

Report on Identification of High Risk Communities and Strategies to Address Diabetes Care

Report to the MOHLTC Implementation Branch

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Stand **UP** to Diabetes

WaterlooWellington
D I A B E T E S



Host Organization

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Summary

Identification of high risk communities and strategies to address diabetes care for high risk populations in the Waterloo-Wellington region, has included a variety of approaches including environmental scans, stakeholder meetings and review of literature.

“The evidence indicates that preventing or delaying the onset of type 2 diabetes results in significant health benefits, including lower rates of cardiovascular disease and renal failure; ~30 to 60% of type 2 diabetes may be prevented through early lifestyle or medication intervention.”¹

Risk factors for diabetes include: ²

- Individuals \geq 40 years of age
- First-degree relative with type 2 diabetes
- Member of high-risk populations
- History of IGT or IFG
- Presence of complications associated with diabetes
- Vascular disease (coronary, cerebrovascular or peripheral)
- History of Gestational diabetes
- History of delivery of a macrosomic infant
- Hypertension
- Dyslipidemia
- Overweight
- Abdominal obesity
- Polycystic ovary syndrome
- Acanthosis nigricans
- Schizophrenia

Through collaboration and education of health care providers and diabetes program planners, activities have been planned and executed to identify gaps in services for those at risk, and to enhance the services being offered.

Reviewing the changing demographics and economic shifts in the region allow the RCC to effectively plan for diabetes services focusing on prevention of high risk communities.

¹ Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J diabetes*. 2008; 32(suppl 1): S2.

² Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J diabetes*. 2008; 32(suppl 1): S16.

This report outlines details on the population and socio- economic factors in the Waterloo-Wellington region and the process that led to the identification of high risk communities as well as strategies planned and implemented to address diabetes care in the region.

Overall Approach

The approach included the following:

1. Conduct an environmental scan of the Waterloo Wellington population
2. Receive input from the community stakeholders (Diabetes Education Programs, Primary Care Providers, Endocrinologists, Patients and other health care providers) through face to face meetings and inventories of service
3. Identify strategies that will have the most impact on population health

Method

The following data and literature search was used to collect information:

Population health info

- Ontario Ministry of Health and Long Term Care, Provincial Health Planning Database
- Statistics Canada, Community Profiles from the 2006 Census
- Canadian Community Health Survey Cycle 4.1, 2007
- BORN Ontario, 2007-2009

Reports:

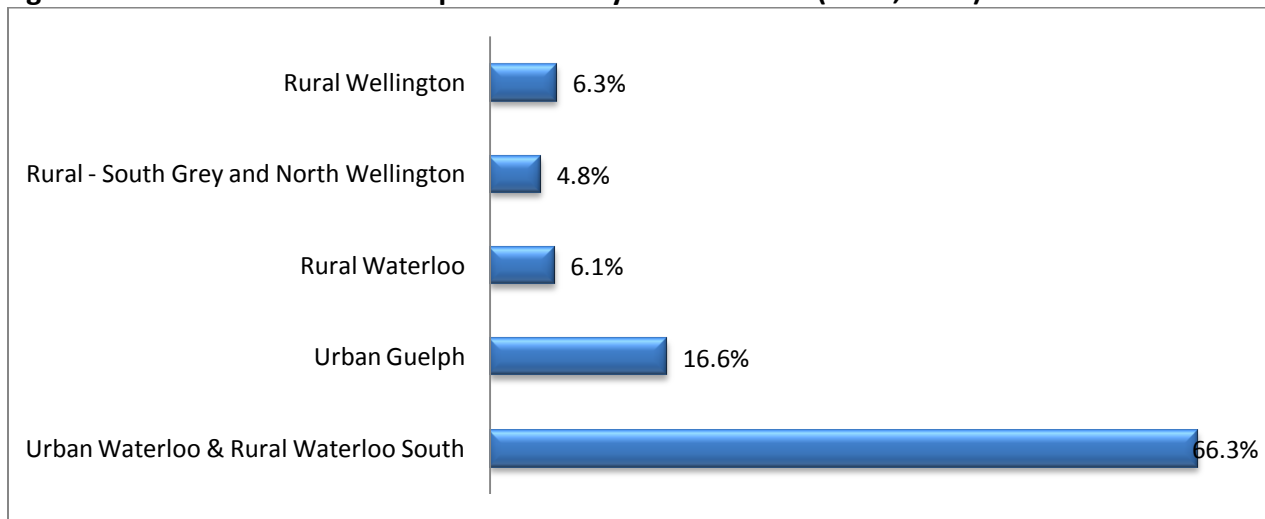
- Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J diabetes*. 2008; 32(suppl 1): S1-201.
- Social Planning Council of Cambridge and North Dumfries, 2010. Recent Immigrants to Cambridge. A Demographic Profile.
- Ontario Diabetes Strategy, Key Performance Measures (Oct. 2010).
- Institute for Clinical Evaluative Studies ,Diabetes on the Map, Diabetes Prevalence Rates per 100 Ontarians (2006/07), by Census Subdivision, WW LHIN.
- Institute for Clinical Evaluative Studies. inTool Reports 2004-2005 Diabetes
- Local Health Integration Network Integrated Health Service Plan, Population Profile and Health Services Utilization Details, 2010-13.
- Policies and strategies for promoting social equity in health. Dahlgren and M. Whitehead, 1991.
- Gestational Diabetes Among Immigrant Women, ICES 2011 (www.ices.on.ca).

- Harris S, Caulfield L, Sugamori M et al. The epidemiology of diabetes in pregnant Native Canadians. *Diabetes Care* 1997;29.
- Rodriguess S, Robinson E, Gray-Donald K. Prevalence of gestational diabetes mellitus among James Bay Cree women in northern Quebec . *Can Med Assoc J* 1999;160.
- Feid D, Zinman B, Wang X, Hux J. Risk of development of diabetes mellitus after diagnosis of gestational diabetes. *CMAJ*. 2008; 179 (3):229-234.
- POWER study, 2002/3 – 2006/7 & Pregnancy in Women with Diabetes, ICES, 1997-2000
- POWER Study: Chapter 2 The Burden of Illness, June 2009
- Khangura S, Grimshaw J, Moher D. What is known about postpartum intervention for women with gestational diabetes mellitus? Ottawa Hospital Research Institute; March 2010
- A Systematic Review of Interventions to Improve Diabetes Care in Socially Disadvantaged Populations by Glazier et. al, *Diabetes Care*, Vol 29, Num 7, July 2006
- Canadian Council on Learning (2008). *Health Literacy in Canada A Healthy Understanding*

Diabetes Prevalence

The prevalence of diabetes in Waterloo Wellington region has increased steadily. As of July, 2011, approximately 47,073 individuals (8.3%)³ were living with diabetes in the Waterloo Wellington region.

Figure 1 Distribution of diabetes prevalence by subLHIN area (BDDI, 2011)



³ The analysis is based on population estimates of 568,039, age 18+, 2008. Data Source: Ministry Finance, Intellihealth database.

The age/sex-adjusted diabetes prevalence rates in the city of Cambridge was highest (9.01-14.00) compared to other Waterloo Wellington subdivisions such as city of Kitchener (7.01-9.00) and city of Waterloo (5.01-7.00)⁴. The population age distribution for Cambridge shows the largest grouping for those aged 40-44 years and more females.⁵

Environmental Scan

Waterloo Wellington region has been divided into five areas for planning purposes. These areas and the corresponding municipalities are provided in Table 1. The Waterloo Wellington LHIN covers approximately 4,800 square kilometres of land. Almost 90% of the WW LHIN's total geographic space is rural. For diabetes system planning, the region is divided in 3 areas, Centre/North Wellington; Guelph/East Wellington, and Kitchener/Waterloo/Cambridge. These 3 regions are consistent with health care planning for the region.

Table 1: Waterloo Wellington Region Planning Areas

WW Region Planning Areas	Communities within the Planning Areas
Urban Waterloo & South Rural Waterloo	City of Waterloo City of Kitchener City of Cambridge Township of North Dumfries
Rural Waterloo	Township of Wellesley Township of Wilmot Township of Woolwich
Urban-Guelph	City of Guelph Township of Guelph/Eramosa Township of Puslinch
Rural Wellington	Town of Erin Township of Centre Wellington Township of Mapleton
Rural North Wellington & South Grey	Township of Southgate Town of Minto Township of Wellington North

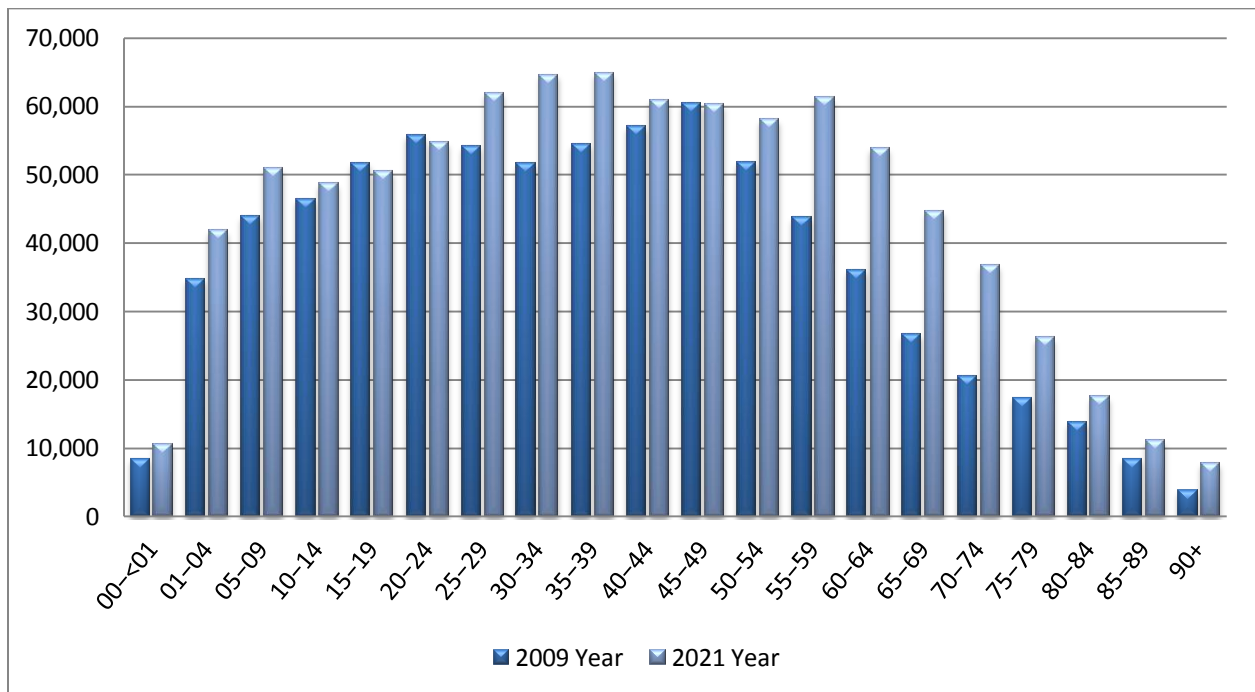
⁴ ICES, Diabetes on the Map, Diabetes Prevalence Rates per 100 Ontarians (2006/07), by Census Subdivision, WW LHIN

⁵ ICES, Diabetes on the Map, Diabetes Prevalence Rates per 100 Ontarians (2006/07), by Census Subdivision, WW LHIN

Population Aging and Growth

In 2009 there were 740,703⁶ residents living in the Waterloo Wellington, which accounts for 6.0% of all Ontarians. Between 2009 and 2021, the population is projected to grow by 19.7%, and is projected to be the sixth fastest growing region in Ontario (Figure 2).

Figure 2 – Waterloo-Wellington Population Projection by Age Group, 2009-2021



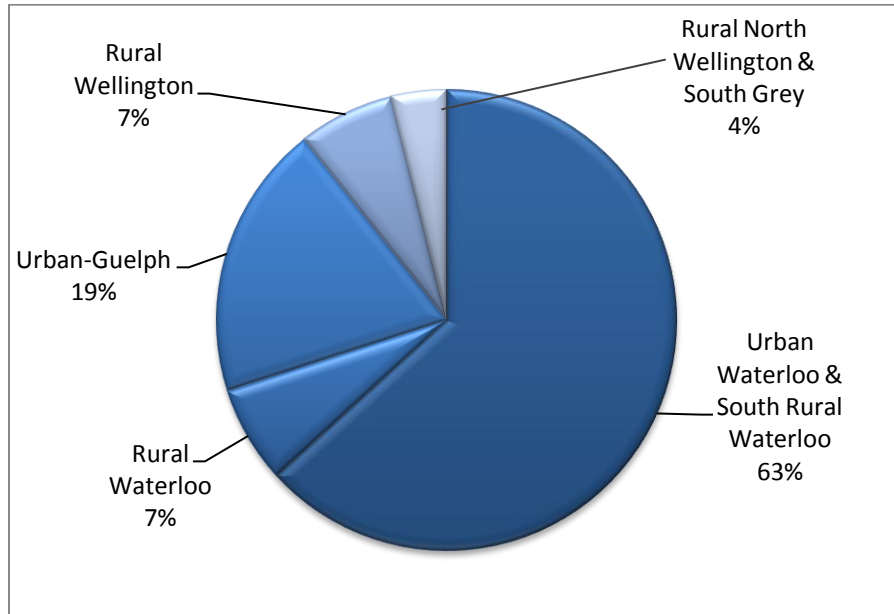
Population aging is a significant factor affecting population health, especially for chronic disease. Currently, the population of Waterloo Wellington is somewhat younger than the provincial age structure. The percentage of residents who are 65+ years is lower (12%) than that of Ontario average (14%). However, between 2009 and 2021, population in this age group is projected to grow faster than the provincial growth (69% vs. 63%).⁷

Over 80% of the population of the Waterloo Wellington lives in two urban planning areas: Urban Waterloo & South Rural Waterloo, comprising 63% of the population (467,881) and

⁶ Data source: Population Estimates, Provincial Health Planning Database, based on 2009 Census

Urban Guelph with 19% (143,156) (Figure 3). Almost two-thirds of residents live in Waterloo. Waterloo has the youngest population of the region with a median age of 37.

Fig. 3 - Population Distribution in WW Region, 2009 (% of total population)



Language and Immigration

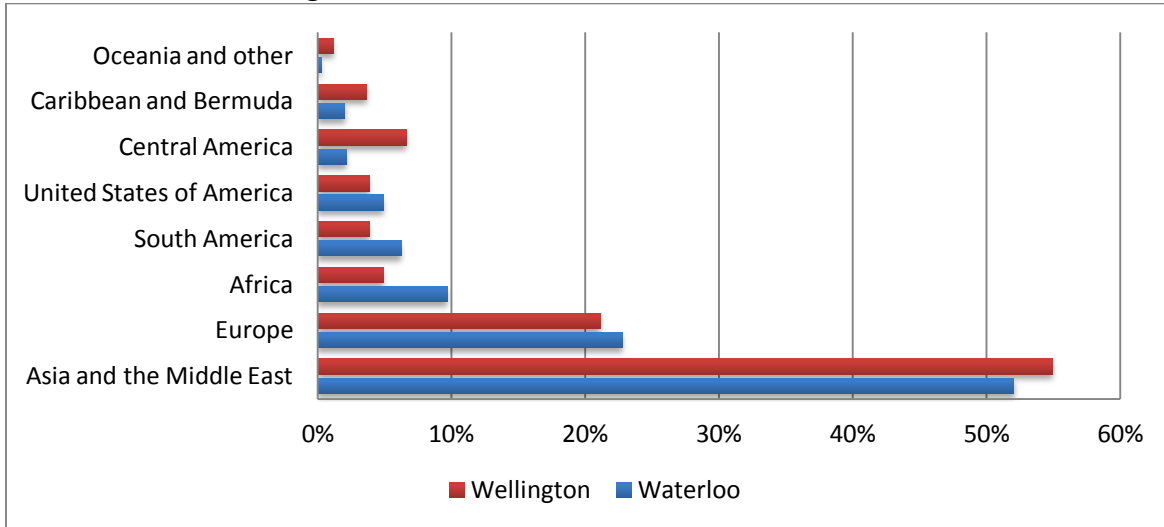
Immigrants represent over 20% of the Waterloo Wellington, which is slightly lower than the provincial average. Historically, the majority of immigrants were from European countries. Next to English, the top five languages in the region are German, Portuguese, Spanish, Polish and Chinese.

Over the past couple of decades there has been change, and today more than 50% of the new immigrants to the region are immigrating from Asia and the Middle East (Figure 4). Over 75% of the new immigrants are settling in the Waterloo area. As an example, between 1991 and 2006 the number of immigrants living in Cambridge increased by 6,860 people, or 37.4%. In comparison, the total population of the city grew by only 29.7% during the same period.

Unfortunately, there is a lack of ethnic-specific health data for Waterloo-Wellington region. In Canada we do know that those with the lowest health literacy were found to be more than 2.5 times more likely to be in poor health compared to those with high health literacy, and the relationship between poor health literacy to health conditions was strongest with diabetes.

Those most at risk are: seniors, immigrants (especially those who do not speak either English or French) and unemployed individuals.⁸

Figure 4 - Countries of Origin



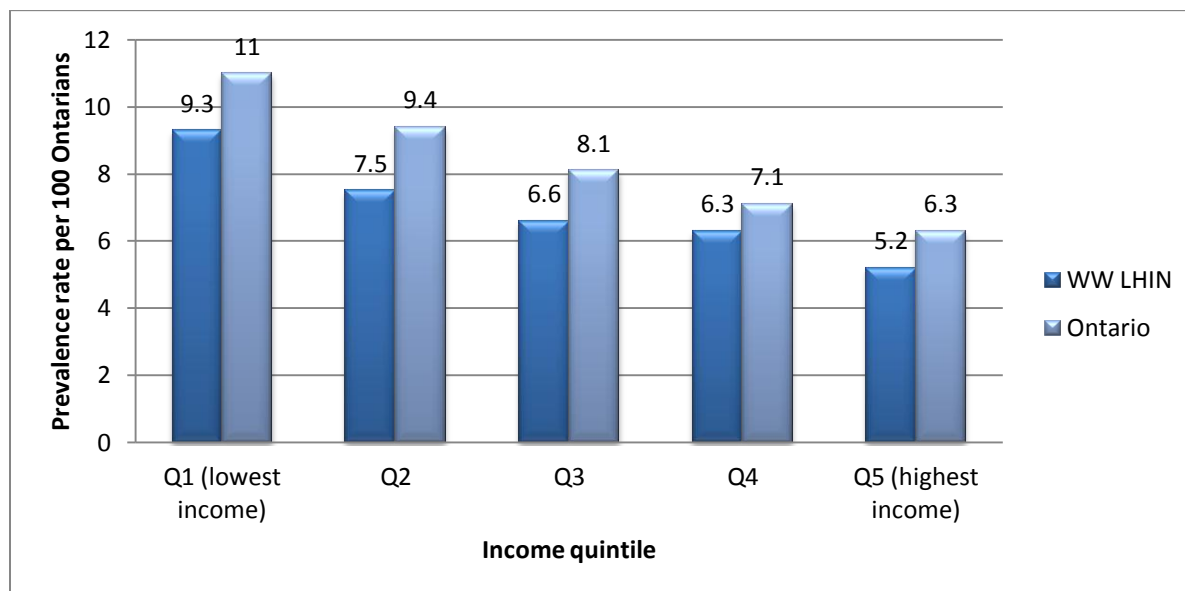
Income

In 2006, over 9% of Waterloo Wellington residents were in low-income bracket before taxes, compared to almost 15% for the Ontario. According to the Statistics Canada, residents of Guelph, Kitchener-Waterloo have the highest proportion of residents living below the low-income bracket. The association between low income and diabetes prevalence is presented in Figure 5. Of note, the development of chronic disease in women is affected much stronger by income level compared to men.⁹

⁸ Canadian Council on Learning (2008). Health Literacy in Canada A Healthy Understanding

⁹ POWER Study: Chapter 2 The Burden of Illness, June 2009

Figure 5 - Diabetes Prevalence Rate by Income Quintile, Waterloo-Wellington Residents, 2004/05



Analysis of Table 2 illustrates that 8.5% of people with low income have diabetes compared with 5.1% prevalence among high-income people.¹⁰ Overall, diabetes prevalence rates gradually decreased with higher socio-economic status.

Table 2: Diabetes Prevalence Rate and Number of Cases by Income Quintile, Waterloo Wellington Residents, 2004/05

Income quintile	Population	Cases	Crude rate	Age- & sex-adjusted rate	Lower limit for 95% confidence interval	Upper limit for 95% confidence interval
All	506,425	32,959	6.5	6.7	6.6	6.8
Q1 (lowest income)	85,219	7,269	8.5	9.3	9.1	9.5
Q2	97,964	7,345	7.5	7.5	7.3	7.7
Q3	97,227	6,209	6.4	6.6	6.4	6.7
Q4	97,313	6,012	6.2	6.3	6.2	6.5
Q5 (highest income)	115,338	5,841	5.1	5.2	5.1	5.4

¹⁰ Data source: intool.ices.on.ca

Note: Income quintiles characterize neighbourhoods, not individual households

Other Regional Highlights:¹¹

- 24% of Waterloo Wellington residents 15 years of age and over, have no certificate, diploma or degree, which is slightly higher than the provincial at 22%.
- Population is engaging in less healthy behaviour. Percentage of people who are overweight or obese was 53.9% compared to the provincial (51.8%).
- Lower percentage of the population consuming fruits and vegetables
- Lower proportion of residents participating in physical activity
- The percentage of heavy drinkers in WW LHIN (23.5%) is slightly higher than the provincial (21.7%)

Gestational Diabetes (GDM)

GDM is the most common medical complication of pregnancy and affects up to 7% of pregnancies among predominantly white women (CDA, 2009), with increasing rates to as high as 8.5% -13% among Native Canadians and Cree women^{12 13}. Research also showed that women from East Asia had a 2 times higher risk of developing GDM than their Canadian-born counterparts (Gestational Diabetes Among Immigrant Women, ICES 2011. www.ices.on.ca). Women with GDM have a 20% risk of developing T2DM within 9 years postpartum¹⁴.

Analysis of statistical data collected from BORN Ontario, review of evidence-based reports¹⁵ relevant to Waterloo Wellington population and input gathered through engagement and consultation with expert group revealed the following:

- Women with GDM accounted for 3.8% (816) of all deliveries for a three year period
- Women with diabetes were more likely to delivery by C-section (42.5%) than women without diabetes (25.2%)
- Women with diabetes were more than three times as likely to have a diagnosis of preeclampsia
- Women with diabetes were more than four times as likely to have hypertension
- 46% of the babies were born with macrosomia (>3500g)
- 1.4% of the babies were born with shoulder dystocia
- % of infants born to women with GDM/without who were delivered pre-maturely was 11.6% vs. to 6.2% (The POWER study)

¹¹ Waterloo Wellington Local Health Integration Network Integrated Health Service Plan, Population Profile and Health Services Utilization Details, 2010-13

¹² Harris S, Caulfield L, Sugamori M et al. 1997.

¹³ Rodriguess S, Robinson E, Gray-Donald K. 1999.

¹⁴ Feid D, Zinman B, Wang X, Hux J. 2008.

¹⁵ POWER study, 2002/3 – 2006/7 & Pregnancy in Women with Diabetes, ICES, 1997-2000

- % of women with/without diabetes visiting specialists (Endocrinologist or Internist) during pregnancy was 63% vs. to 2% (ICES)
- % of women with/without diabetes having retinal exam during pregnancy was 31% vs. 12%

Of special note for this region: there is a high rate of mid-wife deliveries, which is not captured in the BORN data.

In reviewing the literature, a summary of Ontario data provided by Khangura et al. for the Champlain LHIN, noted the following:

- A 2008 analysis of Ontario-wide data over a 7 year period found that 20% of women with GDM go on to develop T2D over 9 years; authors note that GDM is increasing and that women in the study who delivered later (1999-2001) have developed T2D sooner as compared to those who delivered earlier (1995-1996) suggesting that the problem is worsening.¹⁶
- Multiple studies have linked prenatal exposure to GDM with a higher risk for development of several conditions later in life; most notably overweight/obesity and T2D, in addition to potential delays/impairment to neurological function.¹⁷
- Key Messages¹⁸
 - GDM is a significant risk factor for future development of impaired glucose tolerance (IGT) and T2D.
 - Current rates of postpartum screening and intervention in women with a history of GDM (hGDM) are suboptimal)
 - Screening recommendations for postpartum management of GDM vary considerably across national and international guideline-producing organizations
 - Both health care providers and women with GDM face multiple barriers to adequate screening and preventive interventions.
 - Few screening and/or preventative therapeutic protocols and/or interventions for women with GDM have been developed and empirically examined.

Inventories of service and stakeholder interviews indicated that there was no consistency in the management of gestational diabetes in the Waterloo-Wellington region, and was identified as a concern from many of the diabetes specialists in the region.

¹⁶ Khangura S, Grimshaw J, Moher D. What is known about postpartum intervention for women with gestational diabetes mellitus? Ottawa Hospital Research Institute; March 2010

¹⁷ Khangura S, Grimshaw J, Moher D. What is known about postpartum intervention for women with gestational diabetes mellitus? Ottawa Hospital Research Institute; March 2010

¹⁸ Khangura S, Grimshaw J, Moher D. What is known about postpartum intervention for women with gestational diabetes mellitus? Ottawa Hospital Research Institute; March 2010

Prediabetes

People with prediabetes are at high risk of developing T2DM. “Lifestyle interventions have been shown to be highly effective in delaying or preventing the onset of diabetes in people with IGT.”¹⁹ In order to delay or prevent the onset of T2DM, education and awareness around lifestyle modification is necessary. Prediabetes education is offered in Centre/North Wellington and in Guelph, by the community diabetes education programs. In the Kitchener/Waterloo and Cambridge area, prediabetes education was performed by the Canadian Diabetes Association by a volunteer retired diabetes nurse educator and attendees were encouraged to join the *Smart Start* program at the YMCA. Incoming referrals to the Diabetes Education Programs were redirected to the CDA for education (Figure 6).

Concerns identified with the prediabetes education in Kitchener/Waterloo/Cambridge area included:

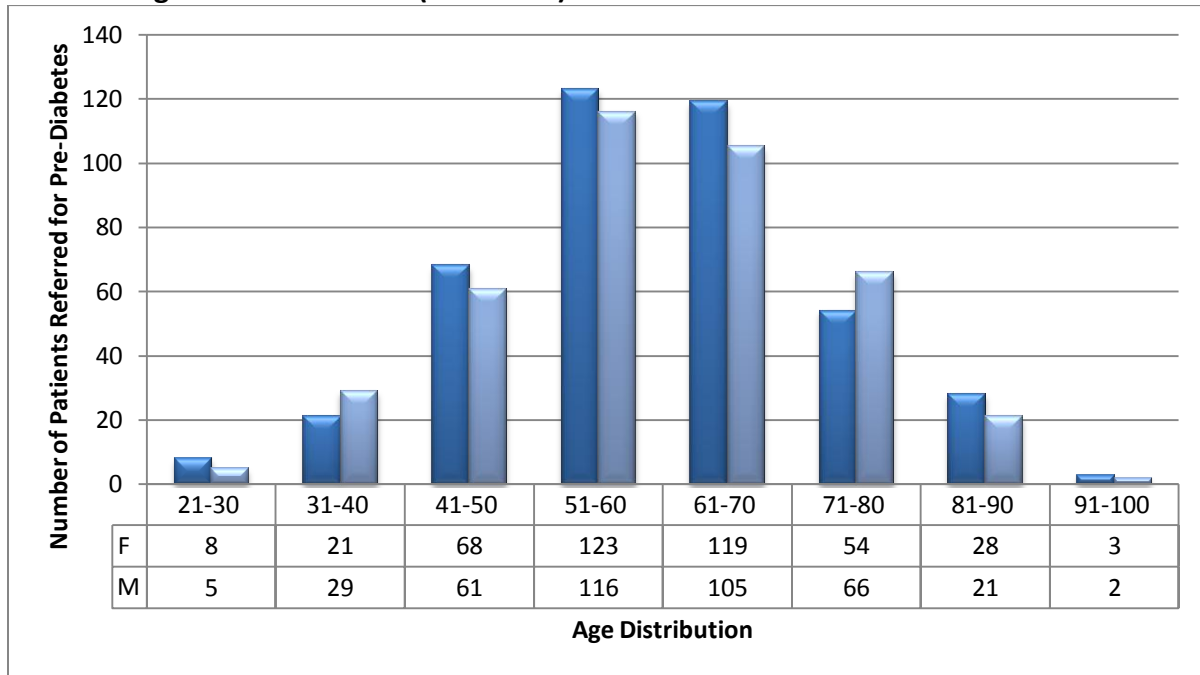
- physician referrals were being sent to a non-health service provider without consent, which breaches the Personal Health Information Protection Act (PHIPA)
- sustainability of program was a concern as it was delivered by volunteers
- ability to individualize content/agenda/treatment was not available as it was a prepared presentation delivered by volunteers
- many of the referrals had hyperlipidemia and hypertension
- there was no nutritional education in the presentation

Strengths identified with this program included:

- strong partnerships were developed
- *SmartStart* program at the YMCA offered an excellent exercise and support group for individuals with prediabetes and type 2 diabetes

¹⁹ Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. *Can J diabetes*. 2008; 32(suppl 1): S11.

Figure 6 - Age and Sex Distribution of Pre-Diabetes Referrals Received in Kitchener, Waterloo and Cambridge from 2009- 2011 (CDA Class)



Activities and strategies planned to address at-risk populations

Outreach Planning Day – August 17, 2011

Many programs are providing programming and services under the umbrella of outreach services. In order to assist with planning and targeting populations in need, the outreach planning day was organized to review information on the social determinants of health, cultural tailoring, health literacy and community profiling. The day also introduced people from various organizations which encouraged sharing of information and ideas. Population maps with prevalence data were distributed to all the attendees to support them with program planning.

“Interventions for socially disadvantaged populations can be effective and have the potential to reduce health disparities in diabetes care and outcomes. The key aspects of tailoring in the reviewed studies were for culture and health literacy”²⁰

Presentations were conducted on South Asian Diabetes Outreach Activities and Health Literacy to enhance the knowledge and promote the generation of ideas for planning purposes.

²⁰ A Systematic Review of Interventions to Improve Diabetes Care in Socially Disadvantaged Populations by Glazier et. al, Diabetes Care, Vol 29, Num 7, July 2006

The RCC developed an outreach planning framework with an emphasis on performing an environmental scan to identify at-risk populations in the community. Two workshops were conducted to assist programs in completing a plan for outreach services:

Workshop #1 – Addressing the Social Determinants of Health

In this workshop groups worked together to brainstorm ideas to effectively address health inequities in our community. Public health action must be taken at each layer of the Dahlgren and Whitehead's (1993) multilevel Rainbow. This model is widely used to identify the full range of health determinants. In this model, determinants are categorized based on their level of influence. In addition, the rainbow model highlights the interactions between layers and between various determinants of health.

Workshop #2 – Developing a Plan of Action

Utilizing the a summary worksheet, groups were encouraged to partner with local colleagues in attendance to develop objectives and answer leading questions to assist in completion of a community outreach plan. Tools were provided from the MOHLTC, CDC, NDSS, and PHAC.

Gestational Diabetes Pathway Advisory Panel Meeting – November 23rd, 2011

On reviewing the data for outcomes from women with gestational diabetes, and T1 and T2 in pregnancy for the Waterloo-Wellington LHIN, the maternal and fetal outcomes related to GDM, were higher than the provincial average. Also, the population data indicates that this region has a high number of child-bearing age women. Along with the reported data, consultations also indicated gaps in the current GDM process and management.

The first step in collaboration, was to meet with other stakeholders in the region to get a clear picture of current care pathways in the LHIN. This information was then used to generate a discussion with key opinion leaders (endocrinologist/internist, RN's, RD's, Midwives, obstetricians, and primary care providers) in the area to identify gaps and solutions. Centre Wellington presented their work to date on a project funded by the Public Health Agency of Canada to develop a GDM community pathway to standardize care (preconception -post partum). The RCC has partnered with the project leads to help ensure that the pathway developed can be utilized across the LHIN.

The first advisory panel meeting was held the end of November, and the next meeting is scheduled for February with the intent to develop a regional pathway for GDM, as well as standards for consistent management. Short-term goals include improved maternal and fetal outcomes. Long-term goals include reduced progression to Type 2 diabetes for both mother and child.

Prediabetes

As described above, on review of the prediabetes programs offered in the region, there were concerns identified with the program offered in Kitchener/Waterloo/Cambridge. As a result, it was recommended that the prediabetes education should be repositioned with the community diabetes education programs. Further review was taken of the inventory of services and program statistics and there was ample capacity with the community program's current resources. As the RCC moves forward with the launch of central intake for diabetes education referrals, it also will allow a location to direct prediabetes referrals.

Meetings are taking place to develop a prediabetes program that is sustainable, and meets the needs of the community involved. Program planning includes developing methods to evaluate the program, both short and long-term.

Further Activities Planned for 2012

- Cultural Sensitivity Training for health care professionals
- Prediabetes program planning and development of an evaluation system
- GDM Pathway Advisory Panel – Consensus on pathway and implementation plan
- Partnership with CDA – Health Literacy
- Identify programs available for seniors and long-term care homes
- Potential mobile health pilot project with Canada Health Infoway, demonstrating the use of mobile health devices as an alternative form for education and support for those people who may not attend traditional education classes