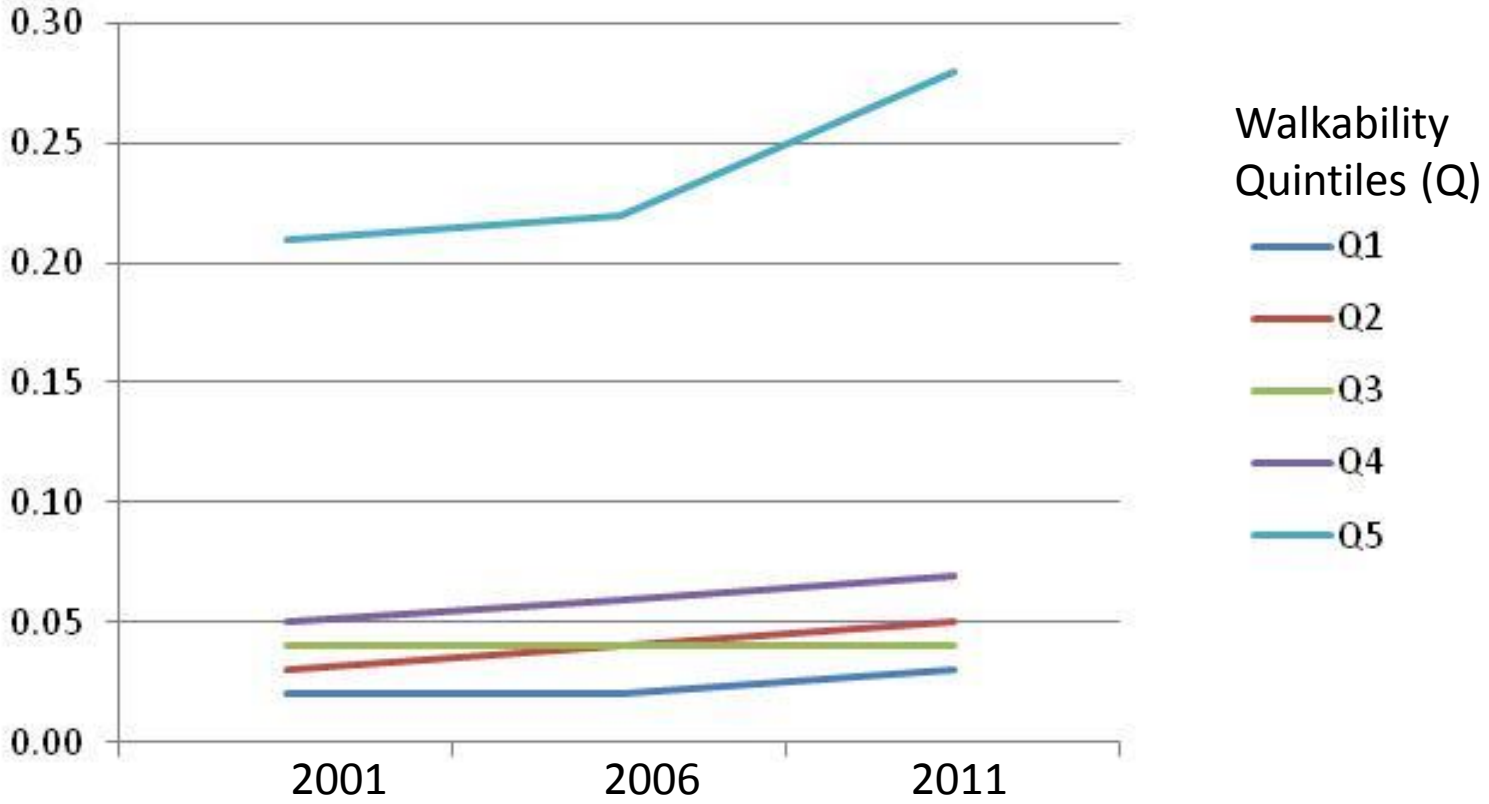
Ontario Diabetes Database, Registered Persons Database *adjusted for age, sex, income, ethnicity; aged 30-64

Number of daily car trips per person* by neighbourhood walkability



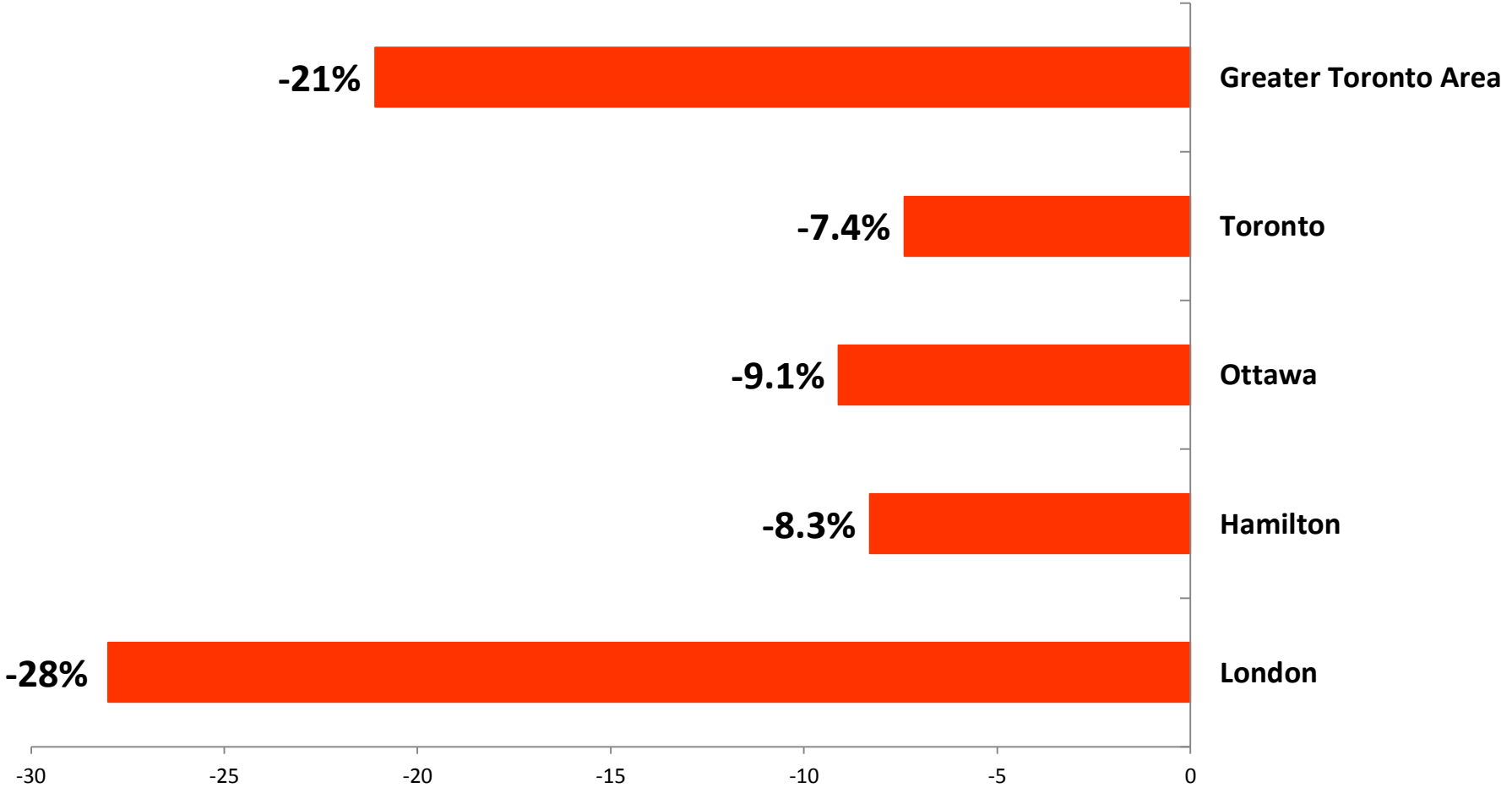
*Transportation Tomorrow Survey, Age 30-64, living in Greater Toronto Area

Number of daily walking or bicycling trips per person,* by neighbourhood walkability



*Transportation Tomorrow Survey, Age 30-64, living in Greater Toronto Area

10-year risk of developing diabetes*among residents in Most vs. Least walkable neighbourhoods



Inverse probability treatment weights created from propensity scores based on age, sex, income, area ethnicity, baseline comorbidity, hypertension, cardiovascular disease (heart attack, stroke) *adults age 30-64

Summary

- Providing more opportunities to be physically active is a key step the battle against obesity and diabetes
- Interventions targeting the built environment that encourage physical activity may have substantial health benefits for the population
- Challenges in translating research findings into policy and planning initiatives will require collaboration across sectors and levels of government

Healthy Cities - Diabetes Prevention

Li Ka Shing Knowledge Institute, St. Michael's Hospital
boothg@smh.ca