

Type 2 Diabetes: Poverty, Priorities and Policy

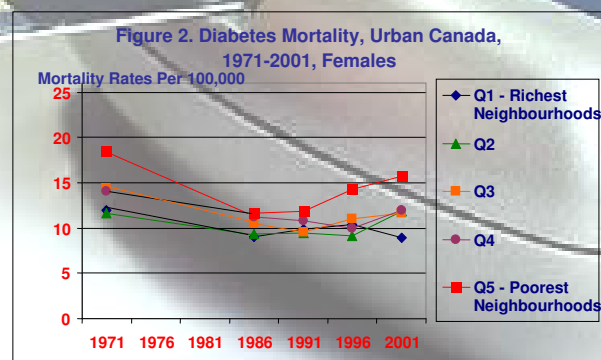
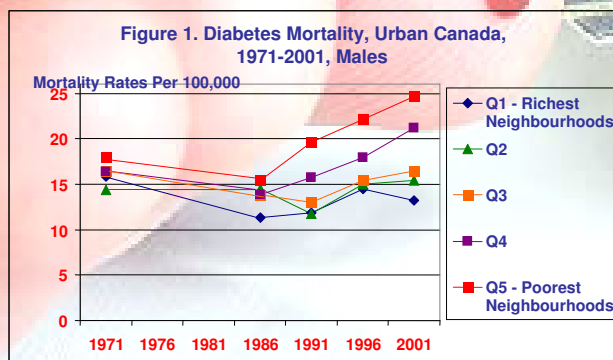
The Social Determinants of the Incidence and Management of Type 2 Diabetes

In 2007/08, a York University team of researchers from the School of Health Policy and Management and the School of Nursing undertook a study to examine the contribution of socioeconomic factors – the social determinants of health -- to the incidence and management of type 2 diabetes. The primary reasons for undertaking this examination were:

- **Findings of an explosive increase in death rates from diabetes among residents of low-income neighbourhoods across Canadian cities¹ (see Figures 1 and 2).**
- **Accumulating evidence that the social determinants of health – the living conditions Canadians experience – are the primary factors shaping the incidence of type 2 diabetes and its successful management.²**

The research involved analysis of existing Canadian statistical datasets, personal interviews with low-income persons living with diabetes, and focus groups with health service providers. The study was funded by the Social Sciences and Humanities Research Council of Canada.

This public report provides an introduction to type 2 diabetes from a social determinants of health perspective and key findings from the study and points the way towards appropriate policy responses. The purpose of these is to provoke discussion about the facts that lead to the incidence of type 2 diabetes and the successful management of the disease when it occurs.



Source: Wilkins, 2007 (data are age-standardized, taking into account increases in age over time)

Context of an Epidemic

Type 2 Diabetes is a complex, chronic condition resulting from the body's inability to either adequately produce and/or effectively utilize insulin. It accounts for 90% of cases of diabetes in Canada. The mechanisms by which type 2 diabetes comes about are not well understood.

Traditional explanations focus on genetic and lifestyle causes, but increasing evidence is coming to support the view that type 2 diabetes is primarily a disease of material and social deprivation associated with poverty and marginalization.³ If not controlled, it can lead to serious complications such as heart disease, kidney failure, lower limb amputation and blindness.

¹ Wilkins, R. (2007). "Mortality by Neighbourhood Income in Urban Canada from 1971 to 2001." Statistics Canada, Health Analysis and Measurement Group and Wilkins, R. Berthelot, J.-M., and Ng, E. (2002). "Trends in Mortality by Neighbourhood Income in Urban Canada from 1971 to 1996." *Health Reports*, 13(Supplement), 1-28.

² Raphael, D., Anstice, S., Raine, K., McGannon, K., Rizvi, S., and Yu, V. (2003). "The Social Determinants of the Incidence and Management of Type 2 Diabetes Mellitus: Are we Prepared to Rethink our Questions and Redirect our Research Activities?" *Leadership in Health Services*, 16, 10-20.

³ McDermott, R. (1998). "Ethics, Epidemiology, and the Thrifty Gene: Biological Determinism as a Health Hazard." *Social Science & Medicine*, 47(9), 1189-1195.

The prevalence of diabetes in Canada has increased dramatically in recent decades. According to the Canadian Diabetes Association, it is estimated that:

- 3 million or more Canadians suffer from diabetes;
- Life expectancy for people with type 2 diabetes may be reduced by 5 to 10 years;
- Healthcare costs for diabetes and its complications have reached \$13.2 billion annually and are rising;
- Direct costs to individuals with diabetes for medicine and supplies can be as high as \$15,000 per year.

Conventionally Accepted Risk Factors

The traditional approach to explaining the incidence of type 2 diabetes focuses on it being associated with a number of individual risk factors, including:

- advanced age
- being overweight or obese
- sedentary lifestyle
- family history of diabetes
- being of Aboriginal origin or belonging to certain ethno-racial groups (e.g. Asian, South Asian, African and Hispanic)
- having high blood pressure or high cholesterol

These individually based risk factors and relationship with type 2 diabetes have led health care providers and policy makers to focus their 'prescriptions' for the prevention and management of type 2 diabetes on the 'trinity' of medication, diet and exercise. The presence of these risk factors has not however, been placed in the context of people's living circumstances and the risk conditions they may have experienced over their lives. For example, it is well documented that adverse early childhood experiences such as fetal malnutrition and poverty are important predictors of the onset of type 2 diabetes in later life.⁴

An Alternate Perspective

Evidence is accumulating for a crucial role for social and economic factors in the development of type 2 diabetes. For example,

- A Toronto Star compilation of data from various surveys shows that the maps of prevalence of diabetes, rates of poverty, and percentage of visible minorities in Toronto are virtually identical: <http://www.thestar.com/staticcontent/772097>
- Among British civil servants, traditional risk factors only account for 10% (of 100%) of who gets the metabolic syndrome, an important precursor of type 2 diabetes (see Bruner and Marmot, 2006 below)
- Among Swedish women, those of lower education were 2.3 times more likely to develop the metabolic syndrome even after accounting for a range of traditional risk factors (see Wamala et al., 1999 below).

The Present Study: Social Determinants Matter...

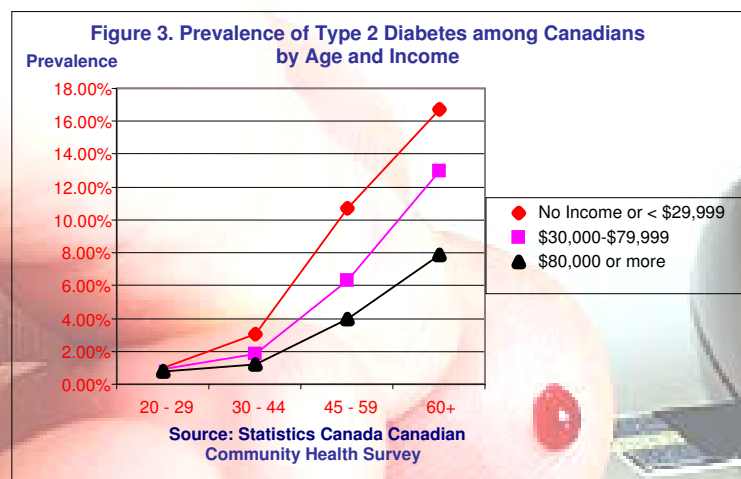
To investigate how the social determinants of health impact the incidence and management of type 2 diabetes, a two-pronged study was carried out. First, we analyzed data from the Canadian Community Health Survey (CCHS) (cycle 3.1) and the National Population Health Survey (NPHS). The CCHS is a very large survey of over 105,000 Canadians. We predicted that a) low income would be a strong predictor of type 2 diabetes; and b) once income was

⁴ Lawlor, D., Ebrahim, S., & Smith, G. D. (2002). "Socioeconomic Position in Childhood and Adulthood and Insulin Resistance: Cross Sectional Survey using Data from the British Women's Heart and Health Study." *British Medical Journal*, 325(12), 805-807; Chaufan, C, (2004). "Poverty versus Genes: The Social Context of Type 2 Diabetes." *Diabetes Voice*, 49, (2), 35-37.

known, risk factors would not tell us much more about having type 2 diabetes. The NPHS is a survey that follows people over time. We predicted living on low income would anticipate people developing type 2 diabetes. This would provide strong evidence of a low income/diabetes link.

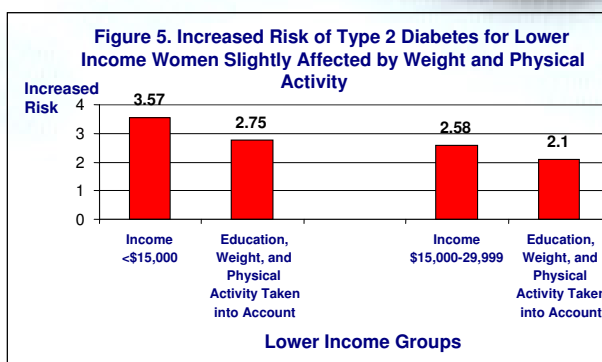
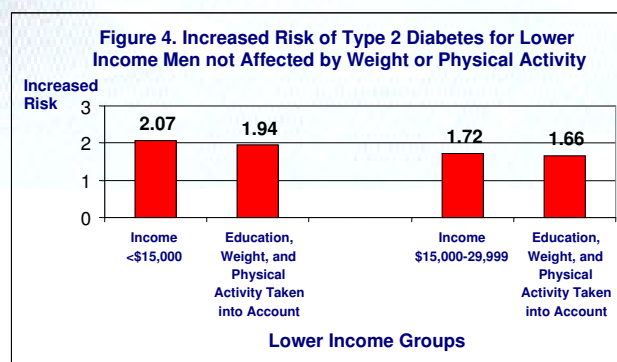
Findings from the Canadian Community Health Survey⁵

Approximately 8,200 respondents reported a diagnosis of diabetes and of those 95.8% or 7806 were identified as having type 2 diabetes. Having type 2 diabetes was strongly related with income and these differences increase with age (Figure 3). Lower-income older Canadians are twice as likely to have type 2 diabetes than wealthy older Canadians.



The important question is whether these differences between lower income and wealthier Canadians can be accounted for by differences in factors such as education, body mass index (BMI) – overweight or obese – and lack of physical activity. Figure 4 shows that for men, being of very low income doubles the risk of type 2 diabetes as compared to the wealthiest group of Canadians (>\$80,000). Once education level, BMI, and physical activity are taken into account – reducing risk by only 6% -- the risk is still very close to

double. For the next group of lower income Canadian males, the increased risk of 1.72 is only reduced to 1.66 – only 2% -- when these other factors are taken into account. Figure 5 shows similar findings. Income plays a stronger role in type 2 diabetes for women. Even after risk is reduced by 22% for the lowest income group and 19% for the next lowest income group by controlling for the risk factors of education, BMI and physical activity, the role income plays in having type 2 diabetes is stronger for women than for men. These findings are consistent with other studies that indicate that living conditions – or the social determinants of health – are primary contributors to the incidence of type 2 diabetes.

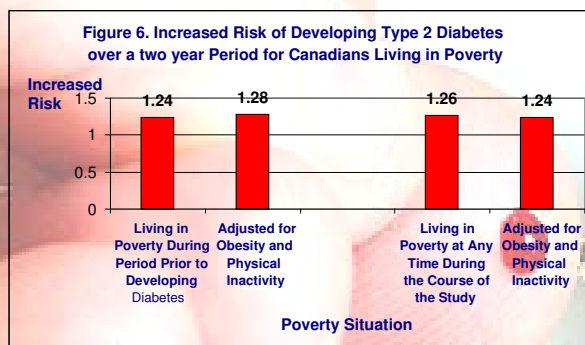


⁵ Dinca-Panaitescu, S., Dinca-Panaitescu, M., Bryant, T., Raphael, D., Daiski, I., Pilkington, B. and Lines, E. "Social Determinants of Type 2 Diabetes: Results of the Canadian Community Health Survey." Toronto: York University School of Health Policy and Management.

Findings from the Canadian Population Health Survey (NPHS)⁶

All seven cycles of Statistics Canada's NPHS survey from 1994/95 to 2006/07 were used to trace 17,276 respondents and observe who developed type 2 diabetes over the cycles. A total of 690 respondents developed type 2 diabetes over the course of the study (about 100 during each two year cycle). The rate at which new cases of diabetes were diagnosed slightly increased from 6.54 per 1000 person-years in 1996/1997 to 7.41 per 1000 persons-years in 2006/2007.

We identified those living in poverty as being in a household of 1 or 2 persons with less than \$15,000 annual income, less than \$20,000 for a household with 3 or 4 persons, and less than \$30,000 for a household with 5 or more persons. We then calculated the risk of developing type 2 diabetes as a function of being in poverty during the period just prior to developing diabetes and the risk of developing type 2 diabetes as a function of having ever lived in poverty during the course of the study. Data were combined for men and women because of the relatively small number of Canadians in the survey developing diabetes during the study.



Living in poverty provides an increased risk of developing type 2 diabetes of 24% over a two year period. Ever having lived in poverty during the study returns a similar figure. These increased risks of developing type 2 diabetes are not affected by being obese or lack of physical activity. A final analysis examined whether living for longer periods of time in poverty increased the risk of type 2 diabetes. **We found that those living more often in poverty over the 12 year study had a 41%**

greater chance of developing type 2 diabetes (risk of 1.41 -- not displayed). Taking into account obesity and lack of physical inactivity only reduced this greater risk from 41% to 36%, a reduction of only 12% of the original poverty-related risk (risk of 1.36).

The Lived Reality of Insufficient Income, Inadequate Housing and Food Insecurity.⁷

The second prong of our study was focused on how living on low incomes affected the day-to-day lives of people trying to manage their type 2 diabetes. Interviews were conducted with 60 clients associated with four community health centres in Toronto.

The participants all had a diagnosis of type 2 diabetes and ranged in age from 30 to 76 years (median age = 57). Most (n = 34) were female. About one third had children under the age of 18 living at home. All participants had an annual income (from all sources) under \$35,000; most (n = 29) had an income between \$10,000 and \$15,000, while nine had an income of less than \$10,000. Typical of the population in the metropolitan area where the research was conducted, the sample was racially and ethnically diverse.

Clients were generally well informed regarding the illness and its management. Thematic analyses of the interview and focus group transcripts demonstrate the importance of the social determinants to the management of type 2 diabetes. Specifically, insufficient income, inadequate and/or insecure housing and food insecurity emerged as key barriers to the effective management of type 2 diabetes.

⁶ Dinca-Panaitescu, S., Dinca-Panaitescu, M., Bryant, T., Raphael, D., Daiski, I., Pilkington, B. and Lines, E. "The Dynamics of the Relationship between Poverty Experience and Type 2 Diabetes: Longitudinal Results." Toronto: York University School of Health Policy and Management.

⁷ Pilkington, F. B., Daiski, I., Bryant, T., Raphael, D., Dinca-Panaitescu, M., Dinca-Panaitescu, S. and Lines, E. (2010). "The Experience of Living with Diabetes for Low Income Canadians." *Canadian Journal of Diabetes*.

Box 1. Themes Exemplifying the Situation of Low-Income People Living with Type 2 Diabetes

- *Resilient Struggle for Survival Amid Hardship*

Regardless of whether they thought life was the same or worse, participants described a daily struggle to survive in the face of multiple challenges presented by having to manage not only their diabetes, but also, the various hardships that arise when living on a low income.

- *Balancing Competing Priorities*

Participants' described the constant juggling act required to survive on a limited income; for instance, having to decide whether to buy good quality food, or diabetes medication, or pay the rent.

- *Making the Best of it*

Participants described how they drew on support and resources from various sources, including friends and family, health services, and community and social services, in order to make the best of their difficult circumstances.

- *Using Knowledge and Bodily Knowing in Diabetes Self-management*

Participants adapted medical and experiential knowledge about diabetes to their individual social circumstances, in order to manage their diabetes as best they could.

"On welfare I lived in a rooming house. We had four or five people using one fridge. I couldn't leave anything in the fridge, it disappeared. And the things the dieticians tell you -- I know they mean well, but I just couldn't afford it... Once I did go to a food bank, but the stuff they give you is the stuff I'm not supposed to have... I used to get a hundred and something [dollars in special diet supplement] but now they cut it back to sixty something." [man, unable to work, income provided by the Ontario Disability Support Program].

"I look at which food is cheaper because my money is very small, so after giving rent, I just have a little bit of money. Sometimes, after the 20th [of the month] my money is finished. It's very tight. So then I buy rice, and some protein and eggs. But when I eat cheap rice my sugar goes up... Sometimes I borrow money because I have to be conscious about my health... Sometimes my daughter's school wants money for things. But I don't have it. How can I give? And I feel very sad. I try to manage. Sometimes I use my daughter's child benefit. And sometimes I don't buy. Last month my money was finished but I had no food at my home and I didn't buy any. I didn't eat. And sometimes I need shoes, but I don't buy them because I have to pay for food. Food is my basic need." [42-year-old married woman].

Particularly evident were the challenges faced by low-wage earners who, by virtue of their paid employment status, do not qualify for the provincially funded drug plan and also do not enjoy access to employer-sponsored coverage.

"I don't test my blood every day, only three days a week, because the strips are very expensive. Sometimes I don't take the medicine every day, because the medicine is expensive and my husband is not working, and because it is not the only medicine that I have to take." [working woman who cleans offices at night].

These findings shed light on a reality that is generally overlooked or not adequately considered in the type 2 diabetes management literature: While living with diabetes is difficult, it is even more so when the person is poor, given the ways poverty intersects with other social determinants of health. Canada's medicare system provides health care and medically necessary treatments, and if the person is on social assistance, medications and test strips -- but not lancets -- for blood sugar testing. However, if the person is not on social assistance, medications and all test materials must be purchased. For all our low-income participants however, Canada's wage structure and social welfare system falls far short in assuring that persons with type 2 diabetes will be able to afford the food they need to manage this illness.

With limited resources, peoples' lives become ruled by competing priorities:

"Well it is very, very bad, especially when I have to buy the needles and my medication. But if I don't have any, I do without until I have the money. The last time, I stayed off medication about three weeks because I didn't have the money to buy it. And then, when I get my daughter's baby bonus I go and I buy it." [58-year-old married woman]

Policy Implications...

Education and lifestyle interventions will not be enough to slow the tide of type 2 diabetes. Comprehensive, population-based policy changes are required; policy changes that recognize and support the need for adequate income; affordable, stable housing; and easy access to the medications and supplies required for diabetes management. Such measures will go a long way toward promoting health and limiting the extent of both human and healthcare costs associated with type 2 diabetes in the long run.

For persons with diabetes living in poverty, adherence to recommended lifestyle and treatment regimens without adequate living conditions and financial resources is difficult, if not impossible. Physicians, nurses, and other health professionals, as individuals and as members of professional organizations, must advocate for poverty reduction, as this is essential to the optimal management, and likely, the prevention, of diabetes.

Optimal management will not only alleviate unnecessary suffering and improve quality of life for these patients, but also, it will save the healthcare system enormous expenses in the future arising from preventable, devastating complications of this chronic disease. Health professionals are well positioned to advocate for needed policy changes to prevent and properly manage diabetes; specifically, eliminating, or, at the very least, alleviating, poverty. Collaboration among professional organizations and with other interested groups around poverty reduction would maximize the impact of advocacy work.

Further Resources

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