TORONTO

STAFF REPORT
ACTION REQUIRED

Diabetes Prevention Strategy

Date:	June 4, 2013
To:	Board of Health
From:	Medical Officer of Health
Wards:	All
Reference Number:	

SUMMARY

Type 2 diabetes is a serious chronic disease and continues to be a growing public health challenge. Over the coming decades diabetes rates are projected to rise due to the aging population and increasing rates of obesity. The estimated prevalence rate of diabetes for adults over the age of 20 is 8.1% for Toronto, as compared to 7.7% for the rest of Ontario.[1] Behaviour change and supportive environments that aim to increase healthy eating and physical activity, have the potential to prevent or delay development of type 2 diabetes in high-risk populations and to reduce the associated burden of ill health and healthcare costs.[2]

This report provides an update on the evaluation of the Toronto Public Health (TPH) Diabetes Prevention Strategy (DPS) as requested by the Board of Health on November 21, 2011.

In 2009, the DPS began as a pilot in two neighbourhoods and six selected workplaces. The two neighbourhoods, Malvern and Jamestown - West Humber-Clairville (referred to as "Rexdale")[3], were selected due to the high rates of diabetes and low levels of health services and community resources. The workplaces which were selected had ethnically diverse workforces and were from sectors where employees were more likely to have precarious employment and hence were potentially at higher risk for type 2 diabetes. In the third year, the DPS expanded citywide. The interventions included risk assessment workshops for type 2 diabetes, healthy eating and physical activity programs, peer-led diabetes prevention programs, public awareness campaigns and initiatives to help create environments that support healthy eating. The program directly reached almost 8,000 people over a three-year period, along with an estimated two million reached through the public awareness activities.

The evaluation findings showed that the DPS activities, in particular the Peer Leadership component, were effective in reaching communities at high-risk for developing type 2 diabetes. The DPS activities were also effective in increasing program participants' knowledge of risk factors for type 2 diabetes and promoting positive behaviour change to reduce their risk of developing type 2 diabetes. Details of the evaluation methodology and results can be found in the "Diabetes Prevention Strategy 2009-2012: Evaluation Report", available at http://www.toronto.ca/health/diabetes/resources.htm.[4]

TPH's comprehensive approach, collaboration with community agencies and leveraging of community resources resulted in delivery of a program that was able to meet the needs of diverse cultures. The DPS program achieved positive results and can serve as a model for future interventions to promote the health of ethno-culturally diverse communities of Toronto.

The DPS was funded by the Ministry of Health and Long-Term Care (MOHLTC) and Ministry of Health Promotion and Sport (MHPS) over the past four years. TPH was advised that, based on the program's success, funding will continue for an additional three-year period until 2016. This will allow the continuation of the intensive and comprehensive diabetes prevention programs with populations most at risk for developing type 2 diabetes.

RECOMMENDATIONS

The Medical Officer of Health recommends that:

1. The Board of Health communicate the results of the Toronto Diabetes Prevention Strategy 2009-2012 evaluation to the Minister of Health and Long-Term Care and the Chief Executive Officers of Toronto Central, Central East, Central, Central West and Mississauga Halton Local Health Integration Networks.

FINANCIAL IMPACT

There are no financial impacts of these recommendations.

DECISION HISTORY

In April 2009, the Board of Health approved an increase in the TPH's Operating Budget to reflect confirmed one-time funding from the MHPS for the implementation of a diabetes prevention strategy.
(http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2009.HL22.2)

At its meeting on November 21, 2011, the Board of Health received an update on the implementation of the DPS from April 2009 to March 2011.[5] The Board of Health requested continued funding after March 31, 2012, from the MOHLTC for DPS activities that focused on high-risk populations in the City of Toronto. The Board of Health also

requested that the Medical Officer of Health report on the evaluation results upon completion of the DPS pilot project in 2012. (http://app.toronto.ca/tmmis/viewAgendaItemHistory.do?item=2011.HL9.3)

ISSUE BACKGROUND

Type 2 diabetes is a serious and debilitating chronic disease that is preventable. It occurs when the body cannot produce enough insulin or cannot use insulin properly. Insulin is a hormone that regulates blood sugar. Early symptoms include frequent infections, blurred vision, high blood pressure, pain and numbness in hands and feet, and erectile dysfunction. Over time, the condition can lead to blindness, heart disease, loss of limbs, and kidney failure.

The risk of developing type 2 diabetes increases with age, obesity and physical inactivity. Individuals from South and East Asian, Black, Aboriginal and Latin American populations are at higher risk.

Over 1.2 million of Ontarians live with diabetes and that number is expected to reach 1.9 million by 2020.[6] Healthcare costs for people living with diabetes range from $3,000 to over $5,000 a year, depending on complications.[7] By 2020, it is estimated that the costs to the Canadian healthcare system will reach $16.9 billion.[8] Given that the rates of diabetes are projected to rise in the future, these costs will only grow and place a significant financial burden on the Ontario healthcare system. In Toronto, the estimated prevalence rate of diabetes for adults over the age of 20 is 8.1%, as compared to 7.7% for the rest of Ontario.[9] Research shows that where a person lives in Toronto can impact their risk of developing type 2 diabetes.[10] In addition, people living in poverty have higher rates of the disease.

In most cases type 2 diabetes can be prevented or its onset delayed with healthy behaviours that include healthy eating and physical activity. Best practice suggests a comprehensive approach that includes health education, skill building and the creation of environments supportive of healthy eating and physical activity can help individuals reduce their risk of developing type 2 diabetes.[11,12]

COMMENTS

The DPS was developed to raise awareness of the risk factors for type 2 diabetes and to increase the opportunities to reduce the risk among populations at high risk of developing type 2 diabetes. The three-year pilot project began in 2009 with funding through the MHPS. A funding extension opportunity allowed the project to continue for a fourth year in 2012-2013.

Community Focus

The foundation for the DPS was the community partnerships formed between TPH and Community Health Centres (CHCs) in the two communities selected for the pilot. With funding through the MHPS four outreach workers were hired through the two CHCs to

support the DPS initiatives. TPH staff worked with the outreach workers, CHCs and other community-based agencies to raise awareness of the risk factors for type 2 diabetes and to provide culturally appropriate programs for priority populations within the two communities, including South and East Asian, Black, Latin American, Aboriginal and low-income groups. The outreach workers were crucial in reaching ethno-cultural community groups to which TPH had limited access. They had a deep understanding of their community's health needs and were able to provide insight on the cultural appropriateness of the interventions.

The activities implemented in the two pilot communities included a combination of awareness raising and health education activities. Prevent Diabetes NOW! (PDN!) workshops aimed to increase awareness of risk factors and how to prevent or delay type 2 diabetes. Initially delivered by TPH staff, the workshops were later also implemented by the outreach workers. Workshop participants completed the Canadian Diabetes Risk Assessment (CANRISK) Questionnaire, a validated risk tool[13], to assess their risk for type 2 diabetes. If participants' scores indicated a high risk for developing type 2 diabetes, they were referred to CHCs for follow up and/or encouraged to see a healthcare provider. Workshop participants were also provided the opportunity to decrease their risk of type 2 diabetes through multi-week healthy eating and/or physical activity programs. Both programs promoted healthy behaviour change, and were delivered by TPH staff. The physical activity program was co-delivered by a Parks, Forestry and Recreation fitness instructor funded through the DPS.

In 2011-2012 the delivery of the PDN! workshops by TPH staff was expanded beyond the two pilot communities to community agencies and select workplaces city-wide.

City-Wide Peer Leadership Program

The Peer Leadership Program was developed in 2011 based on the success of community partnerships and the activities carried out by the outreach workers in the two pilot project communities in 2009-2010. A literature review carried out in 2011 also supported the use of community members, or peer leaders, as a way to provide effective, culturally appropriate interventions that could help to prevent type 2 diabetes.[14]

The Peer Leadership Program's goal was to increase the capacity within Toronto neighbourhoods with high rates of diabetes, beyond the two pilot communities, to provide peer-led health education programs to adults at risk for developing type 2 diabetes.

In 2011, TPH partnered with 14 community agencies to plan and deliver peer-led health education sessions that focused on type 2 diabetes prevention. The agencies included community health centres, newcomer/settlement agencies, adult language programs and cultural associations from across Toronto (Attachment 1).

The agencies were responsible for recruiting and supporting the peer leaders to deliver DPS activities, submitting progress reports and collecting data for program evaluation purposes. To support the program implementation each community agency received funding up to $5,000. In the Fall of 2011 TPH Public Health Nurses and Public Health

Dietitians trained a total of 114 peer leaders. Peer leaders also received a Facilitator Guide that included background information and lesson plans on type 2 diabetes prevention.

The role of the peer leaders included outreach, promotion, adaptation and delivery of culturally relevant and appropriate diabetes prevention programs for high-risk populations. The goal was to enable high-risk community members to reduce their risk through increased awareness and behaviour change in the area of healthy eating and physical activity. The peer leaders implemented health education sessions and other activities in their communities until March 31, 2012.

Addressing Barriers to Program Participation

To minimize the challenges to program participation and to maximize positive behaviour change a number of barriers were addressed by TPH and partner agencies.

Participants were reimbursed for public transit costs and child minding was provided to enhance access to programs and services. From a linguistic perspective interpreters and translated resources (e.g., CANRISK Questionnaire) were available. The peer-led health education sessions were delivered in English and in 23 other languages, and the program evaluation forms could be completed in any language and were later translated for data analysis by TPH. Finally, from a cultural perspective, adaptations such as providing Reggaerobics and Bollyfit as part of physical activity program, or healthier ethnic recipes made the program more meaningful to participants. The evaluation forms were also revised to make them more inclusive and representative of diverse ethnic foods, and easier to understand from a language perspective.

Workplace Focus

In addition to working with the two pilot communities, given the amount of time adults spend daily in a workplace setting, a component of the DPS strategy was also dedicated to providing programs and services in workplaces. The workplace component was developed based on two overarching goals. The first goal focused on encouraging workplaces to adopt comprehensive workplace health programs that considered not only individual health practices but also how the workplace's culture and environment impacted health. The second goal was to raise awareness and provide supports for the prevention of type 2 diabetes directly to employees in the workplace setting.

In 2009-2010 after development of specific selection criteria[15], six workplaces were identified to take part in the DPS pilot project and expressed formal commitment to participate. Three additional workplaces were recruited through TPH staff outreach efforts in 2010-2011. The participating workplaces included manufacturing, hospitality, food and beverage, and services sectors. Each had an ethno-culturally diverse workforce and/or employees that experienced precarious employment and hence more likely to be at risk for developing type 2 diabetes. TPH staff provided workplaces with information and tools to assist them in improving the health of both the employees and the organization as a whole, and worked with the workplaces to implement customized health promotion programs that included the previously mentioned Prevent Diabetes NOW! workshops.

In 2010-2011 the outreach efforts coincided with a period of economic downturn and employers shifting their priorities, which resulted in a much weaker than expected ability on the part of the workplaces to engage in health promotion programs. One of the participating workplaces had to suspend activities due to staff layoffs and plant closure.

In the third and fourth year of the project, DPS activities were integrated as part of Chronic Disease and Injury Prevention (CDIP) workplace programs and offered to interested workplaces city-wide without the requirement of a formal agreement. Programs were customized and delivered based on the needs of employees and workplaces, their readiness and capacity, and as a result differed in intensity and duration.

Public Awareness Strategy

Public awareness activities and materials focused on raising awareness of the risk factors for type 2 diabetes, reinforced diabetes prevention messages and directed community members to connect with TPH for more information.

A key component of the public awareness strategy was the ethnic and local media campaigns. Focus groups were carried out in 2009, with diverse groups of community residents recruited by outreach workers, the findings of which influenced the development of the campaign messages. Additional focus groups in 2011 provided valuable feedback that resulted in revisions to materials to make them more culturally appropriate and relevant to communities at risk for type 2 diabetes. The campaigns focused on increasing awareness of type 2 diabetes risk factors through ads in ethnic and local newspapers, ads on public transit buses in specific neighbourhoods and posters in high-rise apartment buildings across the City of Toronto.

Program Evaluation

An evaluation of the DPS three-year pilot project aimed to increase the understanding of the effectiveness of the DPS activities within Toronto's multi-cultural communities and thus inform future diabetes prevention strategies for similar populations.

The evaluation methodology consisted of multiple data collection mechanisms and tools, in both community and workplace setting. These included focus groups, pre and post surveys, key informant interviews all of which were tailored to the cultural and language needs appropriate to the participants. Both quantitative and qualitative information was collected from program participants, peer leaders, agency partners and TPH staff over the three-years. Where possible, data was collected from program participants prior to their involvement in the intervention, at the end of the intervention, and again 12 months post-intervention. The data included their risk for developing type 2 diabetes and changes in knowledge, intent and behaviour that could reduce their risk.

The detailed evaluation methodology and results are found in the "Diabetes Prevention Strategy 2009-2012: Evaluation Report" available at http://www.toronto.ca/health/diabetes/resources.htm.[16]

PROGRAM SUCCESSES

Based on the analysis of the evaluation data, the DPS was effective in reaching populations at high-risk of type 2 diabetes, influencing knowledge and promoting positive behaviour change in the areas of healthy eating and physical activity. The Peer Leadership Program showed great promise in the creation of sustainable programs that meet the needs of diverse ethno-cultural groups. The key successes and evaluation findings are presented below.

Community Mobilization and Partnerships

The community partnerships established between TPH, community health centres and other ethno-cultural community organizations were essential to the program's success.

Involvement of community partners in the early stages of planning, and throughout the course of the program, contributed to the development of interventions that took into account not only the health needs of high-risk populations but also barriers to program participation. The previously mentioned focus groups carried out in 2009 and DPS partners, helped to identify the barriers to program participation (e.g., family pressures, money, transportation, lack of time). The agencies also played an important leadership and coordination role in terms of program delivery in their communities, and contributed to data evaluation collection efforts.

The linkages established between programs and community agencies aimed to reduce the service gaps and contributed to easier access to diabetes prevention services for community residents (e.g., participants were referred to CHCs for follow up or existing community physical activity programs).

Program Reach

Between 2009 and 2012 the DPS program directly reached almost 8,000 at-risk individuals through health education, behaviour change and awareness raising activities (Table 1). In addition, an estimated 2 million people were reached through the DPS public awareness activities.

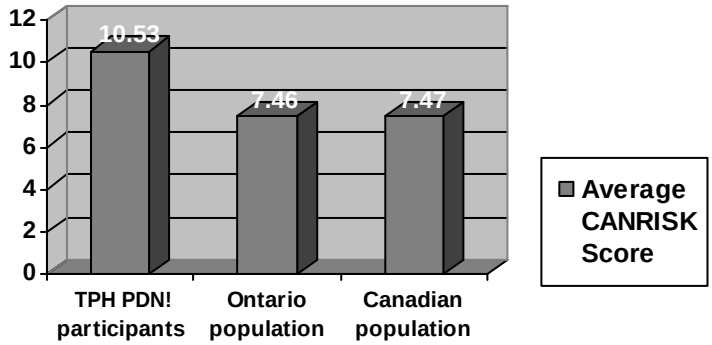
Table 1: Diabetes Prevention Strategy Activities – Reach*

DPS Activity	Number of Individuals Reached (Community and workplace settings)	Percent of Total Reach
Peer Leadership Program (Peer-led)	5686 through all peer-led activities (3124 through peer-led health education sessions)	71
Prevent Diabetes NOW! Workshop (TPH staff & outreach worker led)	1910	24
Healthy Eating Intervention (TPH staff-led)	98	1
Physical Activity Intervention (TPH staff-led)	238	3
Healthy Eating Active Living Intervention (TPH staff-led)	49	1

Note: * Excludes reach achieved through public awareness activities

Through the development of culturally appropriate, relevant and accessible interventions the DPS was successful in reaching significant numbers of individuals from at-risk populations for type 2 diabetes. Over 90% of individuals reached were from the high-risk ethnicities (e.g., South and East Asian, Black, Latin American, and Aboriginal). The average CANRISK score for PDN! participants (10.53) was approximately 40% higher than the average scores for both the Canadian (7.47) and Ontario (7.46) populations (Figure 1).[17] Based on the CANRISK scores, 41% of PDN! participants were identified as being at risk for developing type 2 diabetes.

Figure 1. CANRISK Scores -TPH PDN! Participants, Ontario and Canadian Populations



The Peer Leadership Program was especially effective, as it reached 71% or over 5600 of the total number of DPS program participants. The program also resulted in the expansion of the DPS activities with new high-risk communities and with populations to which TPH had limited access (i.e., Aboriginal). This expansion beyond the two pilot project communities would not have been possible to achieve to the same extent by TPH staff and/or outreach workers.

The success in reaching populations at high risk can be in part attributed to the fact that the peer leaders were members of the communities they served. The peer leaders had knowledge and understanding of the cultural contexts of community members, as well as the ability to deliver activities in the languages spoken in their community and in locations normally frequented by the community members.

Overall, the Peer Leadership Program component of the DPS significantly contributed to an enhanced capacity by TPH to provide health services, increased access to these services for high-risk communities, and accomplished it in a way that reduced cultural, educational, social and environmental barriers.

With respect to public awareness activities three media campaigns focused on raising awareness of the risk factors for type 2 diabetes. The vehicles for the activities included ethnic and community newspapers, public transit buses, elevators of high-rise apartment buildings, and information on TPH Diabetes Prevention web pages. The reach achieved through the various activities and the increases in numbers of visits to the TPH web pages during the campaigns, are provided in Table 2.

Table 2: Public Awareness Activities – Reach

Public Awareness Activity	Reach
Ethnic and Community papers (Total Circulation)	2,386,160
Public Transit Bus ads (Total Views)	4,738,000
Elevator ads (Total Apartment Units)	5400
TPH Diabetes Prevention web pages (Page Visits)	Prior to campaigns - 150/month
	During campaigns - 400/month

Behaviour Change & Reduced Risk for Type 2 Diabetes

The evaluation findings indicate that the DPS program components were effective in increasing knowledge of both the risk factors for type 2 diabetes and of the strategies for prevention of the disease in program participants. More importantly, the program was effective in increasing not only the intent to decrease the risk for type 2 diabetes, but also in influencing positive healthy eating and physical activity behaviours among program participants.

Over 190 Prevent Diabetes NOW! workshops were delivered by TPH staff and outreach workers over the three years of the project. The majority of workshop participants reported the following at the end of the single session workshop:

- 91% said they learned something new through the workshop; and
- 88% said they planned to do something to decrease their risk of developing type 2 diabetes.

Overall, DPS program participants reported making healthy changes to their eating habits, such as, eating more vegetables and fruit, eating more whole grains, choosing healthier types of fats, and decreasing salt in their diet. With respect to physical activity, program participants reported decreased sedentary behaviour, increased levels of physical activity, and increased establishment of physical activity routines.

More specifically, when completing the post intervention surveys at the end of the last session of the four or eight week healthy eating intervention led by TPH staff, 98% of participants reported the program influenced the way they ate. When asked what specific changes were made, the following responses were provided:

- 76% reported changes to what they eat (e.g., eating more vegetables and fruit, decreasing salt);
- 13% reported changes to food preparation (e.g., using less fats or oils); and
- 8% reported reading food labels.

Similarly, positive changes were reported by participants of the TPH staff-led multi-week physical activity program (nine weeks long). At the end of the program, on average:

- physical activity per week increased significantly by 33% or 202 minutes; and
- sedentary time per day significantly decreased by 18% or 57 minutes.

Positive behaviour changes were also reported by participants of the peer-led health education program (up to six sessions). The following were found at the end of the peer-led sessions:

- 69% percent of participants reported knowledge of risk factors for type 2 diabetes. An increase from 39% of participants at the start of the intervention;
- 74% of participants reported knowledge of strategies for prevention of type 2 diabetes. An increase from 48% of participants at the start of the intervention;
- 54% improved the kind of food they ate or the way they prepare food; and
- 51% improved their level of physical activity.

Almost all of the changes were statistically significant for both TPH staff-led and peer-led activities.

A follow up was carried out with program participants twelve-months after the program ended (PDN!, multi-week healthy eating and physical activity programs). The results indicated that the DPS had a potentially lasting effect on behaviour change. The findings show that 48% and 45% of respondents changed their eating and physical activity habits respectively, in the last twelve months. The most frequently reported changes for healthy eating were:

- eating more vegetables and fruit (24%);
- choosing lower fat products (12%); and
- consuming less sugar (12%).

The most frequently reported changes for physical activity were:

- walking more (30%); and
- exercising more (24%).

The respondents said that they made changes because they wanted to feel healthier, lose weight and prevent diabetes and/or illness.

Community Capacity Building

The training of peer leaders by TPH staff contributed to increased community capacity to address diabetes prevention and sustainability of the activities with high-risk populations in the community beyond the duration of the project.

As part of the Peer Leadership Program, peer leaders were provided with two and a half days of training, a Facilitator Guide and access to TPH staff for ongoing support. At the end of the training feedback was collected from the peer leaders and based on responses:

- 95% of peer leaders were able to identify risk factors for type 2 diabetes;
- 97% of peer leaders were able to identify strategies to prevent the disease;
- 87% of peer leaders reported increased confidence in their ability to deliver programming;
- 79% of peer leaders reported increased facilitation skills; and
- 99% of peer leaders were satisfied with program materials.

Feedback was also collected at the end of the Peer Leadership Program and at that time 93% of the peer leaders who responded commented that the training helped them to lead program activities. Both the peer leaders and their agency contacts reported that TPH staff supported them through the course of the program (71% and 94% respectively).

TPH's training, facilitation, program structure and funding were crucial to program implementation as half of the partner organizations indicated that they would not have provided this type of a program and over half (56%) would not have trained peer leaders without the supports. Almost 40% of the partner organizations viewed the development of capable peer leaders as a top benefit to their organization.
With respect to program sustainability, three quarters of partner organizations indicated that they would continue to offer type 2 diabetes prevention activities using peer leaders beyond the funding timeline for the project.

Details of the evaluation methodology and results can be found in the "Diabetes Prevention Strategy 2009-2012: Evaluation Report", available at http://www.toronto.ca/health/diabetes/resources.htm.[18]

Diabetes Prevention Strategy 2012-2013

While the initial DPS proposal was for a three-year pilot project, TPH was fortunate to receive a fourth year of funding from MOHLTC and had the opportunity to continue the DPS project activities to March 31, 2013. In keeping with the comprehensive approach, activities included awareness, education and skill building through an expanded Peer Leadership Program; TPH staff-led health education activities, a public awareness campaign and an initiative to increase access to healthy foods. At the time of the submission of this report data analysis for 2012-2013 activities was not yet available.
A larger focus for 2012-2013 was placed on the expansion of the Peer Leadership Program, which would not have been possible without the funding received from the MOHLTC. In the summer of 2012, 25 partner agencies across Toronto were identified to take part in the Peer Leadership Program (Attachment 1). In the Fall of 2012 TPH staff trained a total of 133 peer leaders from a number of cultural communities. The peer leaders implemented peer-led diabetes prevention activities in the community until March 31, 2013.

In an effort to enhance access to healthier foods DPS supported the Mobile Good Food Market (MGFM) pilot initiative; a collaborative project of the TPH led Food Strategy, FoodShare, United Way and the Food Policy Research Initiative. The DPS provided financial support for community outreach, capacity building and marketing efforts to increase the number of community members accessing the markets and the quantity of produce purchased. The MGFM operates in eight sites across the City of Toronto, in neighbourhoods with limited access to fresh produce. The markets offer a variety of vegetables and fruit at affordable prices. The preliminary evaluation results of the MGFM pilot demonstrate that the promotion and outreach efforts resulted in increased market attendance and sales, and will be used to help inform future MGFM activities and other food access initiatives. The MGFM partners are committed to continuing the project and seek sustainable funding to fully assess the effect of a mobile produce vending intervention on enhancing healthy food access.

A public awareness campaign, in March 2013, continued to build and expand on the diabetes prevention messages developed in the first three years of the pilot. Diabetes

prevention ads were placed in ethnic and local media, elevators of high-rise buildings in neighbourhoods with high rates of type 2 diabetes, and public transit bus shelters across Toronto.

The DPS three-year pilot project, in particular the Peer Leadership Program component, reached a substantial number of individuals at-risk for developing type 2 diabetes. The evaluation findings indicate that the DPS pilot was effective in significantly and positively influencing community members' knowledge and behaviour change in the areas of healthy eating and physical activity.

The Peer Leadership Program component resulted not only in community capacity building, but also in the expansion of the DPS activities with communities TPH would not be able to reach otherwise, all achieved through a very modest financial investment per participating community agency.

With respect to the workplace setting, health promotion programs such as the diabetes prevention initiative will continue to be promoted as part of a comprehensive workplace health approach and tailored in scope and intensity to meet the needs and capacity of each workplace. This approach has been working well over the past two years.

Given the effectiveness in positively influencing behaviour change, potential for sustainability in the community, and its ability to resonate well with culturally diverse communities TPH will continue to implement the peer leadership model in communities where the risk for type 2 diabetes remains high.

The recent MOHLTC three-year funding announcement will allow TPH to continue the Peer Leadership Program and expansion of the DPS to include initiatives that lead to increased access to healthy eating and physical activity opportunities. These efforts will contribute not only toward reducing the risk for type 2 diabetes, but also toward improvement of other health outcomes and reduction of health inequalities in populations most at risk and whose health risks are compounded by factors such as income, immigration status and ethno-racial background. Ongoing funding will allow TPH to continue providing programs that improve health for all residents.

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SIGNATURE

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ATTACHMENTS

Attachment 1 – Peer Leadership Program – List of Agencies

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