Key Performance Measures for the Ontario Diabetes Strategy Final Report

June 2013

Health Analytics Branch

Ontario

Ontario Ministry of Health and Long-Term Care
Health System Information Management and Investment Division
Health Analytics Branch

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The Health Analytics Branch (HAB), in the Ministry of Health and Long-Term Care, provides high quality information, analyses and methodological support to enhance evidence-based decision making in the health system. As part of the Health System Information Management and Investment (HSIMI) Division, HAB manages health analytics requests, identifies methods, and creates reports and tools to meet ministry, LHIN and other client needs for accurate, timely and useful information.
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Purpose of Report

The purpose of this report is to provide information on the key performance measures (indicators) for the Ontario Diabetes Strategy (ODS). Monitoring these indicators provides information on the progress of improving care and health outcomes for Ontarians with diabetes.

The report includes:

i) A brief description of the indicator selection and development;
ii) Information on each indicator using the most recently available data; and
iii) Technical specifications for each indicator.

The first key performance measures report was prepared and distributed in May 2010. The second and third reports were distributed in October 2010 and October 2011, respectively. **This is the fourth and final report and it provides updates for all performance measures except for the indicator, attached diabetes patients (See Box 1 on page 8 for more information).** Figure 1 shows the reporting time period for each of the 15 indicators in this and previous performance measures reports.

Figure 1: Point-in-time reported for each key performance indicator

	2008/09		2009/10				2010/11				2011/12				2012/13
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Prevalence					▷			▶			▶				◆
Physically inactive	▷				▶				▶				◆		
Overweight or obese	▷				▶				▶				◆		
Attached to family doctor					▷	▶			▶						
Registered with Health Care Connect						▷	▶				▶				◆
Diabetes management incentives					▷	▶				▶				◆	
HbA1c test in past six months					▷	▶		▶		▶				◆	
LDL-C test in past year					▷	▶		▶		▶				◆	
Retinal eye exam within past two years					▷	▶		▶		▶				◆	
All 3 tests within guideline periods					▷	▶		▶		▶				◆	
Emergency visits for hyper or hypoglycemia						▶				▶				◆	
Renal replacement therapy rate		▷								▶				◆	
Infections, ulcers, amputations rate		▷								▶				◆	
Heart attack (acute myocardial infarction) rate		▷								▶				◆	
Ocular procedure rates										▶				◆	

Key performance measure is current as of this time period:
▷ May 2010 report
▶ October 2010 report
▶ October 2011 report
◆ **June 2013 (current report)**

Development of Key Performance Measures

The Key Performance Measures for the Ontario Diabetes Strategy (ODS) were developed to enable the ministry to monitor progress in improving care and health outcomes for Ontarians with diabetes. To this end, the IM/IT Expert Reference Group of the Diabetes Expert Panel identified a core set of indicators that should be included in a diabetes registry. These indicators, along with a preliminary set of indicators approved by Cabinet, were reviewed by a sub-group of the Expert Panel[1] (see list in Appendix A) in terms of their importance, relevance and feasibility. The group also provided advice on technical specifications, suggested targets, and proposed new indicators. These recommendations were brought forward to the Expert Panel[2] for further discussion and approval. Several of the indicators were acknowledged as being crucial for monitoring diabetes care, but not feasible at the time because of lack of data. It was anticipated that a diabetes registry would eventually be the appropriate source for many of these measures, however due to delays the Diabetes Registry was cancelled by eHealth Ontario in September 2012. Progress in other ODS initiatives, such as the Baseline Diabetes Dataset Initiative, has since fulfilled many of the functional "value propositions" originally associated with the registry. The key performance measures are also described in Appendix A.

Subsequent to the discussions with the Expert Panel members, additional changes were made to the ODS Key Performance Measures. First, to round out the list, it was decided that population-based information on diabetes prevalence and risk factors should be monitored on a regular basis. Second, indicators which examine the use of the diabetes management codes were added to provide information on the clinical management of diabetes patients. Finally, amendments were made to the indicators which relate to clinical practice guidelines to ensure better alignment between the ODS measures and those that were being proposed by the Baseline Diabetes Dataset Initiative (BDDI)[3].

The resulting set of performance measures constitutes the ODS Key Performance Measures. These measures provide information on access to care for persons with diabetes, processes of diabetes care (i.e., clinical management of diabetes patients), as well as intermediate and long-term outcomes. For example, measures that look at whether, or the frequency with which tests such as HbA1c or LDL were done provide information about the quality of the process of care. As well, for example indicators that present the proportion of the diabetes population hospitalized for an acute myocardial infarction (AMI) provide information on outcomes of care (Kerr et al., 2004; National Quality Forum 2006; Nicolucci, Greenfield, Mattke et al., 2006). These intermediate and long-term outcome measures reflect overall health system performance. Unlike the process and intermediate care outcomes, these measures should not be related back to individual providers.

Following the distribution of the first performance measures report in May 2010, it was decided that 'Emergency visits for hyper or hypoglycemia' should be included as a key performance measure, and that indicators on ocular outcomes should be developed and included in future reporting. Table 1 lists the revised measures and shows how they align to the broad goals of the ODS.

Technical specifications for the calculation of each indicator are provided in Appendix B.

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[1] Meeting held July 8th, 2009.

[2] Meetings held August 12th and October 5th, 2009.

[3] The BDDI was developed by e-Health; the BDDI project team developed a set of measures (to be included in reports to physicians, LHINs and province) independently of the ODS Performance Measurement workgroup.

Table 1. Key Performance Measures for the Ontario Diabetes Strategy (ODS), population age 18+

Reduced risk and improved management / care coordination lead to decreased burden and better health outcomes

Outcome	OBJECTIVE		
	Reduce risk for diabetes	**Increase access to diabetes care**	**Improve management of diabetes**
Short –term	► Percent of Ontarians who are physically inactive ► Percent of Ontarians who are overweight or obese	► Percent of Ontarians with diabetes who have a family doctor ► Number of Ontarians with diabetes registered with Health Care Connect ► Number of Ontarians with diabetes referred by Health Care Connect to Family Health Care Providers	► Percent of Ontarians with diabetes for whom the Diabetes Management Incentive (Q040) was claimed in the past year ► Percent of Ontarians with diabetes for whom the Diabetes Management Assessment (K030) was claimed in the past year ► Percent of Ontarians with diabetes for whom any Diabetes Management code was claimed in the past year **Management of diabetes according to Clinical Practice Guidelines** ►Percent of Ontarians with diabetes who had: • HbA1c test in the past six months • LDL-C test in the past year • Retinal eye exam in the past two years • All three tests within the guideline periods
	Reduce diabetes burden	**Reduce complications of diabetes**	
Intermediate or long-term	► Prevalence of diabetes in the Ontario population	► Rate of emergency visits for high or low blood sugar levels (hyper or hypoglycemia) per 100,000 Ontarians with diabetes ► Rate of renal replacement therapy per 100,000 Ontarians with diabetes ► Hospitalization rates for infections, ulcers or amputations per 100,000 Ontarians with diabetes ► Hospitalization rates for heart attack (acute myocardial infarction) per 100,000 Ontarians with diabetes ► Rate of ocular procedures (vitrectomy & laser photocoagulation) per 100,000 Ontarians with diabetes	

Results

An indicator summary including reporting frequency, most recent available results and population targets (where applicable) is provided in Table 2. All indicators have been updated since the previous key performance report published in October 2011, unless noted in the box below. Any modifications made in this report are also provided in Box 1 below.

Detailed results for each indicator are shown in the pages that follow. These are provided at both the provincial and LHIN level (for the LHIN's population) and include historical trends where available. As well, the time periods of reporting and highlights for the findings are provided for each indicator. SubLHIN level analysis for two indicators (diabetes prevalence; all 3 tests completed within guideline periods) is provided in Appendix C. Unless otherwise stated, all analyses presented in this report are for the population age 18+.

Table 2: Overview of ODS performance measures and most recent results

Indicator	Reporting frequency	Current Results		Target
		Date	Result	
1 Diabetes prevalence in Ontario population	Annual	Apr 2012	10.2% 1,100,696	n/a
Modifiable Risk Factors for Diabetes				
2 Percent of Ontarians who are physically inactive	Annual	2011	48.2%	n/a
3 Percent of Ontarians who are overweight/obese	Annual	2011	52.1%	n/a
Measures of Access to Care				
4 Percent of Ontarians with diabetes who have a regular family doctor	Annual	Sep 2010	96.9%	
5 (a) Number of Ontarians with diabetes registered with Health Care Connect **(b) Number and percent of Ontarians with diabetes referred to Family Health Care Provider by Health Care Connect**	Annual	Jul 31, 2012	14,374 11,501 (80%)	n/a
Clinical Management Measures				
6 (a) Percent of Ontarians with diabetes for whom a Diabetes Management Incentive (Q040) code was submitted in the past year **(b) Percent of Ontarians with diabetes for whom a Diabetes Management Assessment (K030) code was claimed in the past year** **(c) Percent of Ontarians with diabetes for whom any Diabetes Management code was claimed in the past year**	Annual	Mar 31, 2012	28.8% 31.8% 40.6%	n/a
7 Percent of Ontarians with diabetes who received at least one HbA1c test in the past six months	Annual	Mar 31, 2012	56.9%	80%
8 Percent of Ontarians with diabetes who received an LDL-C test in past year	Annual	Mar 31, 2012	69.0%	80%
9 Percent of Ontarians with diabetes who received a retinal eye exam in the past two years	Annual	Mar 31, 2012	66.7%	80%
10 Percent of Ontarians with diabetes who received all three tests within the guideline periods	Annual	Mar 31, 2012	39.2%	80%

Indicator	Reporting frequency	Current Results		
		Date	Result	Target
Complications, Outcomes of Care				
11 Emergency visit rate for hyperglycemia or hypoglycemia among Ontarians with diabetes (per 100,000)	Annual	2011/12	991/100,000	n/a
12 Renal replacement therapy rate among Ontarians with diabetes (per 100,000)	Annual	2011/12	836/100,000	Maintain at current level
13 Hospitalization rate for infections, ulcers or amputations among Ontarians with diabetes (per 100,000)	Annual	2011/12	3,390/100,000	Reduce by 10%
14 Hospitalization rate for heart attacks among Ontarians with diabetes (per 100,000)	Annual	2011/12	1,018/100,000	Reduce by 10%
15 Ocular procedure rate (vitrectomy & laser photocoagulation) among Ontarians with diabetes (per 100,000)	Annual	2011/12	3,183/100,000	n/a

Box 1: Additions/Deletions and Modifications in this report:

- The methodology for calculating prevalence has been refined to capture all persons with diabetes at the start of each fiscal year (April 1). (See Appendix B for details). These fiscal year cohorts are then used as denominators for all performance indicators with the exception of those calculated from the Community Care Health Survey (CCHS) and the Health Care Connect Database (Indicators 2-5). In addition to providing more recent data, all previous numbers have been updated for comparability and consistency (Indicators 6-15).
- The indicator, attached diabetes patients, has not been updated due to changes in 2010 in the administration of the Primary Care Access Survey (PCAS). In addition, data collection for the PCAS ended on September 30, 2011 and a revised survey, the Health Care Experience Survey (HCES) was implemented in October 2012. However, sufficient data for more focused reporting will only be available late-2013 (Indicator 4).
- The Diabetes Management Incentive code now includes two recently introduced fee schedule codes, K045 (Diabetes management by a specialist) and K046 (Diabetes Team Management). These codes are included alongside codes Q040 and K030 in the indicator, 6c: Percentage of Ontarians with diabetes (age 18+) for which any diabetes management code was claimed within the past year. The two new codes are not reported separately due to their infancy and current volumes are low. (Indicator 6).
- A LHIN level trend column was added to all outcome indicators (Indicators 11-15), which compared the 2011/12 age-adjusted rate to the 2009/10 age-adjusted rate.
- Testing rates for confirmed and all diabetes patients have been removed since updates on diabetes patients have not been received as a result of the BDDI project completion.

1. Diabetes prevalence

Description:	**Number and percent of the Ontario population (age 18+) with diabetes (type 1 or type 2)**
Rationale:	Prevalence provides information on the existing burden of diabetes
Data Source:	Historical estimates: Ontario Diabetes Database (ODD), Institute for Clinical Evaluative Sciences (ICES). Current estimates: Baseline Diabetes Dataset Initiative (BDDI), MOHLTC
Target:	Not applicable

Provincial results

Table 1.1: Diabetes prevalence among Ontario adults (age 18+) per 100 population, 2002/03 to April 2012

	Time period	#	%
ICES - historical	2002/03	694,330	7.5
	2003/04	743,639	7.9
	2004/05	799,953	8.3
	2005/06	865,760	8.9
	2006/07	938,768	9.5
	2007/08	999,442	10.0
BDDI	Apr 2008	857,810	8.4
	Apr 2009	911,637	8.8
	Apr 2010	979,898	9.3
	Apr 2011	**1,042,450**	**9.8**
	Apr 2012	**1,100,696**	**10.2**

- As of April 2012, there are 1,100,696 Ontarians with diabetes (age 18+); this represents a 28.3% increase (242,886 Ontarians) compared to April 2008.
- The growing prevalence may be due to more newly diagnosed cases and/or persons with diabetes living longer (Hux and Tang, 2003).
- The historical diabetes prevalence numbers from ICES are based on analysis of administrative data that identified probable diabetes patients using a validated algorithm. They are provided for reference and should not be compared directly with prevalence numbers/rates based on BDDI.
- BDDI prevalence numbers were refined based on physicians' review of their list of diabetes patients in 2010. Administrative data and a previously validated algorithms developed by ICES were used to identify all potential adults in Ontario with diabetes. Patient lists were sent for validation to all Primary Care Providers (PCP) to **confirm** whether those identified by the algorithm did have diabetes, and to allow PCPs to identify any patients with diabetes who may have been missed (i.e., **add new patients**). The feedback from PCPs was used to establish a more refined prevalence estimate than previously available. BDDI prevalence estimates continued to be revised and updated with each iteration of the BDDI process until the project closed in November 2012. The BDDI algorithm is current as of April 1, 2012. See Appendix B for details.

LHIN results

Table 1.2: Diabetes prevalence number and rates (per 100 population age 18+) by LHIN, April 2010 to April 2012

	As of Apr 2010		As of Apr 2011		As of Apr 2012		Change in % points 2010 vs. 2012
LHIN	**#**	**%**	**#**	**%**	**#**	**%**	
Erie St. Clair	51,242	10.1%	54,321	10.7%	57,043	11.1%	1.1%
South West	67,964	9.0%	72,114	9.4%	76,015	9.8%	0.9%
Waterloo Wellington	46,324	**7.9%**	49,632	**8.3%**	52,636	**8.7%**	0.8%
HNHB	103,843	9.2%	109,560	9.6%	114,894	10.0%	0.7%
Central West	68,582	10.9%	73,948	11.6%	79,175	12.2%	**1.3%**
Mississauga Halton	78,464	8.7%	84,056	9.1%	89,460	9.5%	0.8%
Toronto Central	80,106	8.6%	84,790	9.0%	89,216	9.5%	0.9%
Central	124,858	9.0%	133,766	9.4%	142,535	9.7%	0.8%
Central East	128,569	10.2%	136,701	10.6%	143,758	10.9%	0.7%
South East	38,683	9.7%	41,228	10.2%	43,311	10.6%	1.0%
Champlain	83,817	8.4%	88,949	8.8%	93,661	9.1%	**0.7%**
North Simcoe Muskoka	30,356	8.3%	32,382	8.7%	34,307	9.1%	0.8%
North East	53,833	**11.7%**	56,760	**12.3%**	59,040	**12.8%**	1.1%
North West	21,220	11.3%	22,558	11.9%	23,783	12.5%	1.2%
LHIN unknown	2,037		1,685		1,862		
ONTARIO	979,898	9.3%	1,042,450	9.8%	1,100,696	10.2%	0.8%

The lowest and highest percentages are bolded.

- As of April 2012, diabetes prevalence varies across LHINs from 8.7% in the Waterloo Wellington LHIN to 12.8% in the North East LHIN.
- Since April 2010, diabetes prevalence has been increasing in all LHINs, increases ranging from 0.7% (Champlain) to 1.3% (Central West).
- There is considerable variation in diabetes prevalence within LHIN areas as well as between LHIN areas. SubLHIN areas are geographic areas below the scale of LHINs. They are defined by the individual LHINs for their local planning purposes. SubLHIN area prevalence rates range from 5.7% to 18.9% (see Figures 1.1 &1.2).
- Figure 1.2 shows diabetes prevalence, per 100 population age 18+ by subLHIN area. The highest prevalence rates are seen in seen in parts of Hamilton Niagara Haldimand Brant, Central West, South East North West and North East LHINs.

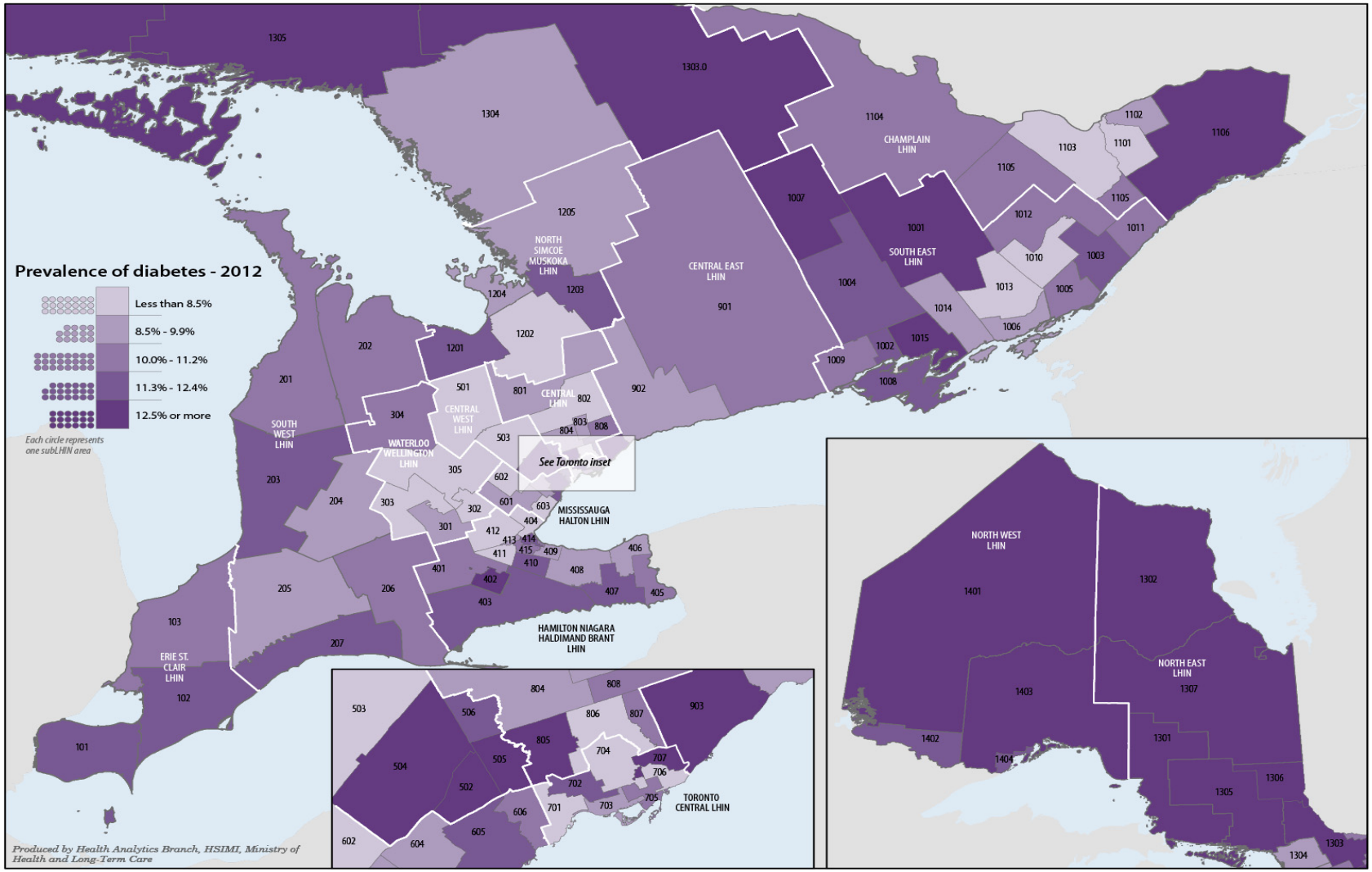
Figure 1.1: Histogram for Diabetes prevalence rates (per 100 population age 18+) by subLHIN as of April 1, 2012

LHIN, subLHIN		Prevalence rate
Erie St. Clair LHIN		
101	Essex	11.4
102	Chatham-Kent	12.0
103	Lambton	10.1
South West LHIN		
201	Bruce	10.7
202	Grey	10.4
203	Huron	11.6
204	Perth	9.0
205	Middlesex	9.2
206	Oxford-Norfolk	10.9
207	Elgin	11.5
Waterloo Wellington LHIN		
301	Urban Waterloo & Rural Waterloo South	9.2
302	Urban Guelph	8.2
303	Rural Waterloo	8.3
304	Rural-South Grey and North Wellington	11.0
305	Rural Wellington	6.8
Hamilton Niagara Haldimand Brant LHIN		
401	Brant and Brantford	10.8
402	New Credit and Six Nations	18.9
403	Haldimand and Norfolk	12.4
404	Burlington	7.7
405	East Niagara	11.1
406	North Niagara	10.0
407	South Niagara	11.3
408	West Niagara	9.1
409	Stoney Creek	9.8
410	Glanbrook	11.9
411	Ancaster	7.9
412	Flamborough	5.7
413	Dundas	8.7
414	Hamilton Urban Core	11.9
415	Hamilton Outer Core	10.6
Central West LHIN		
501	Dufferin County	7.3
502	Malton (Mississauga)	16.2
503	Caledon	6.5
504	Brampton	12.8
505	Rexdale (Toronto)	14.5
506	Woodbridge (Vaughan)	11.9
Mississauga Halton LHIN		
601	Milton	10.0
602	Halton Hills	8.2
603	Oakville	7.7
604	Northwest Mississauga	8.4
605	Southeast Mississauga	11.8
606	South Etobicoke-Toronto	10.7
Toronto Central LHIN		
701	West	8.1
702	North West	11.5
703	South West	9.8
704	North Toronto	6.7
705	South East	10.3
706	East	8.4
707	North East	12.4

LHIN, subLHIN		Prevalence rate
Central LHIN		
801	South Simcoe & Northern York Region	9.3
802	Central York Region	8.2
803	Richmond Hill	9.1
804	South West York Region	10.0
805	North York West	13.6
806	North York Central	8.3
807	North York East	10.7
808	Markham	10.3
Central East LHIN		
901	North East Cluster	10.6
902	Durham Cluster	9.7
903	Scarborough Cluster	12.7
South East LHIN		
1001	Addington, N&C Frontenac	13.4
1002	Belleville	11.9
1003	Brockville	12.0
1004	Central Hastings	12.4
1005	Gananoque, Leeds	11.0
1006	Kingston & Islands	9.3
1007	North Hastings	15.7
1008	Prince Edward County	11.3
1009	Quinte West, Brighton	10.9
1010	Rideau Lakes	6.9
1011	SE Leeds & Grenville	11.0
1012	Smiths Falls, Perth, Lanark	11.2
1013	South Frontenac	7.9
1014	Stone Mills, Loyalist	10.0
1015	Tyendinaga, Napanee	13.3
Champlain LHIN		
1101	Ottawa Centre	7.7
1102	Ottawa East	9.6
1103	Ottawa West	8.1
1104	Renfrew County	10.2
1105	North Lanark / North Grenville	10.1
1106	Eastern Counties	12.6
North Simcoe Muskoka LHIN		
1201	Collingwood and Area	11.4
1202	Barrie and Area	8.3
1203	Orillia and Area	11.5
1204	Midland and Penetanguishene Area	8.7
1205	Muskoka	10.0
North East LHIN		
1301	Algoma	13.3
1302	James and Hudson Bay Coasts	*data not shown*
1303	Nipissing	12.5
1304	Parry Sound	9.5
1305	Manitoulin-Sudbury	12.9
1306	Timiskaming	13.3
1307	Cochrane	12.8
North West LHIN		
1401	Kenora	14.0
1402	Rainy River	11.5
1403	Thunder Bay District	13.1
1404	Thunder Bay City	11.5

Figure 1.2: Diabetes prevalence rates, population age 18+, by subLHIN area, April 2012

LHIN boundaries are shown in white. SubLHINs with higher prevalence of diabetes are shown as darker colours. Lower prevalence areas are shown in lighter shading.



2. Physical inactivity

Description:	**Percent of Ontarians (age 18+) who are physically inactive**
Rationale:	Physical inactivity is an independent risk factor for diabetes. Research strongly supports the benefits of physical activity in the prevention of type 2 diabetes. There is also reasonable evidence to suggest physical inactivity contributes to excess weight (which in turn contributes to diabetes). In Ontario, approximately 16% of all type 2 diabetes cases can be attributed to physical inactivity (Health System Intelligence Project/MOHLTC 2006; Ezzati, Lopez, Rodgers and Murray 2004). The burden of diabetes could be reduced substantially if physically inactive adults became moderately active.
Data Source:	Canadian Community Health Survey, Statistics Canada
Target:	Not applicable

Provincial results

Table 2.1: Percent of Ontarians (age 18+) who are physically inactive, 2003-2004 to 2011

Time period[a]	%	95% CI[b]
2003 - 2004	50.8	50.0 - 51.6
2005 - 2006	49.4	48.5 - 50.2
2007	52.5	51.3 - 53.6
2008	52.6	51.4 - 53.7
2009	51.2	50.0 - 52.4
2010	51.0	49.6 - 52.4
2011	**48.2**	**46.9 – 49.6**

a. The Canadian Community Health Survey collected and released data in biannual cycles from 2001-2006; starting in 2007 data are available annually.
b. The confidence interval indicates the degree of variability associated with an estimate; 95% confidence interval includes the estimate within its upper and lower bounds 19 times out of 20.

- In 2011, just under half (48.2%) of the Ontario adult (age 18+) population were physically inactive.
- Between 2003-04 and 2011, the proportion of physically inactive adults has fluctuated within four percentage points, with the proportion being lowest (showing improvement) in 2011.

LHIN results

Table 2.2: Percent of adults (age 18+) who are physically inactive, by LHIN, 2008 to 2011

LHIN	Time period				Change in % points 2008 vs. 2011
	2008	2009	2010	2011	
	% (95% CI)[a]	% (95% CI)	% (95% CI)	% (95% CI)	
Erie St. Clair	56.2 (52.3 - 60.1)	53.1 (48.7 - 57.6)	51.3 (46.6-56.0)	52.2 (47.6-56.8)	-4.0
South West	50.6 (47.3 - 53.9)	52.6 (49.3 - 55.9)	49.5 (45.8-53.2)	47.3 (43.4-51.2)	-3.3
Waterloo Wellington	53.7 (49.7 - 57.7)	52.1 (46.9 - 57.2)	44.6 (40.4-48.7)	46.6 (42.1-51.1)	-7.1
HNHB	49.4 (46.4 - 52.4)	47.2 (44.0 - 50.4)	49.4 (45.0-53.7)	44.6 (40.6-48.6)	-4.8
Central West	**64.4** (58.9 - 69.9)	**62.8** (58.2 - 67.4)	**62.6** (57.6-67.6)	**57.6 (52.8-62.4)**	-6.8
Mississauga Halton	53.9 (49.4 - 58.3)	50.8 (45.8 - 55.7)	51.3 (45.1-57.5)	49.6 (43.6-55.6)	-4.3
Toronto Central	52.1 (47.6 - 56.6)	52.3 (47.5 - 57.1)	52.6 (46.7-58.5)	43.4 (38.3-48.5)	-8.7
Central	57.4 (53.3 - 61.4)	55.2 (50.6 - 59.9)	56.3 (51.2-61.4)	55.3 (50.8-59.8)	-2.1
Central East	56.5 (52.2 - 60.7)	56.4 (52.3 - 60.5)	56.5 (52.2-60.8)	52.9 (48.4-57.4)	-3.6
South East	46.6 (43.0 - 50.2)	43.3 (38.8 - 47.7)	**40.7** (36.2-45.2)	43.9 (39.2-48.7)	-2.7
Champlain	43.2 (39.0 - 47.4)	42.9 (38.7 - 47.0)	44.4 (40.4-48.3)	40.1 (36.1-44.1)	-3.1
North Simcoe Muskoka	48.1 (43.2 - 53.1)	42.6 (37.1 - 48.1)	44.3 (37.1-51.4)	**37.0 (31.6-42.4)**	-11.1
North East	47.9 (44.7 - 51.0)	46.8 (43.3 - 50.3)	43.9 (40.3-47.5)	45.9 (42.1-49.8)	-2.0
North West	**41.6** (37.5 - 45.8)	**41.1** (36.3 - 45.9)	44.2 (39.2-49.2)	38.6 (32.9-44.3)	-3.0
ONTARIO	56.2 (52.3 - 60.1)	53.1 (48.7 - 57.6)	51.3 (46.6-56.0)	48.2 (46.9-49.6)	-8.0

a. The confidence interval indicates the degree of variability associated with an estimate - 95% confidence interval includes the estimate within its upper and lower bounds 19 times out of 20.

The lowest and highest percentages are bolded.

- In 2011, in all LHINs, at least 3 out of 10 adults (age 18+) were physically inactive; the proportion was highest in the Central West LHIN (57.6%) and lowest in the North Simcoe Muskoka LHIN (37%).
- From 2008 to 2011, the proportion of physically inactive adults decreased (i.e., showed improvement) in all LHINs. The largest improvement was seen among residents in North Simcoe Muskoka LHIN.

3. Overweight / Obesity

Description:	**Percent of Ontarians (age 18+) who are overweight or obese**
Rationale:	Excess weight (determined by elevated levels of Body Mass Index (BMI)) is strongly related to an increased risk of type 2 diabetes. In Ontario, over 50% of type 2 diabetes can be attributed to obesity and an additional 27% can be attributed to overweight (Health System Intelligence Project/MOHLTC 2006; Ezzati, Lopez, Rodgers and Murray 2004).
Data Source:	Canadian Community Health Survey, Statistics Canada
Target:	Not applicable

Provincial results

Table 3.1: Percent of Ontarians (age 18+) who are overweight or obese, 2003-2004 to 2011

Time period[a]	%	95% CI[b]
2003 - 2004	49.6	48.8 - 50.4
2005 - 2006	49.8	49.0 - 50.7
2007	51.8	50.7 - 52.8
2008	51.8	50.5 - 53.0
2009	51.7	50.4 - 52.9
2010	53.0	51.6 - 54.4
2011	**52.1**	**50.7 – 53.5**

a. The Canadian Community Health Survey collected and released data in biannual cycles from 2001-2006; starting in 2007 data are available annually.
b. The confidence interval indicates the degree of variability associated with an estimate; 95% confidence interval includes the estimate within its upper and lower bounds 19 times out of 20.

- In 2011, over half (52.1%) of Ontarians (age 18+) were overweight (BMI of 25.0-29.9 kg/m^2) or obese (BMI=30.0 kg/m2 or more).
- The proportion of adults who are overweight/obese has increased from 49.6% to 52.1%since 2003-04.

LHIN results

Table 3.2: Percent of Ontarians (age 18+) who are overweight or obese by LHIN, 2008 to 2011

LHIN	Time period				Change in % points 2008 vs. 2011
	2008	2009	2010	2011	
	% (95% CI)[a]	% (95% CI)	% (95% CI)	% (95% CI)	
Erie St. Clair	57.7 (54.0 - 61.4)	61.9 (58.6 - 65.3)	62.1 (57.7 - 66.5)	58.8 (53.8-63.7)	1.1
South West	56.0 (53.0 - 59.0)	56.7 (53.4 - 59.9)	55.2 (51.5 - 59.0)	55.5 (51.6-59.3)	-0.5
Waterloo Wellington	53.9 (49.7 - 58.0)	54.2 (49.5 - 58.9)	51.2 (46.6 - 55.8)	54.0 (49.2-58.8)	0.1
HNHB	59.7 (56.9 - 62.4)	56.4 (53.2 - 59.6)	56.5 (52.7 - 60.3)	58.1 (55.0-61.2)	-1.6
Central West	**51.4 (45.7 - 57.1)**	**51.0 (45.7 - 56.3)**	**52.9 (47.4 - 58.4)**	52.2 (46.5-57.9)	0.8
Mississauga Halton	49.7 (45.2 - 54.3)	45.4 (40.9 - 50.0)	51.3 (46.1 - 56.5)	47.3 (41.6-53.0)	-2.4
Toronto Central	41.8 (36.9 - 46.6)	37.3 (32.3 - 42.4)	38.0 (33.1 - 42.9)	**44.1 (38.3-50.0)**	2.3
Central	43.3 (38.7 - 47.8)	47.8 (43.5 - 52.0)	47.7 (43.1 - 52.3)	48.2 (42.9-53.4)	4.9
Central East	49.4 (45.5 - 53.3)	48.7 (44.5 - 52.9)	56.7 (51.6 - 61.8)	51.7 (47.1-56.4)	2.3
South East	55.9 (52.3 - 59.6)	61.7 (56.9 - 66.5)	**55.3 (51.0 - 59.5)**	53.8 (49.0-58.6)	-2.1
Champlain	51.1 (47.1 - 55.0)	52.0 (48.2 - 55.9)	55.8 (52.1 - 59.5)	48.4 (44.6-52.2)	-2.7
North Simcoe Muskoka	57.3 (53.2 - 61.4)	55.9 (50.9 - 60.9)	57.4 (52.0 - 62.9)	58.9 (54.2-63.6)	1.6
North East	61.2 (58.2 - 64.2)	65.0 (61.7 - 68.2)	58.3 (53.9 - 62.6)	57.7 (53.5-61.8)	-3.5
North West	**59.7 (55.3 - 64.1)**	**59.9 (56.0 - 63.9)**	61.7 (57.4 - 66.1)	**64.5 (59.5-69.4)**	4.8
ONTARIO	51.8 (50.5 - 53.0)	51.7 (50.4 - 52.9)	53.0 (51.6 - 54.4)	52.1 (50.7-53.5)	0.3

a. The confidence interval indicates the degree of variability associated with an estimate - 95% confidence interval includes the estimate within its upper and lower bounds 19 times out of 20.

The lowest and highest percentages are bolded.

- In 2011, in all LHINs (with the exception of the Mississauga Halton, Toronto Central, Central and Champlain LHINs), at least half of the adults were either overweight or obese. The proportion was highest in the North West LHINs (64.5%) and lowest in the Toronto Central LHIN (44.1%).
- Since 2008, the proportion of overweight or obese adults has increased in eight LHINs. The largest increase is in the Central and North West LHINs (increase of 4.9 and 4.8 percentage points, respectively).

4. Attached diabetes patients

Description:	**Percent of Ontarians (age 18+) with diabetes who are attached (i.e., have a family doctor)**
Rationale:	People with diabetes who do not have access to a family physician can be less likely to seek education and counseling aimed at helping them manage their condition more effectively compared to those who receive primary care (Shah and Booth 2009).
Data Source:	Primary Care Access Survey (PCAS), MOHLTC

Provincial results

Table 4.1: Percent of Ontarians (age 18+) who have family doctors, Jan 2008 to Sep 2010

	All Ontarians	Ontarians with diabetes
Time period[a]	**% (95% CI)[a]**	**% (95% CI)**
January 2008 – December 2008	92.9 (92.2 - 93.6)	96.4 (94.8 - 98.0)
April 2008 – March 2009	93.2 (92.5 - 93.9)	96.7 (95.3 - 98.2)
July 2008 – June 2009	93.2 (92.5 - 93.9)	96.8 (95.4 - 98.1)
October 2008 – September 2009	93.3 (92.6 - 94.0)	97.2 (95.9 - 98.4)
January 2009 – December 2009	93.1 (92.3 - 93.8)	97.6 (96.5 - 98.7)
April 2009 – March 2010	93.4 (92.6 - 94.1)	96.4 (94.4 - 98.4)
July 2009 – June 2010	93.5 (92.7 - 94.2)	96.7 (95.0 - 98.4)
October 2009 - September 2010	93.2 (92.4 - 93.9)	96.9 (95.2 - 98.6)

a. PCAS collects data quarterly. To increase the precision of estimates, four consecutive quarters are combined to create a rolling year.
b. The confidence interval indicates the degree of variability associated with an estimate. A 95% confidence interval includes the estimate within its upper and lower bounds 19 times out of 20.

- As of September 2010, 97% of Ontarians (age 18+) with diabetes had a family doctor; therefore, the attachment rate remained high.
- From January 2008 to September 2010, the attachment rate was consistently higher (3.0% - 4.5%) among those with diabetes than in the overall population.

LHIN results

The sample size is insufficient to calculate the LHIN estimates.

5a. Diabetes patients registered with Health Care Connect

5b. Diabetes patients referred to family health care providers by Health Care Connect

Description:	**5a: Number of Ontarians with diabetes registered with Health Care Connect from inception in February 2009** **5b: Number and percent of Ontarians with diabetes registered with Health Care Connect who have been referred to Family Health Care Providers from inception in February 2009**
Rationale:	People with diabetes who do not have access to a family physician can be less likely to seek education and counseling aimed at helping them manage their condition more effectively compared to those who receive primary care (Shah and Booth, 2009).
Data Source:	Health Care Connect Database, MOHLTC
Target:	Not applicable

Provincial results

Table 5.1: Ontarians (age 18+) with diabetes registered and referred by Health Care Connect, February 2009 to July 31, 2012

		As of June 30, 2010	As of July 31, 2011	As of July 31, 2012
Registered	#	4,768	10,335	**14,374**
Referred	**#**	2,852	6,510	**11,501**
	%	59.8%	63.0%	**80.0%**

- As of July 31, 2012, a total of 14,374 Ontarians (age 18+) with diabetes have been registered with Health Care Connect (HCC), and 80% of all persons with diabetes registered with HCC had been referred to a family health care provider.
- Between June 30, 2010 and July 31, 2012, an additional 9,606 Ontarians (age 18+) with diabetes have been registered with HCC, and an additional 8,649 have been referred to a family health care provider.

LHIN results

Table 5.2: Ontarians (age 18+) with diabetes registered and referred by Health Care Connect, by LHIN, February 2009 to July 31, 2012

	As of June 30, 2010			As of July 31, 2011			As of July 31, 2012		
	Registered	Referred		Registered	Referred		Registered	Referred	
LHIN	**#**	**#**	**%**	**#**	**#**	**%**	**#**	**#**	**%**
Erie St. Clair	256	221	86.3	583	532	91.3	920	871	94.7
South West	558	447	80.1	955	713	74.7	1,509	1,296	85.9
Waterloo Wellington	151	102	67.5	365	227	62.2	499	333	66.7
HNHB	161	124	77	371	345	93	609	596	**97.9**
Central West	139	112	80.6	315	304	96.5	491	476	96.9
Mississauga Halton	**82**	71	86.6	**153**	125	81.7	**226**	214	94.7
Toronto Central	119	**58**	48.7	254	**120**	47.2	319	**206**	64.6
Central	180	129	71.7	387	318	82.2	604	580	96.0
Central East	560	326	58.2	1308	820	62.7	1,573	1,338	85.1
South East	392	374	**95.4**	738	668	**90.5**	1,132	1,056	93.3
Champlain	580	223	38.4	1172	567	48.4	1,450	987	68.1
North Simcoe Muskoka	243	97	39.9	750	332	44.3	1,131	1,012	89.5
North East	**1,122**	**507**	45.2	**2,467**	**1261**	51.1	**3,217**	**2,251**	70.0
North West	183	45	**24.6**	443	152	**34.3**	627	226	**36.0**
ONTARIO[a]	4,768	2,852	59.8	10,335	6,510	63	14,374	11,501	80.0

a. Ontario totals include patients with unknown LHINs.

The lowest and highest percentages are bolded.

- The number of Ontarians (age 18+) with diabetes who have registered with HCC since the inception of the program in February 2009 differs greatly across LHIN areas ranging from 226 (Mississauga Halton LHIN) to 3,217 (North East LHIN).
- Similarly, the number of registered diabetes patients who have been referred to a family health care provider since the inception of HCC ranges from 206 (Toronto Central LHIN) to 2,251 (North East LHIN).

6a.Utilization of Diabetes Management Incentive code (Q040)
6b.Utilization of Diabetes Management Assessment code (K030)
6c. Utilization of any Diabetes Management code

Description:	**6a: Percent of Ontarians (age 18+) with diabetes for whom a Diabetes Management Incentive code (Q040) was claimed in the past year** **6b: Percent of Ontarians (age 18+) with diabetes for whom a Diabetes Management Assessment (K030) code was claimed in the past year** **6c: Percent of Ontarians (age 18+) with diabetes for whom any Diabetes Management code was claimed in the past year**
Rationale:	Monitoring the use of the diabetes management incentive and assessment codes provides some information on the number and proportion of diabetes patients for whom coordinated care is being documented.
Data Source:	Baseline Diabetes Dataset Initiative (BDDI), MOHLTC
Target:	Not applicable

Provincial results

Table 6.1: Number and percentage of Ontarians with diabetes (age 18+) for whom Diabetes Management (Q040), Diabetes Assessment (K030) or any Diabetes Management code was claimed at least once within the past year

	Baseline Diabetes population[a]	Diabetes population 2009/10[b]	Diabetes population 2010/11[b]	Diabetes population 2011/12[b]
	Jan 1, 2009-Dec 31, 2009	Apr 1, 2009-Mar 31, 2010	Apr 1, 2010-Mar 31, 2011	Apr 1, 2011–Mar 31, 2012
Code	%	%	%	%
Q040[c]	25.5	26.5	28.6	**28.8**
K030[d]	27.5	27.9	31.0	**31.8**
Any Management Code[e]	35.9	36.3	40.1	**40.6**

a. Baseline Diabetes population. Refer to Appendix B for details.
b. Diabetes populations. Refer to Appendix B for details.
c. Q040 can be claimed for a diabetes patient once during a 12 month period. As of April 2009, all family physicians can claim Q040.
d. K030 can be claimed for a diabetes patient a maximum of 4 times during a 12 month period.
e. Any Diabetes Management code includes Q040 and K030 as well as two new management codes, K045 (Specialist) and K046 (Team), which were introduced in October 2010 and September 2011, respectively.

- Between April 1, 2011 and March 31, 2012, Q040 and K030 were claimed for 28.8% and 31.8% of Ontarians (age 18+) with diabetes, respectively. This is an increase of over 3% and over 4%, respectively, since the January 1, 2009-December 31, 2009 period.
- The proportion for whom any diabetes management code was claimed between April 1, 2011 and March 31, 2012 was 40.6%; an increase of almost 5% since January 1, 2009 period.

LHIN results

Table 6.2: Percentage of Ontarians with diabetes (age 18+) for whom Diabetes Management (Q040), Diabetes Assessment (K030) and any Diabetes Management code was claimed within the past year by LHIN

	Baseline Diabetes population			Diabetes population 2009/10			Diabetes population 2010/11			Diabetes population 2011/12			Change in % points for any Mgmt code[c] Baseline vs. 2011
	Jan 1, 2009 - Dec 31, 2009			Apr 1, 2009 - Mar 31, 2010			Apr 1, 2010 - Mar 31, 2011			Apr 1, 2011 – Mar 31, 2012			
LHIN	Q040[a]	K030[b]	Any Mgmt code[c]	Q040[a]	K030[b]	Any Mgmt code[c]	Q040[a]	K030[b]	Any Mgmt code[c]	Q040[a]	K030[b]	Any Mgmt code[c]	
Erie St. Clair	26.1	32.0	37.4	26.7	31.9	37.5	27.4	34.7	40.8	26.5	32.0	38.2	0.8
South West	33.0	40.6	47.6	34.5	41.5	48.3	37.4	**44.5**	**52.0**	36.0	43.6	50.9	3.3
Waterloo Wellington	35.7	**44.2**	**51.0**	36.4	**43.6**	**50.6**	38.4	44.5	51.9	34.7	**43.7**	51.4	0.4
HNHB	27.9	32.4	40.7	29.3	32.1	40.5	30.6	34.0	43.2	31.0	34.2	43.3	2.6
Central West	19.5	18.8	26.9	20.1	19.7	27.9	22.4	23.6	32.8	23.1	25.9	34.1	7.2
Mississauga Halton	22.1	25.2	32.7	23.0	26.0	33.3	25.0	28.5	36.0	24.7	28.9	36.7	4.0
Toronto Central	**17.1**	18.2	25.3	**17.9**	18.7	26.1	**20.2**	22.2	30.8	21.4	24.2	32.3	7.0
Central	22.1	18.7	29.0	23.7	19.4	29.9	26.3	23.8	35.5	27.3	26.4	37.4	8.4
Central East	23.5	24.9	33.0	24.5	25.6	33.8	26.7	29.8	38.2	27.8	32.2	40.2	7.2
South East	**36.5**	39.3	48.3	**38.1**	39.8	49.4	**38.8**	41.5	51.7	**38.4**	41.8	**52.1**	3.8
Champlain	25.3	24.8	34.6	25.2	25.3	34.3	27.5	27.8	38.2	28.7	28.7	38.4	3.8
North Simcoe Muskoka	29.8	39.4	46.1	30.8	39.1	45.4	34.4	42.5	50.2	35.1	40.9	48.9	2.8
North East	32.3	31.1	43.2	34.1	31.0	43.9	36.3	35.1	47.4	35.9	33.5	46.3	3.1
North West	18.0	**16.5**	**24.7**	18.9	**16.8**	**25.0**	20.2	**19.3**	**27.4**	**19.9**	**20.2**	**26.5**	1.8
LHIN unknown	27.0	26.6	36.7	20.3	20.5	27.7	24.0	26.6	34.6	25.9	29.6	37.9	1.2
ONTARIO	25.5	27.5	35.9	26.5	27.9	36.3	28.6	31.0	40.1	28.8	31.8	40.6	4.7

a. Q040 can be claimed for a diabetes patient once during a 12 month period. As of April 2009, all family physicians can claim Q040.
b. K030, K045 and K046 can be claimed for a diabetes patient a maximum of 4 times during a 12 month period.
c. Any Diabetes Management code includes Q040 and K030 as well as two new management codes, K045 (Specialist) and K046 (Team), which were introduced in October 2010 and September 2011, respectively.
The lowest and highest percentages are bolded.

- Between April 1, 2011-March 31, 2012, the proportion of Ontarians (age 18+) with diabetes for whom:
  - Q040 was claimed ranged from 19.9% (North West LHIN) to 38.4% (South East LHIN);
  - K030 was claimed ranged from 20.2% (North West LHIN) to 43.7% (Waterloo Wellington LHIN);
  - Any diabetes management code was claimed ranged from 26.5% (North West LHIN) to 52.1% (South East LHIN).

- Compared to January 1-December 31, 2009, the proportion of Ontarians with diabetes between April 2011-March 31, 2012:
  - increased across all LHINs for Q040 claims (except for Waterloo Wellington);
  - increased across all LHINs for K030 claims; and
  - increased across all LHINS for any management codes.

7. Haemoglobin A1c (HbA1c) testing frequency

Description:	**Percent of Ontarians (age 18+) with diabetes who received at least one HbA1c test in the past six months**
Rationale:	Glycated or glycosylated hemoglobin (HbA1c) is a reliable estimate of the mean plasma (blood) glucose levels in most individuals. Regular testing of blood glucose is important in diabetes management. According to the Canadian Diabetes Association's guidelines, "For most individuals with diabetes, A1C should be measured every 3 months to ensure that glycemic goals are being met or maintained. Testing at least every 6 months may be considered in adults during periods of treatment and lifestyle stability when glycemic targets have been consistently achieved *[Grade D, Consensus]*" (Pg. S34, Clinical Practice Guidelines for Diabetes, Canadian Diabetes Association 2008).
Data Source:	Baseline Diabetes Dataset Initiative (BDDI), MOHLTC
Target:	**80%**

Provincial results

Table 7.1: Number and percentage of Ontarians with diabetes (age 18+) receiving at least one HbA1c test during a six-month period, Baseline to Mar 31, 2012

	Time period	#	%
Baseline Diabetes Population[a]	July 1, 2009 - Dec 31, 2009	540,014	56.2
Diabetes Patients as of April 1, 2010	Oct 1, 2009 - Mar 31, 2010	556,894	56.8
Diabetes Patients as of April 1, 2011	Oct 1, 2010 - Mar 31, 2011	592,047	56.8
Diabetes Patients as of April 1, 2012	**Oct 1, 2011 - Mar 31, 2012**	**625,934**	**56.9**

a. Baseline Diabetes population. Refer to Appendix B for details.

- As of March 31, 2012, 56.9% of Ontarians with diabetes (age 18+) had received an HbA1c test in the past six months.
- The number of people with diabetes who received an HbA1c test increased by approximately 85,900 people since baseline (i.e., between Jul 1, 2009 - Dec 31, 2009). The proportion of patients receiving the test however was almost the same.
- These results include only tests conducted in community laboratories; some diabetes patients may have received tests in hospital laboratories.

LHIN results

Table 7.2: Number and percentage of Ontarians with diabetes (age 18+) receiving at least one HbA1c test during a six-month period, Baseline to Mar 31, 2012 by LHIN

	Baseline Diabetes Population[a]		Diabetes Patients as of April 1, 2010		Diabetes Patients as of April 1, 2011		Diabetes Patients as of April 1, 2012	
	July 1, 2009– Dec 31, 2009		Oct 1, 2009– Mar 31, 2010		Oct 1, 2010– Mar 31, 2011		Oct 1, 2011– Mar 31, 2012	
LHIN	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Erie St. Clair	25,774	51.2	26,861	52.4	29,701	54.7	31,919	56.0
South West	36,827	54.7	37,863	55.7	40,333	55.9	42,298	55.6
Waterloo Wellington	29,026	**64.3**	30,077	**64.9**	31,830	**64.1**	33,619	**63.9**
HNHB	59,442	58.4	61,664	59.4	64,541	58.9	67,858	59.1
Central West	37,280	56.3	38,638	56.3	41,393	56.0	44,410	56.1
Mississauga Halton	44,113	57.5	45,476	58.0	47,969	57.1	50,855	56.8
Toronto Central	41,474	52.0	41,945	52.4	43,872	51.7	46,221	51.8
Central	72,210	59.2	74,144	59.4	78,391	58.6	83,590	58.6
Central East	75,591	59.8	77,552	60.3	82,475	60.3	87,109	60.6
South East	23,773	62.8	24,946	64.5	26,275	63.7	27,530	63.6
Champlain	43,115	51.8	43,892	52.4	46,747	52.6	49,364	52.7
North Simcoe Muskoka	15,320	51.9	15,937	52.5	18,742	57.9	19,725	57.5
North East	24,319	**46.2**	25,232	**46.9**	26,477	**46.6**	27,392	**46.4**
North West	10,763	52.5	11,618	54.8	12,410	55.0	13,029	54.8
Unknown	987	-	1,049	-	891	-	1,015	-
ONTARIO	540,014	56.2	556,894	56.8	592,047	56.8	625,934	56.9

a. Baseline Diabetes population. Refer to Appendix B for details.

The lowest and highest percentages are bolded.

- The proportion who received an HbA1c test in the six-month period ending on March 31, 2012 ranged from 46.4% (North East LHIN) to 63.9% (Waterloo Wellington LHIN).
- In all three reporting periods the proportion who had received an HbA1c test was consistently highest among people with diabetes in the Waterloo Wellington LHIN, and consistently lowest among those in the North East LHIN.
- Compared with the baseline, the number of patients who received an HbA1c test has increased in all LHINs; however, the proportion has increased in nine of the fourteen LHINs.
- These results include only tests conducted in community laboratories; some diabetes patients may have received the tests in hospital laboratories. Furthermore, there may be gaps in the completeness of lab test data from a small number of rural labs. These labs are located in Winchester, Fergus, Huntsville & Bracebridge. Although these labs account for less than 1% of all submitted lab services, it may impact the testing rates for physicians in these communities.

8. Low Density Lipoprotein Cholesterol (LDL-C) testing frequency

Description:	**Percent of Ontarians (age 18+) with diabetes who have received an LDL test in the past year.**
Rationale:	Vascular disease is a common complication of diabetes. Control of cholesterol is associated with a risk reduction for vascular disease including cardiovascular events. Patients with diabetes need regular monitoring of the cholesterol levels. According to the Canadian Diabetes Association's guidelines, LDL-C should be tested at the time of diagnosis and every 1-3 years (Pg. S34, Clinical Practice Guidelines for Diabetes, Canadian Diabetes Association, 2008).
Data Source:	Baseline Diabetes Dataset Initiative (BDDI), MOHLTC
Target:	**80%**

Provincial results

Table 8.1: Number and percent of Ontarians with diabetes (age 18+) receiving LDL-C test during one-year period, Baseline to Mar 31, 2012

	Time period	#	%
Baseline Diabetes Population[a]	Jan 1, 2009 - Dec 31, 2009	659,833	68.6
Diabetes Patients as of April 1, 2010	Apr 1, 2009 - Mar 31, 2010	676,850	69.1
Diabetes Patients as of April 1, 2011	Apr 1, 2010 - Mar 31, 2011	724,271	69.5
Diabetes Patients as of April 1, 2012	**Apr 1, 2011 - Mar 31, 2012**	**759,265**	**69.0**

a. Baseline Diabetes population. Refer to Appendix B for details.

- The number of people with diabetes who received an LDL-C test within the 12 months prior to Mar 31, 2012 increased by approximately 99,400 compared with baseline (i.e., between Jan 1, 2009 - Dec 31, 2009). However, the proportion who received the test was almost the same (69.0% versus 68.6%).
- These results include only tests conducted in community laboratories; some patients may have received the tests in hospital laboratories.

LHIN results

Table 8.2. Number and percent of Ontarians with diabetes (age 18+) receiving LDL-C test during a one-year period, Baseline to Mar 31, 2012 by LHIN

	Baseline Diabetes Population[a]		Diabetes Patients as of April 1, 2010		Diabetes Patients as of April 1, 2011		Diabetes Patients as of April 1, 2012	
	Jan 1, 2009– Dec 31, 2009		Apr 1, 2009– Mar 31, 2010		Apr 1, 2010– Mar 31, 2011		Apr 1, 2011– Mar 31, 2012	
LHIN	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Erie St. Clair	31,661	62.9	32,735	63.9	36,309	66.8	39,094	68.5
South West	41,620	61.8	42,404	62.4	45,604	63.2	47,501	62.5
Waterloo Wellington	32,135	71.2	33,082	71.4	35,474	71.5	37,001	70.3
HNHB	72,114	70.8	74,160	71.4	78,031	71.2	81,140	70.6
Central West	48,175	72.7	49,993	72.9	54,040	73.1	57,903	73.1
Mississauga Halton	56,670	73.9	58,403	74.4	61,820	73.5	65,387	73.1
Toronto Central	52,621	66.0	53,139	66.3	55,985	66.0	58,544	65.6
Central	90,959	**74.6**	93,586	**75.0**	100,124	**74.9**	106,196	**74.5**
Central East	93,848	74.2	95,716	74.4	102,204	74.8	106,663	74.2
South East	26,623	70.3	27,406	70.8	29,302	71.1	29,902	69.0
Champlain	55,065	66.1	55,675	66.4	59,228	66.6	62,079	66.3
North Simcoe Muskoka	17,911	60.7	18,634	61.4	21,703	67.0	22,641	66.0
North East	28,014	**53.2**	28,730	**53.4**	30,400	**53.6**	30,785	**52.1**
North West	11,228	54.7	11,897	56.1	12,966	57.5	13,182	55.4
Unknown	1,189	-	1,290	-	1,081	-	1,247	-
ONTARIO	659,833	68.6	676,850	69.1	724,271	69.5	759,265	69.0

a. Baseline Diabetes population. Refer to Appendix B for details.

The lowest and highest percentages are bolded.

- The proportion of people with diabetes who received an LDL-C test in the last reported one-year period (i.e., between Apr 1, 2011 and Mar 31, 2012) ranged from 52.1% in the North East LHIN to 74.5% in the Central LHIN. In all LHIN areas, except the North East and North West, at least 62% of those with diabetes had received an LDL-C test in the past year.
- In all LHINs, the number of patients who received an LDL-C test within the 12 months prior to March 31, 2012 is higher than during baseline; however, the proportion of those tested improved notably in only two LHINs (Erie St. Clair and North Simcoe Muskoka).
- These results include only tests conducted in community laboratories; some diabetes patients may have received the tests in hospital laboratories. Furthermore, there may be gaps in the completeness of lab test data from a small number of rural labs. These labs are located in Winchester, Fergus, Huntsville & Bracebridge. Although these labs account for less than 1% of all submitted lab services, it may impact the testing rates for physicians in these communities.

9. Retinal Eye Exam testing frequency

Description: **Percent of Ontarians (age 18+) with diabetes who have received a retinal eye exam within the past two years.**

Rationale: Diabetic retinopathy is a common complication of diabetes. It is the leading cause of new cases of blindness among adults of working age. Effective and timely screening for diabetic retinopathy can help reduce vision loss. According to the Canadian Diabetes Association's guidelines, "In individuals with type 2 diabetes, screening and evaluation for diabetic retinopathy by an expert professional should be performed at the time of diagnosis of diabetes. The interval for follow-up assessments should be tailored to the severity of the retinopathy. In those with no or minimal retinopathy, the recommended interval is 1 to 2 years" (Pg. S34, Clinical Practice Guidelines for Diabetes, Canadian Diabetes Association 2008).

Data Source: Baseline Diabetes Dataset Initiative (BDDI), MOHLTC.

Target: **80%**

Provincial results

Table 9.1: Number and percent of Ontarians with diabetes (age 18+) receiving retinal eye exam during a two-year period, Baseline to Mar 31, 2012

	Time period	#	%
Baseline Diabetes Population[a]	July 1, 2009 - Dec 31, 2009	627,838	65.3
Diabetes Patients as of April 1, 2010	Oct 1, 2009 - Mar 31, 2010	640,628	65.4
Diabetes Patients as of April 1, 2011	Oct 1, 2010 - Mar 31, 2011	690,504	66.2
Diabetes Patients as of April 1, 2012	**Oct 1, 2011 - Mar 31, 2012**	**734,270**	**66.7**

a. Baseline Diabetes population. Refer to Appendix B for details.

- The number of people with diabetes who received a retinal eye exam within the one year prior to March 31, 2012 increased by approximately 106,400 compared to baseline (i.e. Jul 1, 2009 – Dec 31, 2009), while the proportion of those who received eye exams is 1.4 percentage points higher.
- These results include only retinal eye exams where a fee-for-service claim was submitted; some patients may have had a retinal eye exam performed by a provider who did not submit a claim or shadow billing.

LHIN results

Table 9.2: Number and percent of Ontarians with diabetes (age 18+) receiving retinal eye exam during a two-year period, Baseline to Mar 31, 2012 by LHIN

	Baseline Diabetes Population[a]		Diabetes Patients as of April 1, 2010		Diabetes Patients as of April 1, 2011		Diabetes Patients as of April 1, 2012	
	Jan 1, 2008– Dec 31, 2009		Apr 1, 2008– Mar 31, 2010		Apr 1, 2009– Mar 31, 2010		Apr 1, 2011– Mar 31, 2012	
LHIN	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Erie St. Clair	34,602	68.7	35,207	68.7	37,605	69.2	39,557	69.3
South West	46,429	68.9	47,126	69.3	50,709	70.3	53,756	70.7
Waterloo Wellington	31,138	69.0	32,119	69.3	34,631	69.8	36,702	69.7
HNHB	69,133	67.9	70,716	68.1	75,311	68.7	79,513	69.2
Central West	39,023	**58.9**	40,314	**58.8**	44,818	60.6	49,017	61.9
Mississauga Halton	48,300	63.0	49,369	62.9	53,487	63.6	57,407	64.2
Toronto Central	47,587	59.7	47,799	59.7	51,317	**60.5**	54,481	**61.1**
Central	76,137	62.4	77,989	62.5	84,917	63.5	91,476	64.2
Central East	82,470	65.2	83,858	65.2	90,200	66.0	95,875	66.7
South East	26,543	**70.1**	27,315	**70.6**	29,504	**71.6**	30,843	**71.2**
Champlain	54,988	66.0	55,445	66.2	59,545	66.9	63,041	67.3
North Simcoe Muskoka	19,743	66.9	20,451	67.4	22,176	68.5	23,755	69.2
North East	36,798	69.9	37,594	69.8	40,205	70.8	41,930	71.0
North West	13,831	67.4	14,146	66.7	15,080	66.8	15,830	66.6
Unknown	1,116	-	1,180	-	999	-	1,087	-
ONTARIO	627,838	65.3	640,628	65.4	690,504	66.2	734,270	66.7

a. Baseline Diabetes population. Refer to Appendix B for details.

The lowest and highest percentages are bolded.

- The most recent results show that retinal eye exam testing rates are highest among diabetes patients in the South East LHIN (71.2%), and lowest among those in the Toronto Central LHIN (61.1%).
- In all LHINs, the number and proportion of people with diabetes who received a retinal eye exam as of April 1, 2012 is slightly higher than during baseline.
- These results include only retinal eye exams where a fee-for-service claim was submitted; some patients may have had a retinal eye exam performed by a provider who did not submit a claim or shadow billing.

10. All 3 tests within guideline periods (composite indicator)

Description: **Percent of Ontarians (age 18+) with diabetes who have received all three tests (HbA1c, LDL-C and retinal eye exam) within the appropriate guideline periods.**

Rationale: The use of a composite indicator has been shown to be effective in spurring improvements in diabetes management. Other jurisdictions have seen substantial improvements in short periods of time after reporting of composite indicators for diabetes care was introduced. Rates for combined measures are lower than individual measures but this can stimulate action, focus attention on patients and emphasize a systems approach to patient care (Nolan and Berwick 2006; Amundson et al., 2007; Kelley 2007).

Data Source: Baseline Diabetes Dataset Initiative (BDDI), MOHLTC.

Target: **80%**

Provincial results

Table 10.1: Number and percent of Ontarians with diabetes (age 18+) receiving all three tests within guideline periods, Baseline to Mar 31, 2012

	Time period	#	%
Baseline Diabetes Population[a]	July 1, 2009 - Dec 31, 2009	361,192	37.6
Diabetes Patients as of April 1, 2010	Oct 1, 2009 - Mar 31, 2010	370,388	37.8
Diabetes Patients as of April 1, 2011	Oct 1, 2010 - Mar 31, 2011	405,036	38.9
Diabetes Patients as of April 1, 2012	**Oct 1, 2011 - Mar 31, 2012**	**431,915**	**39.2**

a. Baseline Diabetes population. Refer to Appendix B for details.

- Compared with the baseline (i.e. Jul 1, 2009 – Dec 31, 2009), an additional 70,700 people with diabetes had received all three tests within guideline periods by March 31, 2012, and the proportion of those who received all three tests increased from 37.6% to 39.2%.
- These results include only HbA1c and LDL-C tests conducted in community laboratories (some diabetes patients may have received HbA1c tests in hospital laboratories) and retinal eye exams where a fee-for-service claim was submitted (some patients may have had a retinal eye exam performed by a provider who did not submit a claim or shadow billing).
- Figure 10.2 shows the proportion of people with diabetes, age 18+, who had all three tests (HbA1c, LDL-C and retinal eye exam) completed within guideline periods, by subLHIN area. The lowest testing rates are seen in parts of South West, North Simcoe Muskoka, North East and North West LHINs[4].

[4] Testing may be artificially low in some rural areas where there are few or no community labs. In these areas, patients may be receiving HbA1c and LDL-C tests at hospitals but these are not captured in our analysis.

LHIN results

Table 10.1: Number and percent of Ontarians with diabetes (age 18+) receiving all three tests within guideline periods, Baseline to Mar 31, 2012 by LHIN

	Baseline Diabetes Population[a]		Diabetes Patients as of April 1, 2010		Diabetes Patients as of April 1, 2011		Diabetes Patients as of April 1, 2012	
	July 1, 2009– Dec 31, 2009		Apr 1, 2009– Mar 31, 2010		Apr 1, 2010– Mar 31, 2011		Apr 1, 2011– Mar 31, 2012	
LHIN	**#**	**%**	**#**	**%**	**#**	**%**	**#**	**%**
Erie St. Clair	17,241	34.2	17,884	34.9	20,531	37.8	22,406	39.3
South West	24,568	36.5	25,252	37.2	27,786	38.5	29,369	38.6
Waterloo Wellington	19,824	**43.9**	20,462	**44.2**	22,136	**44.6**	23,285	**44.2**
HNHB	40,748	40.0	42,134	40.6	44,923	41.0	47,568	41.4
Central West	23,816	36.0	24,409	35.6	27,221	36.8	30,002	37.9
Mississauga Halton	30,029	39.2	30,727	39.2	33,075	39.3	35,652	39.9
Toronto Central	26,535	33.3	26,760	33.4	28,843	34.0	30,920	34.7
Central	48,203	39.5	49,147	39.4	53,759	40.2	58,185	40.8
Central East	51,335	40.6	52,192	40.6	57,117	41.8	60,677	42.2
South East	16,206	42.8	16,940	43.8	18,340	44.5	18,940	43.7
Champlain	29,087	34.9	29,519	35.2	32,167	36.2	34,175	36.5
North Simcoe Muskoka	9,940	33.7	10,350	34.1	12,569	38.8	13,493	39.3
North East	16,618	31.5	17,128	**31.8**	18,415	**32.4**	18,835	**31.9**
North West	6,387	**31.1**	6,819	32.1	7,549	33.5	7,758	32.6
Unknown	655	-	665	-	605	-	650	-
ONTARIO	361,192	37.6	370,388	37.8	405,036	38.9	431,915	39.2

a. Baseline Diabetes population. Refer to Appendix B for details.

The lowest and highest percentages are bolded.

- The most recent results show that the number and proportion of people receiving all three tests within guideline periods has increased across all LHINs since baseline.
- The proportion of diabetes patients tested within the guideline periods prior to March 31, 2012 ranged from 31.9% in the North East LHIN to 44.2% in the Waterloo Wellington LHIN.
- In all four reporting periods, the proportion of people with diabetes receiving HbA1c, LDL-C and retinal eye exam tests within guideline periods was consistently highest in the Waterloo Wellington LHIN.
- The largest improvement in testing rates since baseline is for patients in North Simcoe Muskoka, Erie St. Clair, South West, Central West and Champlain LHINs.
- There is considerable variation between LHIN areas (SubLHINs). The SubLHIN area testing rates range from 13.5% to 52.4% (see Figures 10.1 & 10.2).
- These results include only HbA1c and LDL-C tests conducted in community laboratories (some diabetes patients may have received HbA1c tests in hospital laboratories) and retinal eye exams where a fee-for-service claim was submitted (some patients may have had a retinal eye exam performed by a provider who did not submit a claim or shadow billing).

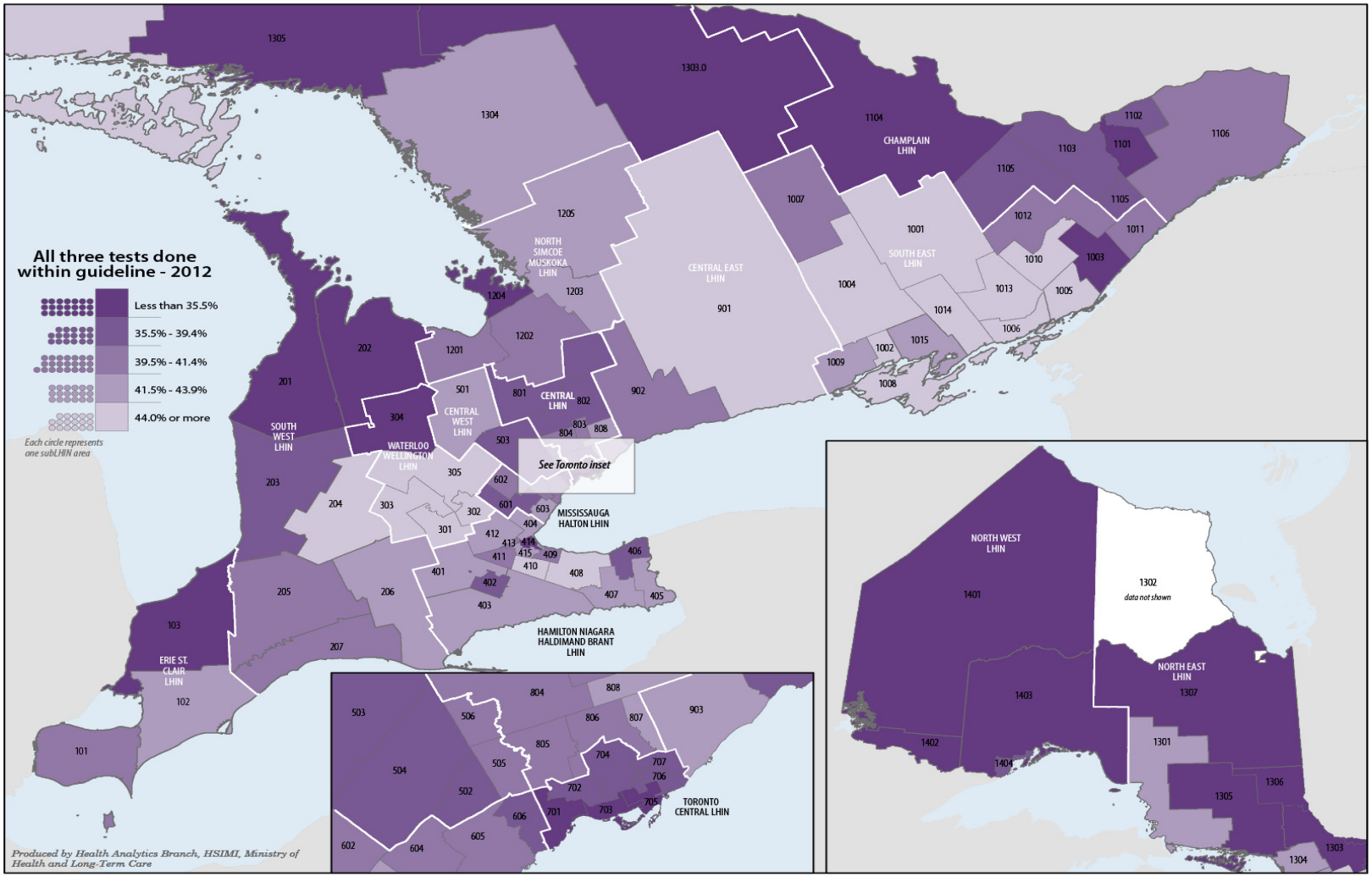
Figure 10.1: Histogram for percent of Ontarians with (age 18+) receiving all three tests within guideline periods, by subLHIN as of March 31, 2012

LHIN, subLHIN		All 3 tests within guideline period (%)
Erie St. Clair LHIN		
101	Essex	40.3
102	Chatham-Kent	41.9
103	Lambton	33.8
South West LHIN		
201	Bruce	18.5
202	Grey	33.9
203	Huron	37.8
204	Perth	44.9
205	Middlesex	41.1
206	Oxford-Norfolk	41.4
207	Elgin	39.9
Waterloo Wellington LHIN		
301	Urban Waterloo & Rural Waterloo South	44.2
302	Urban Guelph	46.6
303	Rural Waterloo	45.7
304	Rural-South Grey and North Wellington	31.4
305	Rural Wellington	45.9
Hamilton Niagara Haldimand Brant LHIN		
401	Brant and Brantford	43.0
402	New Credit and Six Nations	38.0
403	Haldimand and Norfolk	43.7
404	Burlington	42.6
405	East Niagara	41.6
406	North Niagara	39.1
407	South Niagara	43.3
408	West Niagara	47.1
409	Stoney Creek	41.1
410	Glanbrook	44.6
411	Ancaster	39.4
412	Flamborough	42.7
413	Dundas	41.0
414	Hamilton Urban Core	34.6
415	Hamilton Outer Core	41.4
Central West LHIN		
501	Dufferin County	42.5
502	Malton (Mississauga)	37.5
503	Caledon	37.0
504	Brampton	36.5
505	Rexdale (Toronto)	40.6
506	Woodbridge (Vaughan)	41.0
Mississauga Halton LHIN		
601	Milton	37.6
602	Halton Hills	40.3
603	Oakville	42.3
604	Northwest Mississauga	39.5
605	Southeast Mississauga	40.2
606	South Etobicoke-Toronto	38.2
Toronto Central LHIN		
701	West	34.6
702	North West	36.2
703	South West	31.1
704	North Toronto	35.1
705	South East	30.1
706	East	36.7
707	North East	38.4

LHIN, subLHIN		All 3 tests within guideline period (%)
Central LHIN		
801	South Simcoe & Northern York Region	39.1
802	Central York Region	38.4
803	Richmond Hill	40.2
804	South West York Region	41.3
805	North York West	40.3
806	North York Central	40.3
807	North York East	41.5
808	Markham	43.4
Central East LHIN		
901	North East Cluster	44.9
902	Durham Cluster	41.3
903	Scarborough Cluster	41.7
South East LHIN		
1001	Addington, N&C Frontenac	47.8
1002	Belleville	44.4
1003	Brockville	34.8
1004	Central Hastings	52.4
1005	Gananoque, Leeds	47.2
1006	Kingston & Islands	44.7
1007	North Hastings	39.9
1008	Prince Edward County	47.1
1009	Quinte West, Brighton	43.8
1010	Rideau Lakes	45.4
1011	SE Leeds & Grenville	41.4
1012	Smiths Falls, Perth, Lanark	39.7
1013	South Frontenac	45.2
1014	Stone Mills, Loyalist	46.5
1015	Tyendinaga, Napanee	43.7
Champlain LHIN		
1101	Ottawa Centre	33.8
1102	Ottawa East	35.2
1103	Ottawa West	36.5
1104	Renfrew County	34.2
1105	North Lanark / North Grenville	37.0
1106	Eastern Counties	40.6
North Simcoe Muskoka LHIN		
1201	Collingwood and Area	40.5
1202	Barrie and Area	40.9
1203	Orillia and Area	42.2
1204	Midland and Penetanguishene Area	24.4
1205	Muskoka	41.8
North East LHIN		
1301	Algoma	43.5
1302	James and Hudson Bay Coasts	*data not shown*
1303	Nipissing	24.8
1304	Parry Sound	43.5
1305	Manitoulin-Sudbury	31.7
1306	Timiskaming	28.2
1307	Cochrane	20.6
North West LHIN		
1401	Kenora	28.0
1402	Rainy River	32.3
1403	Thunder Bay District	13.5
1404	Thunder Bay City	39.1

Figure 10.2: Testing rates for all 3 tests completed within guideline periods as of March 31, 2012, by subLHIN area

LHIN boundaries are shown in white. SubLHINs with lower testing rates are shown as darker colours. Areas with higher testing rates are shown in lighter shading.



11. Emergency visits for hyper/hypoglycemia

Description:	**Rate of emergency visits for hyperglycemia or hypoglycemia per 100,000 Ontario population (age 18+) with diabetes.**
Rationale:	Emergency visits for diabetes patients with blood sugar levels that are dangerously high (hyperglycemic) or dangerously low (hypoglycemic) should be largely avoidable if diabetes is effectively managed. Glycemic emergencies can be the result of variations in proper care, misadministration of insulin or failure to follow a proper diet. Improved management of diabetes patients is expected to result in better glycemic control and therefore to prevent acute hyperglycemic or hypoglycemic episodes.
Data Source:	Historical estimates: Ontario Diabetes Database (ODD), Institute for Clinical Evaluative Sciences (ICES). Current estimates: Baseline Diabetes Dataset Initiative (BDDI), MOHLTC; and National Ambulatory Care Reporting System (NACRS), Canadian Institue for Health Information (CIHI).
Target:	Not applicable

Provincial results

Table 11.1: Number and rate of emergency visits for hyper/hypoglycemia per 100,000 Ontarians (age 18+) with diabetes, 2002/03 to 2011/12

			Rate per 100,000	
	Time period	#	Crude	Age-adjusted[a]
ICES – historical[b]	2002/03	13,510	1,949	-
	2003/04	15,168	2,045	-
	2004/05	16,466	2,067	-
	2005/06	16,948	1,969	-
	2006/07	14,524	1,568	-
	2007/08	13,836	1,427	-
Diabetes patients, BDDI	2008/09	11,275	1,314	1,321
	2009/10	10,491	1,151	1,161
	2010/11	10,463	1,068	1,082
	2011/12	**10,175**	**976**	**991**

a. Rates are age-adjusted to control for differences in age composition of population over time.
b. Historical analyses (from ICES) are provided for context. Results based on BDDI should not be compared with results from ICES.

- During 2011/12, Ontarians with diabetes made 10,175 visits to emergency rooms for hyper or hypoglycemia.
- Both the crude and age-adjusted rates have been decreasing (i.e., improving) since 2008/09.

LHIN results

Table 11.2: Number and rate of emergency visits for hyper/hypoglycemia per 100,000 diabetes population (age 18+) in Ontario by LHIN, 2009/10 to 2011/12

LHIN	2009/10			2010/11			2011/12			Trend
	#	Rate per 100,000		#	Rate per 100,000		#	Rate per 100,000		
		Crude	Age-adjusted[a]		Crude	Age-adjusted[a]		Crude	Age-adjusted[a]	
Erie St. Clair	660	1,374	1,417	656	1,280	1,327	625	1,151	1,184	▼
South West	947	1,497	1,558	950	1,398	1,487	913	1,266	1,341	▼
Waterloo Wellington	448	1,053	1,061	412	889	908	418	842	855	▼
HNHB	1,263	1,301	1,352	1,300	1,252	1,309	1,136	1,037	1,097	▼
Central West	434	691	**711**	516	752	784	518	700	718	▲
Mississauga Halton	589	818	823	591	753	757	560	666	672	▼
Toronto Central	830	1,106	1,092	901	1,125	1,116	887	1,046	1,040	▼
Central	885	764	759	877	702	**703**	872	652	**654**	▼
Central East	1,251	1,044	1,047	1,182	919	922	1,228	898	904	▼
South East	656	1,822	**1,958**	696	1,799	**1,949**	722	1,751	**1,920**	▼
Champlain	947	1,212	1,242	935	1,116	1,146	908	1,021	1,051	▼
North Simcoe Muskoka	479	1,696	1,775	424	1,397	1,455	398	1,229	1,293	▼
North East	761	1,507	1,575	703	1,306	1,371	673	1,186	1,253	▼
North West	317	1,596	1,569	290	1,367	1,344	300	1,330	1,313	▼
LHIN unknown	24	-	-	30	-	-	17	-	-	
ONTARIO	10,491	1,151	1,161	10,463	1,068	1,082	10,175	976	991	▼

a. Rates are age-adjusted to control for differences in age composition of population over time.
The lowest and highest rates are bolded.

- In 2011/12, the age-adjusted rate of emergency visits for hyper or hypoglycemia varied considerably by LHIN ranging from 654 per 100,000 persons with diabetes in the Central LHIN to 1,920 in the South East LHIN.
- Since 2009/10, the crude and age-adjusted rates have been decreasing (i.e. improving) in all LHINs (with the exception of Central West LHIN).
- In all three reporting periods, South East LHIN had the highest crude and age-adjusted rates.

12. Renal replacement therapy rates

Description:	**Age-adjusted rate of renal replacement therapy (renal dialysis or kidney transplant) among diabetes patients (age 18+) per 100,000 population with diabetes.**
Rationale:	Diabetes is the leading cause of kidney failure requiring dialysis or a transplant. Adequate diabetes management may help lower rates of end stage renal disease (ESRD) in this patient population (Oliver et al., 2003).
Data Source:	Historical estimates: Ontario Diabetes Database (ODD), Institute for Clinical Evaluative Sciences (ICES). Baseline Diabetes Dataset Initiative (BDDI), MOHLTC; Discharge Abstract Database (DAD), Canadian Institute for Health Information (CIHI); and OHIP Claims History Database, MOHLTC.
Note:	Analysis is based on the number of patients who receive renal replacement therapy.
Target:	**Maintain at current level**

Provincial results

Table 12.1: Number and rate of renal replacement therapy (renal dialysis or kidney transplant) per 100,000 Ontarians with diabetes, 2002/03 to 2011/12

			Rate per 100,000	
	Time period	#	Crude	Age-adjusted[a]
ICES – historical[b]	2002/03	5,288	762	762
	2003/04	5,667	762	762
	2004/05	6,129	766	767
	2005/06	6,702	774	774
	2006/07	7,337	782	779
	2007/08	7,956	796	791
Diabetes patients, BDDI	2008/09	8,066	940	934
	2009/10	8,485	931	922
	2010/11	8,499	867	858
	2011/12	**8,822**	**846**	**836**

a. Rates are age-adjusted to control for differences in age composition of population over time.
b. Historical analyses (from ICES) are provided for context. Results based on BDDI should not be compared with results from ICES.

- In 2011/12, 8,822 Ontarians (age 18+) with diabetes were receiving renal replacement therapy (i.e., renal dialysis or kidney transplant). This is more than 300 patients compared to in 2010/11 and 2009/10 and more than 750 in 2008/09.
- Since 2008/09, the renal replacement therapy rate has been decreasing.

LHIN results

Table 12.2: Number and rate of renal replacement therapy (renal dialysis or kidney transplant) per 100,000 Ontarians with diabetes (age 18+) by LHIN, 2009/10 to 2011/12

LHIN	2009/10			2010/11			2011/12			Trend
	#	Rate per 100,000		#	Rate per 100,000		#	Rate per 100,000		
		Crude	Age-adjusted[a]		Crude	Age-adjusted[a]		Crude	Age-adjusted[a]	
Erie St. Clair	383	797	791	437	853	842	472	869	850	▲
South West	554	876	856	548	806	792	586	813	798	▼
Waterloo Wellington	645	1,517	**1,495**	408	881	872	396	798	786	▼
HNHB	940	968	938	984	948	916	972	887	857	▼
Central West	545	867	927	539	786	837	602	814	855	▼
Mississauga Halton	536	745	**759**	587	748	**762**	609	725	**736**	▼
Toronto Central	720	960	954	730	911	905	739	872	865	▼
Central	970	838	825	977	782	771	1,047	783	769	▼
Central East	1,148	958	954	1,183	920	913	1,228	898	890	▼
South East	313	870	858	329	851	836	350	849	827	▼
Champlain	720	922	912	728	869	860	724	814	806	▼
North Simcoe Muskoka	279	988	974	297	978	948	292	902	873	▼
North East	489	969	964	498	925	920	534	941	931	▼
North West	232	1,168	1,167	245	1,155	**1,149**	262	1,161	**1,159**	▼
LHIN unknown	11	-	-	9	-	-	9	-	-	
ONTARIO	8,485	931	922	8,499	867	858	8,822	846	836	▼

a. Rates are age-adjusted to control for differences in age composition of population over time.
The lowest and highest rates are bolded.

- In 2011/12, the renal replacement therapy rate varied considerably across LHINs. It was highest among diabetes patients in the North West LHIN (1,159 per 100,000) and lowest among diabetes patients in the Mississauga Halton LHIN (736 per 100,000).
- In both 2010/11 and 2011/12, rates were highest among diabetes patients in the North West LHIN.
- Since 2009/10, rates have been decreasing in all LHINs (with the exception of the Erie St. Clair LHIN).

13. Infection, ulcer, amputation rates

Description:	**Age-adjusted rate of infections, ulcers, amputations among Ontarians with diabetes, age 18+.**
Rationale:	Diabetes is a major risk factor for peripheral vascular disease and neuropathy. Approximately 50% of all amputations of the lower extremity are reported to be performed in patients with diabetes. Adequate diabetes management may help to lower rates of amputation in this patient population**.**
Data Source:	Historical estimates: Ontario Diabetes Database (ODD), Institute for Clinical Evaluative Sciences (ICES). Current estimates: Baseline Diabetes Dataset Initiative (BDDI), MOHLTC; Discharge Abstract Database (DAD), Canadian Institute for Health Information (CIHI).
Note:	The numbers and rates below include common infections as well as soft tissue (i.e., foot) infections. Analysis is based on hospitalizations among prevalent diabetes cases.
Target:	**Reduce by 10%**

Provincial results

Table 13.1: Number and rate (per 100,000) of hospitalizations for common infection[a], skin/soft tissue infection or amputations[b] among Ontarians with diabetes (age 18+), 2002/03 to 2011/12

			Rate per 100,000	
	Time period	#	Crude	Age-adjusted[c]
ICES – historical[d]	2002/03	27,239	3,923	3,923
	2003/04	26,758	3,592	3,598
	2004/05	28,514	3,546	3,564
	2005/06	30,136	3,445	3,481
	2006/07	31,736	3,313	3,381
	2007/08	27,239	3,212	3,309
Diabetes patients, BDDI	2008/09	29,240	3,409	3,343
	2009/10	30,588	3,355	3,268
	2010/11	34,050	3,475	3,368
	2011/12	**36,750**	**3,525**	**3,390**

a. Infections such as pneumonia, sepsis, or urinary tract infections.
b. Includes minor (toe, foot) and major (ankle, knee, below knee or above knee) amputations.
c. Rates are age-adjusted to control for differences in age composition of population over time.
d. Historical analyses (from ICES) are provided for context. Results based on BDDI should not be compared with results from ICES.

- In 2011/12, there were 36,750 hospitalizations for a common infection, skin/soft tissue infection or amputation among Ontarians with diabetes (age 18+). This is 2,700 more patients than in 2010/11, 6,100 more than in 2009/10, and 7,500 more than in 2008/09.

- In 2011/12, the age-adjusted rate was 3,390 per 100,000 Ontarians with diabetes (age 18+). The rate has increased slightly since 2008/09.

Table 13.2: Number and rate (per 100,000) of hospitalizations for common infection[a], skin/soft tissue infection or amputation[c] among Ontarians with diabetes (age 18+), 2008/09 to 2011/12

	Common infections			Skin/soft tissue infections			Amputations		
		Rate per 100,000			Rate per 100,000			Rate per 100,000	
Time period	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]
2008/09	24,094	2,809	2,747	4,909	572	567	1,805	210	209
2009/10	25,279	2,773	2,690	5,223	573	567	1,631	179	178
2010/11	28,559	2,914	2,813	5,607	572	565	1,596	163	161
2011/12	**30,798**	**2,954**	**2,827**	**6,086**	**584**	**575**	**1,697**	**163**	**160**

a. Infections such as pneumonia, sepsis, or urinary tract infections.
b. Includes minor (toe, foot) and major (ankle, knee, below knee or above knee) amputations.
c. Rates are age-adjusted to control for differences in age composition of population over time.

- In 2011/12, among adults with diabetes in Ontario, there were: 30,798 hospital separations for common infections; 6,086 hospital separations for ulcers (skin/soft tissue infections) and 1,697 hospital separations for amputations.
- Both the number and rate of common and skin/soft tissue infection hospitalizations among adults with diabetes increased between 2008/9 and 2011/12.
- Conversely, the number and rate of amputations have decreased between 2008/9 and 2011/12.

LHIN results

Table 13.3: Number and rate (per 100,000) of hospitalizations for common infection, skin/soft tissue infection or amputation among Ontarians with diabetes, by LHIN, 2009/10 and 2010/11

	2009/10			2010/11			2011/12			Trend
		Rate per 100,000			Rate per 100,000			Rate per 100,000		
LHIN	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]	
Erie St. Clair	1,755	3,654	3,469	1,973	3,850	3,631	2,108	3,881	3,644	▲
South West	2,367	3,742	3,495	2,832	4,167	3,887	3,054	4,235	3,941	▲
Waterloo Wellington	1,346	3,165	3,072	1,490	3,216	3,107	1,574	3,171	3,040	▼
HNHB	3,933	4,051	3,778	4,326	4,166	3,884	4,532	4,137	3,798	▲
Central West	1,588	2,527	3,008	1,851	2,699	3,167	1,989	2,690	3,096	▲
Mississauga Halton	1,855	2,577	2,680	2,110	2,689	2,766	2,308	2,746	2,790	▲
Toronto Central	2,635	3,512	3,238	2,901	3,621	3,344	3,064	3,614	3,310	▲
Central	3,096	2,673	**2,569**	3,387	2,713	**2,595**	3,665	2,740	**2,609**	▲
Central East	3,440	2,871	2,837	3,721	2,894	2,837	4,114	3,009	2,924	▲
South East	1,272	3,534	3,349	1,453	3,756	3,560	1,578	3,827	3,609	▲
Champlain	2,799	3,583	3,478	3,175	3,788	3,651	3,390	3,811	3,648	▲
North Simcoe Muskoka	1,179	4,174	4,012	1,234	4,065	3,862	1,373	4,240	4,013	▲
North East	2,057	4,074	4,033	2,296	4,265	4,179	2,562	4,514	4,359	▲
North West	1,209	6,087	**6,252**	1,252	5,900	**6,028**	1,378	6,109	**6,197**	▼
LHIN unknown	57	-	-	49	-	-	61	-	-	
ONTARIO	30,588	3,355	3,268	34,050	3,475	3,368	36,750	3,525	3,390	▲

Lowest and highest rates are bolded.

- In both the current (2011/12) and previous (2010/11 and 2009/10) fiscal years, the hospitalization rate for common infection, skin/soft tissue infection or amputations varied across LHINs. Rates for common infection, skin/soft tissue infection and amputations for all three reported periods were highest in the North West LHIN and more than double the rate in the Central LHIN, the LHIN with the lowest rate.
- Since 2009/10, rates have been increasing in all LHINs (with the exception of the Waterloo Wellington and North West LHIN).

Table 13.4: Number and rate (per 100,000) of hospitalizations for common infection, skin/soft tissue infection or amputation among Ontarians with diabetes, by LHIN, 2011/12

	Common infections			Skin/soft tissue infections			Amputations		
		Rate per 100,000			Rate per 100,000			Rate per 100,000	
LHIN	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]
Erie St. Clair	1,785	3,286	3,055	345	635	627	94	173	171
South West	2,509	3,479	3,197	561	778	761	157	218	213
Waterloo Wellington	1,333	2,686	2,563	259	522	512	80	161	157
HNHB	3,796	3,465	3,145	767	700	674	219	200	192
Central West	1,697	2,295	2,678	299	404	434	74	100	107
Mississauga Halton	2,016	2,398	2,442	297	353	**356**	75	89	89
Toronto Central	2,594	3,059	2,772	497	586	564	100	118	115
Central	3,162	2,364	**2,239**	534	399	391	117	87	**87**
Central East	3,454	2,527	2,447	656	480	473	227	166	164
South East	1,275	3,093	2,876	310	752	744	86	209	204
Champlain	2,891	3,250	3,101	521	586	571	143	161	156
North Simcoe Muskoka	1,113	3,437	3,225	256	791	777	72	222	218
North East	2,037	3,589	3,444	488	860	850	169	298	289
North West	1,085	4,810	**4,895**	284	1,259	**1,261**	83	368	**376**
LHIN unknown	51	-	-	12	-	-	<5	-	-
ONTARIO	30,798	2,954	2,827	6,086	584	575	1,697	163	160

Lowest and highest rates are bolded.

- In 2011/12, for every 100,000 people with diabetes in the Mississauga Halton LHIN, 356 were hospitalized for a skin/soft tissue infection whereas in the North West LHIN 1,261 people were hospitalized.
- Similarly, for every 100,000 people with diabetes in the Central LHIN, there were 87 hospitalizations for amputations whereas there were 376 in the North West LHIN (a rate that is over four times higher).

14. Hospitalization rate for heart attacks

Description:	**Age-adjusted hospitalization rate for heart attacks (acute myocardial infarctions (AMI)) among Ontarians with diabetes, age 18+**
Rationale:	Diabetes is a major risk factor for cardiac disease which is, in turn, a leading cause of death among persons with diabetes. AMI (i.e., heart attack) rates are eight-fold higher among persons with diabetes than in those without diabetes. AMI can be prevented through optimal disease management and screening for cardiovascular risk factors in its early stages (Booth, Rothwell, Fung and Tu, 2003).
Data Source:	Historical estimates: Ontario Diabetes Database (ODD), Institute for Clinical Evaluative Sciences (ICES). Current estimates: Baseline Diabetes Dataset Initiative (BDDI), MOHLTC; Discharge Abstract Database (DAD), Canadian Institute for Health Information (CIHI).
Target:	**Reduce by 10%**

Provincial results

Table 14.1: Number and rate of heart attacks per 100,000 Ontarians (age 18+) with diabetes, 2002/03-2011/12

			Rate per 100,000	
	Time period	#	Crude	Age-adjusted[a]
ICES – historical[b]	2002/03	12,238	1,763	1,763
	2003/04	11,530	1,550	1,547
	2004/05	11,651	1,456	1,450
	2005/06	11,577	1,337	1,325
	2006/07	11,836	1,261	1,240
	2007/08	12,324	1,233	1,204
Diabetes patients, BDDI	2008/09	10,189	1,188	1,168
	2009/10	10,329	1,133	1,108
	2010/11	10,931	1,116	1,087
	2011/12	**10,957**	**1,051**	**1,018**

a. Rates are age-adjusted to control for differences in age composition of population over time.
b. Historical analyses (from ICES) are provided for context. Results based on BDDI should not be compared with results from ICES.

- In 2011/12, there were 10,957 hospital separations for heart attacks among Ontarians (age 18+) with diabetes. This is nearly 30 more hospital separations than in 2010/2011, almost 630 more than in 2009/10, and almost 770 more than in 2008/09.
- The age-adjusted rate of hospitalizations for heart attacks among those with diabetes has decreased from 1, 168 per 100,000 in 2008/9 to 1,018 per 100,000 in 2011/12.

LHIN results

Table 14.2: Number and rate of heart attacks per 100,000 Ontarians with diabetes (age 18+) by LHIN, 2009/10-2011/12

LHIN	2009/10			2010/11			2011/12			Trend
	#	Rate per 100,000		#	Rate per 100,000		#	Rate per 100,000		
		Crude	Age-adjusted[a]		Crude	Age-adjusted[a]		Crude	Age-adjusted[a]	
Erie St. Clair	687	1,430	1,356	717	1,399	1,328	702	1,292	1,215	▼
South West	763	1,206	1,130	767	1,129	1,049	845	1,172	1,081	▼
Waterloo Wellington	496	1,166	1,131	551	1,189	1,159	575	1,159	1,122	▼
HNHB	1,253	1,291	1,203	1,478	1,423	1,339	1,418	1,294	1,198	▼
Central West	640	1,018	1,129	658	959	1,062	655	886	973	▼
Mississauga Halton	555	771	**794**	566	721	**735**	599	713	**719**	▼
Toronto Central	720	960	912	748	934	891	670	790	755	▼
Central	1,030	889	867	1,041	834	809	1,089	814	781	▼
Central East	1,363	1,138	1,131	1,297	1,009	992	1,316	963	944	▼
South East	426	1,183	1,123	414	1,070	1,006	443	1,075	1,008	▼
Champlain	830	1,062	1,031	849	1,013	989	872	980	945	▼
North Simcoe Muskoka	391	1,384	1,336	497	1,637	1,575	397	1,226	1,152	▼
North East	818	1,620	1,580	1,017	1,889	**1,823**	1,017	1,792	**1,730**	▲
North West	339	1,707	**1,763**	307	1,447	1,503	346	1,534	1,571	▼
LHIN unknown	18	-	-	24	-	-	13	-	-	
ONTARIO	10,329	1,133	1,108	10,931	1,116	1,087	10,957	1,051	1,018	▼

a. Rates are age-adjusted to control for differences in age composition of population over time.
Lowest and highest rates are bolded.

- In 2011/12, the heart attack hospitalization rate varied considerably across LHINs. Rates were highest among diabetes patients in the North East LHIN (1,730 per 100,000) and lowest in the Mississauga Halton LHIN (719 per 100,000).
- Since 2009/10, heart attack hospitalization rates have been decreasing in all LHINs (with the exception of North East LHIN).

15. Ocular procedure rate (vitrectomy & laser photocoagulation)

Description:	**Rate of ocular procedures (vitrectomy & laser photocoagulation) per 100,000 Ontarians (age 18+) with diabetes**
Rationale:	Ocular complications can results in vision loss. Left untreated, proliferative diabetic retinopathy leads to blindness in 50% of patients within five years. If proliferative diabetic retinopathy is detected early, vision loss may be prevented by retinal laser photocoagulation. End-stage complications of diabetic retinopathy can be treated by vitrectomy, a surgical procedure (Booth, Lipscombe, Bhattacharyya et al., 2010). Tight glycemic control and optimal diabetes care can result in reductions in diabetic retinopathy (Rudinsky, Tennant and Johnson, 2009).
Data Source:	Baseline Diabetes Dataset Initiative (BDDI), MOHLTC; Claims History Database, MOHLTC.
Note:	The numbers and rates below include claims for vitrecotomy and laser photocoagulation procedures.
Target:	-

Provincial Results

Table 15.1: Number and rate of ocular procedures (vitrectomy, laser photocoagulation) per 100,000 Ontarians with diabetes, 2008/09-2011/12

	Time period	#	Rate per 100,000	
			Crude	Age-adjusted[a]
Diabetes patients, BDDI	2008/09	29,702	3,463	3,472
	2009/10	32,660	3,583	3,598
	2010/11	32,737	3,341	3,358
	2011/12	**32,988**	**3,164**	**3,183**

a. Rates are age-adjusted to control for differences in age composition of population over time.

- In 2011/12, there were 32,988 ocular procedures (i.e., vitrectomy or laser photocoagulation) performed for Ontarians (age 18+) with diabetes. This is slightly over 250 more procedures than in 2009/10, nearly 330 more than in 2009/10, and almost 3,290 more than in 2008/09.
- The age-adjusted rate of ocular procedures among adults with diabetes was lower in 2011/12 than 2008/09 by 289 per 100,000.

LHIN results

Table 15.2: Number and rate of ocular procedures (vitrectomy, laser photocoagulation) per 100,000 Ontarians with diabetes (age 18+) by LHIN, 2009/10-2011/12

	2009/10			2010/11			2011/12			Trend
		Rate per 100,000			Rate per 100,000			Rate per 100,000		
LHIN	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]	#	Crude	Age-adjusted[a]	
Erie St. Clair	1,403	2,921	2,926	1,474	2,877	2,876	2,010	3,700	3,664	▲
South West	1,361	2,152	**2,169**	1,151	1,694	**1,735**	1,204	1,670	**1,689**	▼
Waterloo Wellington	1,314	3,090	3,138	1,304	2,815	2,852	1,230	2,478	2,508	▼
HNHB	3,690	3,801	3,904	3,715	3,578	3,680	3,578	3,266	3,348	▼
Central West	4,719	7,509	**7,321**	4,862	7,089	**6,933**	5,066	6,851	**6,696**	▼
Mississauga Halton	3,988	5,541	5,468	4,212	5,368	5,311	4,434	5,275	5,251	▼
Toronto Central	2,565	3,419	3,524	2,372	2,961	3,041	2,434	2,871	2,954	▼
Central	3,544	3,060	3,081	3,906	3,128	3,155	3,991	2,984	3,006	▼
Central East	3,737	3,119	3,120	3,610	2,808	2,812	3,811	2,788	2,796	▼
South East	834	2,317	2,351	796	2,058	2,136	679	1,647	1,728	▼
Champlain	1,957	2,505	2,534	1,904	2,272	2,284	1,750	1,967	1,990	▼
North Simcoe Muskoka	1,103	3,905	4,009	1,046	3,446	3,497	813	2,511	2,553	▼
North East	1,560	3,090	3,104	1,606	2,983	2,962	1,493	2,630	2,652	▼
North West	830	4,179	4,130	743	3,501	3,441	460	2,039	1,986	▼
LHIN unknown	55	-	-	36	-	-	35	-	-	
ONTARIO	32,660	3,583	3,598	32,737	3,341	3,358	32,988	3,164	3,183	▼

a. Rates are age-adjusted to control for differences in age composition of population over time.
Lowest and highest rates are bolded.

- In 2011/12, the age-adjusted rate of ocular procedures varied considerably by LHIN. The rate in Central West LHIN (6,696 per 100,000 persons with diabetes) was four-times higher than the rate in the lowest LHIN (South West LHIN: 1,689 per 100,000).
- In all three reporting periods, the rate was lowest in the South West LHIN and highest in the Central West LHIN.
- The age-adjusted rate of ocular procedures among adults with diabetes was lower in 2011/12 than in 2008/9 in all LHINs (with the exception of Erie St. Clair LHIN).

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Appendices

Appendix A: Performance measures for future consideration

Appendix B: Technical notes for indicator calculations

Appendix A: Performance measures for future consideration

Table A1 below provides the list of 'core data elements' decided at a meeting of the Diabetes Expert Panel IM/IT Reference Group (meeting held September 22, 2008).

Table A1: IM/IT Reference Group

Final Registry Data Elements			
Rank for Population Management	**Core Data Elements**	**Population Indicators**	**Decisions**
1	**A1C**	**% of pts with ≥ 2A1C tests in prior year** **% of pts with A1C > 7** **Average A1C among registered patients**	These are the 3 most important Data Elements. Implementation should begin with these and gradually incorporate others
2	**Blood Pressure**	**% of pts with target blood pressure**	
3	**LDL Cholesterol**	**% of pts with LDL < 2**	
4	Current Smoker		
5	Waist Circumference		
6	Hypoglycemic Episodes		Eliminate – will be captured through patient reported data
7	Albumin-Creatinine Ratio (ACR)	% of pts with ACR screening	
8	Aspirin/ASA		
9	ACE inhibitor/ARB	% of pts with ACE/ARB recommendation in prior yr	
10	Statin or lipid therapy		
11	Foot Exam	% of pts with foot exam in prior 2 yrs	
12	Retinal Exam	% of pts with eye exam in prior 2 yrs % of pts with A1C, foot exam, eye exam, and ACE/ARB recommendation in prior 2 yrs	
13	Responsible Physician		
14	Self-Management Plan	% of pts with documented self management plan in past 12 months	

Table A2 provides information about the additional performance indicators that were proposed by the ODS Performance Measures group. These indicators were brought forward for review to the Expert Panel subgroup. There was agreement that these indicators are important, but not currently feasible due to the lack of reliable data for the entire population with diabetes. Although the feasibility of obtaining interim estimates for HbA1c and LDL-C levels through a linkage between data from the Ontario Lab Information System (OLIS) and the BDDI, such a linkage is not possible at this time. A preliminary review of the literature has been conducted for these additional measures to help identify baselines and guide the discussion of targets in the future.

Table A2: Overview of Performance Measures for Development

Indicator	Baseline	Population Targets for review
Blood pressure management (frequency) % of people with diabetes who have had blood pressure checked at least once in past year	**88%[1]**	*See note*
Blood pressure control % of people with diabetes with blood pressure <130/80 mmHb	**53%[2]**	**80%, with 10% annual improvement[4] or >75%[6] or >55%[7]**
Albumin to Creatinine Ratio (ACR) and Serum creatinine frequency % of people with diabetes who have had an ACR and serum creatinine test in the past year	**48%[8]**	*See note*
ACR control % of people with diabetes with ACR <2.0mg/mmol (for men) and <2.8mg/mmol (for women)	**-**	-
HbA1c control % of people with diabetes with HbA1c ≤7.0%	**47%[2] (age 18+)**	**80%, with 10% annual improvement[4] or 20% increase over 3 years[5].**
LDL control % of people with diabetes with LDL ≤2.0 mmol/L	**65.2%[3]**	**80%, with 10% annual improvement[4] or >65%[6]**

1. From Harris, 2003. Chart audit of 331 diabetes patients charts (Thames Valley Family Practice). Lipid profile documented in 48% of charts.
2. As reported in OHQC (CT Lamont Primary Health Care Research Centre, Comparisons of Models in Primary Health Care. Data collected 2004-2006)
3. From M. Stewart, 2008. Unpublished results taken from DELPHI project.
4. Majumdar SR, Johnson JA, Bowker SL, Booth GL, Dolovich L, Ghaki W, Harris SB, Hux JE, Holbrook A, Lee HN, Toth EL, Yale JF. A Canadian Consensus for the Standardized Evaluation of Quality Improvement Interventions in Type 2 Diabetes. Canadian Journal of Diabetes 2005; 29(3):220-229. . Consensus was that a 10% (or 15% or 20%) improvement would represent a clinically important or worthwhile outcome. Benchmark of 80% is what health systems should strive to achieve for patients (i.e., achieving the guideline for the indicator). For LDL control the potential target relates to <2.5mmol/L.
5. Diabetes Task Force, 2004. Report to the Ministry of Health and Long-Term Care. Ontario. September 2003.
6. Saskatchewan Quality Council, 2007. (>75% to achieve BP <130/80) Time frame for achieving target not specified.
7. QIIP Learning Measures Collaborative, 2008.
8. From Saskatchewan CDM Collaborative. Baseline ACR screening rate was increased from 48% to approx 74% after introduction of chronic disease management initiatives including web-based registry.

Note: There is no explicit recommendation for Blood Pressure or ACR frequency in the Clinical Practice Guidelines for diabetes (Canadian Diabetes Association 2008).

Appendix B: Technical notes for indicator calculations

<table>
<tr><td>Measure</td><td colspan="3">Diabetes Prevalence</td></tr>
<tr><td>Recommended Reporting Frequency</td><td>Quarterly or twice a year</td><td>Reporting Audience</td><td>ODS, Ministry of Health, LHINs, public</td></tr>
<tr><td>Data Source</td><td>Baseline Diabetes Database Initiative (BDDI), Ministry of Health and Long Term Care.

The BDDI was created by the Ministry using a validated algorithm to identify Ontario residents with diabetes, age 18+, as of January 1, 2010. The algorithm uses 10 years of physician claims and hospital inpatient data (OHIP and DAD), and 8.5 years of ambulatory/emergency dept data (NACRS) to identify potential diabetes patients. Individuals are identified as having diabetes if they have had at least one hospitalization or two physician service claims over a two-year period with a diabetes related diagnostic code. Women with gestational diabetes are not included.</td><td>Data Quality

Availability</td><td>The BDDI uses a validated methodology to identify individuals who likely have diabetes. There is no differentiation between Type I & II cases. The BDDI may miss some individuals including the small percent of the aboriginal population who decline provincial health insurance, RCMP, military personnel, veterans, and prison inmates.

The data sources used to create the BDDI (OHIP Claims data, DAD, NACRS) are available at the MOHLTC.</td></tr>
<tr><td>Calculation

Methodological notes</td><td colspan="3"><u># of people with diabetes, age 18+</u>
Total population age 18+

The denominator is based on population estimates (Ministry of Finance).

<u>BDDI</u>
The algorithm used to create the BDDI, identified all potential people with diabetes in Ontario as of January 1, 2010 (i.e. the total estimated number of people with diabetes). Patient lists were sent for validation to all Primary Care Providers (PCP) to confirm whether those identified by the algorithm as having diabetes did have diabetes and to allow PCPs to identify any patients with diabetes who may have been missed. The feedback from PCPs is used to establish a more refined prevalence estimate. The prevalence estimates continue to be revised and updated with each iteration of the BDDI process until the project closed in November 2012. The BDDI algorithm is as current as April 1, 2012.

<u>Prevalence</u>
Prevalence is calculated as of April 1 in a given year.
<u>It includes:</u>
1. Individuals identified as people with diabetes from the BDDI algorithm prior to April 1 of the given year;
2. Any individual identified solely through their PCP as a person with diabetes.
<u>It excludes:</u>
1. Individuals under age 18 at the start of the given year;
2. Individuals whose health number is not valid at the start of a given year (e.g. deceased, non-Ontario resident);
3. Individuals previously identified by their PCP as not having diabetes;
4. Individuals who opted out of BDDI.</td></tr>
</table>

Measure	*Diabetes Prevalence*
	LHIN level analysis is based on the LHIN of patient residence (i.e., results for Erie St. Clair are for all individuals with diabetes in Erie St. Clair regardless of the location of their primary care provider.)
Comments	Prevalence numbers from the MOHLTC BDDI are not the same as those previously reported by e-health BDDI, or those by the ICES Ontario Diabetes Database. This is because the diabetes status of persons previously included in diabetes prevalence estimates had not been validated. Diabetes prevalence numbers will change further as additional people are diagnosed with diabetes, physicians continue to review their diabetes patient lists and add or remove patients.

<table>
<tr><td>Measures</td><td colspan="3">% of the population who are physically inactive, age 18+
% of the population who are overweight or obese, age 18+</td></tr>
<tr><td>Recommended Reporting Frequency</td><td>Annual</td><td>Reporting Audience</td><td>ODS, Ministry of Health, LHINs, public</td></tr>
<tr><td>Data Source</td><td>Canadian Community Health Survey (CCHS) Ontario Share File.
The CCHS is a cross-sectional survey of household residents aged 12 or older conducted by Statistics Canada. The CCHS questionnaire, which is administered by telephone, asks questions related to health status, health care utilization and health determinants. The survey relies upon a large sample of respondents and is designed to provide reliable estimates at the health region level (i.e., LHINs and public health units). Data are collected by computer assisted person or telephone interviewing. The Ontario ‘share file’ consists of all respondents who agreed to share their data with the provincial ministries. The total Ontario samples in the share file are:
<table>
<tr><th>Cycle</th><th>Year</th><th>Sample</th></tr>
<tr><td>1.1</td><td>2001/02</td><td>37,681</td></tr>
<tr><td>2.1</td><td>2003/04</td><td>40,507</td></tr>
<tr><td>3.1</td><td>2005/06</td><td>39,486</td></tr>
<tr><td>4.1</td><td>2007</td><td>20,780</td></tr>
<tr><td>4.1</td><td>2008</td><td>21,020</td></tr>
<tr><td>-</td><td>2009</td><td>20,053</td></tr>
<tr><td>-</td><td>2010</td><td>20,350</td></tr>
<tr><td>-</td><td>2011</td><td>20,219</td></tr>
</table></td><td>Data Quality

Availability</td><td>Data for physical inactivity and overweight/obesity are based on self-reports and may be subject to recall errors, over and under reporting, social desirability, and errors associated with proxy reporting. Populations on Indian Reserves, Canadian Forces Bases and some remote areas are excluded from the survey.

Physical activity reflects leisure time physical activity but this may account for only a portion of total daily physical activity especially for individuals that have high levels of occupational physical activity.

Overweight/obesity in particular is known to be under-reported when based on self-reports.

Data are available annually starting in 2007. Previous cycles were released bi-annually beginning in 2001 (2001, 2003, 2005). There is typically a lag of 1 year between data collection and reporting (i.e., 2012 data will be available in fall 2013)</td></tr>
<tr><td>Calculation

Methodological notes</td><td colspan="3"><u>Weighted # of respondents age 18+ who reported being “Inactive” * 100</u>
Total # weighted respondents age 18+

Includes: Respondents age 18+ to PACDPAI=3 (Inactive) in numerator. Respondents age 18+ to PACDPAI= 1 through 3 (Active, Moderately active, Inactive) in denominator
Excludes: Respondents with Not applicable (6), Don’t know (7), Refusal (8), Not stated (9) to PACDPAI are excluded from the numerator and denominator.

<u>Weighted # of respondents age 18+ with a BMI >=25</u> * 100
Total # weighted respondents age 18+

Includes: Respondents age 18+ who responded to questions concerning height and weight.
Excludes: Respondents with Not applicable (6), Don’t know (7), Refusal (8), Not stated (9) to HWTDISW are excluded from the numerator and denominator. Those under the age of 18, pregnant or breastfeeding women, those less than 3 feet tall or over 7 feet tall are excluded from the numerator and denominator.

Estimates are weighted to represent the total Ontario population and 95% Confidence Intervals are provided to offer an estimation of the variability on the estimate. Confidence intervals are</td></tr>
</table>

Measures	***% of the population who are physically inactive, age 18+*** ***% of the population who are overweight or obese, age 18+***
	calculated using the bootstrap method and bootstrap weights provided by Statistics Canada.
Comments	Physical inactivity is determined from the derived variable PACDPAI (created by Statistics Canada) which appears in the CCHS file. The variable categorizes respondents as 'active', 'moderate', or 'inactive' based on total daily energy expenditure values (kcal/kg/day). These in turn are based on answers to a series of questions about participation in various types of leisure physical activities over the previous three months as well as frequency and duration. More intense activities are assigned higher 'metabolic equivalent' or MET values. Overweight/Obesity is based on Body Mass Index (BMI) - a measure of the respondent's weight relative to their height. BMI is calculated by dividing the respondent's weight in kilograms by their height in meters, squared. Height and weight are based on self-reported answer to the questions: hw_q2, *"How tall are you without shoes on?",* and hw_q3, "*How much do you weigh?*. Respondents are categorized as: Underweight (BMI < 18.5) Normal weight (BMI 18.5 to < 25.0) Overweight (BMI 25.0 to < 30.0) Obese – Class I (BMI 30.0 <= 34.9) Obese – Class II (BMI 35.0 <= 39.9) Obese – Class III (BMI >= 40.0) Statistics Canada creates and provides a derived variable "HWTDISW" in the CCHS data file based on responses to questions about height and weight.

<table>
<tr><td>Measure</td><td colspan="3">% of people age 18+ with diabetes who are attached (have a family doctor)</td></tr>
<tr><td>Recommended Reporting Frequency</td><td>Quarterly</td><td>Reporting Audience</td><td>ODS, Ministry of Health, LHINs, public</td></tr>
<tr><td>Data Source</td><td>Primary Care Access Survey

The PCAS is a voluntary, telephone survey developed by the Ministry of Health and Long- Term Care (MOHLTC) and conducted by the Institute for Social Research (ISR) at York University, Ontario. Since January 2006, the PCAS has surveyed the population age 16 and older in Ontario households every three months. For households with children, adult respondents provide information by proxy.

For the last eight waves of PCAS data, the sample size is:
<table>
<tr><th>Wave</th><th>Period</th><th>Sample</th></tr>
<tr><td>11</td><td>Jul 08 – Sep 08</td><td>2,165</td></tr>
<tr><td>12</td><td>Oct 08 – Dec 08</td><td>2,158</td></tr>
<tr><td>13</td><td>Jan 09 – Mar 09</td><td>2,145</td></tr>
<tr><td>14</td><td>Apr 09 – Jun 09</td><td>2,125</td></tr>
<tr><td>15</td><td>Jul 09 – Sep 09</td><td>2,141</td></tr>
<tr><td>16</td><td>Oct 09 – Dec 09</td><td>2,120</td></tr>
<tr><td>17</td><td>Jan 10 – Mar 10</td><td>2,156</td></tr>
<tr><td>18</td><td>Apr 10 – Jun 10</td><td>2,143</td></tr>
</table></td><td>Data Quality

Availability</td><td>Data for this indicator are self-reported and may be subject to recall errors, over and under reporting, social desirability, and errors associated with proxy reporting.

Baseline questions in the PCAS relating to access to primary care are based on similar questions in the Canadian Community Health Survey (CCHS). These questions were modified to improve the clarity of the definition of family doctors, and to reflect other areas of interest. The PCAS includes Ontario residents age 16 or older living in private households. Households without telephones; some households that utilize only cell phones, people living in some institutions and people who are unable to speak either English or French are excluded.

The MOHLTC receives new data every three months. Data are generally available for analysis approximately two months after the end of the data collection period. To increase the sample size, PCAS data for analysis are combined with the prior three quarters (waves) to create a rolling year of data.</td></tr>
<tr><td>Calculation

Methodological notes</td><td colspan="3"><u>Number of respondents age 18+ who reported they have diabetes & that they are attached to a family doctor</u> *100
Total # respondents age 18+ who reported they have diabetes+
Exclusions:
Respondents who did not report their age are excluded from analyses 'Don't know' and 'refused' responses are excluded from all analyses.

All estimates are weighted by household size and geography (LHIN) to account for the design characteristics of the survey. In order to reflect the population structure of Ontario’s LHINs, the estimates are post-stratified by sex and age group.</td></tr>
<tr><td>Comments</td><td colspan="3">People with diabetes are identified based on the question “Have you ever been told by a doctor or other health care professional that you have diabetes?”
Determining whether respondents are attached is based on the answers to 3 questions:
1) do you have a family doctor, family physician, GP or medical doctor?
2) (if no to q1) do you see any type of doctor for your health on a regular basis?
3) (if yes to q2) do you think of this doctor as your regular family doctor?</td></tr>
<tr><td>Comments</td><td colspan="3">Originally a target of 100% was proposed for this indicator. More recent discussions suggest this may have changed to reflect the fact that some proportion of the population will always be unattached (not looking for regular doctor, have a regular place of care, have moved etc.)</td></tr>
</table>

<table>
<tr><td>Measure</td><td colspan="3">Number of diabetes patients registered with Health Care Connect
Number of diabetes patients referred to Family Health Care Providers through Health Care Connect</td></tr>
<tr><td>Recommended Reporting Frequency</td><td>Quarterly</td><td>Reporting Audience</td><td>ODS, Ministry of Health and Long-Term Care</td></tr>
<tr><td>Data Source</td><td>Health Care Connect Database, Ministry of Health and Long-Term Care

Health Care Connect was launched in mid-February 2009. Unattached patients register with the program either via phone or online. Their registration is recorded in the Health Care Connect database. To be eligible to register, the patient has to have a valid Health Card Number and provide consent to the program. Registered patients are assigned to a LHIN-based Care Connector whose role is to refer the patients to Family Health Care Providers. Patients with high scores on the health status questionnaire administered at the time of registration are given priority in a referral process; this signifies high treatment needs.</td><td>Data Quality

Availability</td><td>Health Care Connect only captures information on patients who know about Health Care Connect, are willing to be registered with the program, and are actively seeking a family doctor. Therefore, the registration numbers are underestimates of the population without a regular family health care provider.

Data are updated daily and therefore allow for the quarterly reporting.</td></tr>
<tr><td>Calculation

Methodological notes</td><td colspan="3">Diabetes patients registered with Health Care Connect
Number of distinct patients (i.e. with unique Health Card Numbers) who registered with Health Care Connect within the reporting period. It includes patients whose registrations were subsequently terminated.

Diabetes patients referred to Family Health Care Providers through Health Care Connect
a. Number of distinct patients (i.e. with unique Health Card Numbers) who registered with Health Care Connect and were referred to a provider within the reporting period.
b. Referred (%):
$\frac{\textit{Number of people with diabetes who were registered and referred to family health care providers during a time period}}{\textit{Number of people with diabetes who registered during a time period}} \times 100$

Time period: Inception (February 5, 2009) to July 31, 2012.

Analysis is performed on the Extract-to-Load (ETL) file. The file is created daily from the HCC data tables and contains point-in-time data. For this report, the ETL file created on April 22, 2010 was used.</td></tr>
<tr><td>Comments</td><td colspan="3">For patients registering more than one time during the reporting period, the first registration was included.
For patients referred more than one time during the reporting period, the first referral was included.</td></tr>
</table>

Measure	***% of people with diabetes for whom Q040, K030 or any management code was claimed in past year***		
Recommended Reporting Frequency	Quarterly or twice a year (to coincide with BDDI reporting to primary care providers)	**Reporting Audience**	ODS, Ministry of Health, LHINs, public
Data Source	Baseline Diabetes Database Initiative (BDDI), Ministry of Health and Long Term Care. The BDDI was created by the Ministry using a validated algorithm to identify Ontario residents with diabetes, age 18+, as of January 1, 2010. The algorithm uses 10 years of physician claims and hospital inpatient data (OHIP and DAD), and 8.5 years of ambulatory/emergency dept data (NACRS) to identify potential diabetes patients. Individuals are identified as having diabetes if they have had at least one hospitalization or two physician service claims over a two-year period with a diabetes related diagnostic code. Women with gestational diabetes are not included.	**Data Quality** **Availability**	The BDDI uses a validated methodology to identify individuals who likely have diabetes. There is no differentiation between Type I & II cases. The BDDI may miss some individuals including: the small percent of the aboriginal population who decline provincial health insurance, RCMP, military personnel and veterans, prison inmates. The data sources used to create the BDDI (OHIP Claims data, DAD, NACRS) are available at the MOHLTC. OHIP claims can be as much as 6 months old. A patient may have received a service as much as 6 months ago that has not yet been billed or has not yet been approved for payment.
Calculation ***Methodological notes***	**a) <u># of people with diabetes, age 18+, for whom Q040 was billed at least once in past yr</u>** **Total # people with diabetes, age 18+** **b) <u># of people with diabetes, age 18+, for whom K030 was billed at least once in the past yr</u>** **Total # people with diabetes, age 18+** **c) <u># of people with diabetes, age 18+, for whom any management code* was billed at least once in the past yr</u>** **Total # people with diabetes, age 18+** <u>*Baseline Diabetes population:*</u> Denominator for rates=Total # of people with diabetes, age 18+, as identified in BDDI and adjusted based on feedback from PCPs who reviewed BDDI patient lists, received as of mid-August 2010, (N=961,204). Analysis of Q040/K030 is based on claims submitted as of July 1, 2010, where service date of claim is between Jan 1, 2009 and Dec 31, 2009. <u>*Diabetes populations 2009/10 to 2010/11:*</u> Denominator for rates= Total # of people with diabetes, age 18+ as of the start of the fiscal year (prevalence). Analysis of Q040/K030 is based on claims submitted as of Apr 2012, where service date of claim is between Apr 1, 2009 and Mar 31, 2011. *Any management code includes Q040 and K030 as well as the two new management codes K045 (by Specialist) introduced in Oct 2010 and K046 (by Team) introduced in Sept 2011. LHIN level analysis is based on the LHIN of patient residence (i.e., results for Erie St. Clair are for all individuals with diabetes who live in Erie St. Clair regardless of the location of their primary care provider.)		
Comments	K030A is a Diabetes Management Assessment (DMA) code implemented in April 2002. It has a maximum of 4 per patient per 12 month period. Q040A is a Diabetes Management Incentive code introduced in April 2006 for signatory primary care physicians (PEM physicians). As of April 2009 all family physicians can bill the Q040 fee code.		

Measure	***% of people with diabetes who received an HbA1c test in the past 6 months*** ***% of people with diabetes who received an LDL-C test in the past year***		
Recommended Reporting Frequency	Quarterly or twice a year (to coincide with BDDI reporting to primary care providers)	**Reporting Audience**	ODS, Ministry of Health, LHINs, public
Data Source	Baseline Diabetes Database Initiative (BDDI), Ministry of Health and Long Term Care. The BDDI was created by the Ministry using a validated algorithm to identify Ontario residents with diabetes, age 18+, as of January 1, 2010. The algorithm uses 10 years of physician claims and hospital inpatient data (OHIP and DAD), and 8.5 years of ambulatory/emergency dept data (NACRS) to identify potential diabetes patients. Individuals are identified as having diabetes if they have had at least one hospitalization or two physician service claims over a two-year period with a diabetes related diagnostic code. Women with gestational diabetes are not included.	**Data Quality** **Availability**	The BDDI uses a validated methodology to identify individuals who likely have diabetes. There is no differentiation between Type I & II cases. The BDDI may miss some individuals including the small percent of the aboriginal population who decline provincial health insurance, RCMP, military personnel, veterans, and prison inmates. <u>Lab tests for HbA1c and LDL-C:</u> Only includes A1C and LDL-C tests conducted in community labs. Lab tests for A1C or LDL-C conducted in hospitals are not individually submitted and therefore cannot be analysed for diabetes patients. According to a research study conducted in Eastern Ontario, 15% of diabetes-related tests were carried out in hospital labs (Van Walraven C and Raymond M, 2003). Furthermore, there may be gaps in the completeness of lab test data from a small number of rural labs. These labs are located in Winchester, Fergus, Huntsville & Bracebridge. Although these labs account for less than 1% of all submitted lab services, it may impact the testing rates for physicians in these communities. The data sources used to create the BDDI (OHIP Claims data, DAD, NACRS) are available at the MOHLTC. OHIP claims can be as much as 6 months old. A patient may have received a service as much as 6 months ago that has not yet been billed or has not yet been approved for payment.
Calculation ***Methodological notes***	**<u># of people with diabetes, age 18+, with at least 1 A1C test within past 6 months *100</u>** **Total # people with diabetes, age 18+** **<u># of people with diabetes, age 18+, with at least 1 LDL-C test within past year*100</u>** **Total # people with diabetes, age 18+**		

<table>
<tr><td>Measure</td><td>% of people with diabetes who received an HbA1c test in the past 6 months
% of people with diabetes who received an LDL-C test in the past year</td></tr>
<tr><td></td><td><u>Baseline Diabetes population:</u> Denominator for rates=Total # of people with diabetes, age 18+, as identified in BDDI and adjusted based on feedback from PCPs who reviewed BDDI patient lists, received as of mid-August 2010, (N=961,204) Analysis of A1C, LDL-C tests based on claims submitted as of July 1, 2010. For A1C, service date of claim is between July 1, 2009 and Dec 31, 2009. For LDL-C, service date of claim is between Jan 1, 2009 and Dec 31, 2009.

<u>Diabetes populations as of April 1:</u> Denominator for rates= Total # of people with diabetes, age 18+ as of the start of the fiscal year (prevalence). For A1C, service date of claim is between October 1, 2009 and Mar 31, 2012. For LDL-C, service date of claim is between April 1, 2009 and March 31, 2012. For both indicators are retrospective in that the 6 month or 1 year period prior to the start of the fiscal year is used for reporting.

<table>
<tr><td>Test</td><td>Fee Schedule Code selection</td></tr>
<tr><td>A1C</td><td>L093</td></tr>
<tr><td>LDL</td><td>L055, L117, L243 billed on same day</td></tr>
</table>

LHIN level analysis is based on the LHIN of patient residence derived from patient’s postal code (i.e., results for Erie St. Clair are for all individuals with diabetes in Erie St. Clair regardless of the location of their primary care provider).</td></tr>
<tr><td>Comments</td><td>Reference: Population-based study of repeat laboratory testing. Van Walraven C, Raymond M. Clinical Chemistry. 2003, 49(12): 1997-2005.</td></tr>
</table>

Measure	*% of people with diabetes who received Retinal Eye Exam in the past 2 years*		
Recommended Reporting Frequency	Quarterly or twice a year (to coincide with BDDI reporting to primary care providers)	**Reporting Audience**	ODS, Ministry of Health, LHINs, public
Data Source	Baseline Diabetes Database Initiative (BDDI), Ministry of Health and Long Term Care. The BDDI was created by the Ministry using a validated algorithm to identify Ontario residents with diabetes, age 18+, as of January 1, 2010. The algorithm uses 10 years of physician claims and hospital inpatient data (OHIP and DAD), and 8.5 years of ambulatory/emergency dept data (NACRS) to identify potential diabetes patients. Individuals are identified as having diabetes if they have had at least one hospitalization or two physician service claims over a two-year period with a diabetes related diagnostic code. Women with gestational diabetes are not included.	**Data Quality** <

Measure	*% of people with diabetes who received Retinal Eye Exam in the past 2 years*
	LHIN level analysis is based on the LHIN of patient residence derived from patient's postal code (i.e., results for Erie St. Clair are for all individuals with diabetes in Erie St. Clair regardless of the location of their primary care provider).
Comments	Approximately half of all retinal eye exam claims were submitted by optometrists and half by ophthalmologists.

Measure	**Historical analysis by Institute for Clinical Evaluative Sciences (ICES); 2002/03-2007/08** ***Renal replacement therapy rates*** ***Infection, ulcer, amputation rates*** ***Heart attack (Acute myocardial infarction) rates***		
Recommended Reporting Frequency	Annual	**Reporting Audience**	ODS, Ministry of Health, LHINs, public
Data Source	**Historical analysis:** Ontario Diabetes Database (ODD), Institute for Clinical Evaluative Science (ICES). The ODD, maintained at ICES, employs a validated algorithm to identify people with diabetes using data on hospitalizations (DAD and NACRS), and physician claims (CHDB). Individuals are captured on ODD if they have had at least one hospitalization or two physician service claims over a two-year period with a diagnostic code for diabetes. The ODD does not differentiate between Type I or Type II diabetes, and may include individuals with 'pre-diabetes'. Individuals with gestational diabetes are excluded. Records remain on ODD until death or migration out of the province.	**Data Quality**	The ODD does not differentiate between Type I or Type II diabetes, and may include individuals with 'pre-diabetes'. Individuals with gestational diabetes are excluded. Records remain on ODD until death or migration out of the province. Renal replacement: The number of diabetes patients receiving chronic dialysis may be underestimated. Some patients receiving treatment outside the province, or from providers in an alternate funding plan may be missed. Infections, Amputations: The coding of hospitalization records for amputations has been found to be accurate. DAD records may undercount amputations in the northwest area of the province where specialty services may be referred to Winnipeg. AMI: The coding of hospitalization records for AMI has been found to be accurate. DAD records may undercount AMI episodes in the northwest area of the province where specialty services may be referred to Winnipeg. DAD records will undercount AMI episodes where an AMI resulted in death before admission to hospital.
		Availability	Analyses can be updated annually.
Calculation ***Methodological notes***	**Renal replacement therapy numerator: # of people with diabetes, age 18+, receiving dialysis + # of people who received kidney transplant during a fiscal year** **Infections + Amputations numerator: # of hospitalizations for common or soft tissue infections, major or minor amputations among people with diabetes age 18+ during a fiscal year** **AMI numerator: # of hospitalizations for AMI among people with diabetes, age 18+, during a fiscal year**		

<table>
<tr><td>Measure</td><td>Historical analysis by Institute for Clinical Evaluative Sciences (ICES); 2002/03-2007/08
Renal replacement therapy rates
Infection, ulcer, amputation rates
Heart attack (Acute myocardial infarction) rates</td></tr>
<tr><td></td><td>Denominator for historical analysis = Total # of people with diabetes, age 18+ for 2002/03-2008/09, as identified in ODD

All rates are age/sex standardized using the direct method to adjust for differences in the age/sex structure of a population over time or place.
LHIN level rates are based on LHIN of patient residence.

<table>
<tr><th>Indicator</th><th>Selection Criteria</th></tr>
<tr><td>Renal Replacement Therapy (includes dialysis and kidney transplantation)</td><td><u>Dialysis:</u>
OHIP fee codes: R849, R850, G323, G325, G326, G860, G862, G863, G865, G866, G330, G331, G332, G861, G864, G082, G083, G085, G090, G091, G092, G093, G094, G095, G096, G294, G295, G333
DAD CCI: 1PZ21HQBR, 1PZ21HPD4
<u>Kidney transplant</u>
DAD CCI: 1PC85LAXXJ, 1PC85LAXXK</td></tr>
<tr><td>Infections + Amputations (includes urinary tract, pneumonia, bacteremia/sepsis, and skin/soft tissue infections; major and minor amputations)</td><td>DAD, dxtype = M: N300, N308, N309, N10, N12, N390, J110, J12, J13, J14, J15, J16, J17, J18, A40, A41, A499, A394
DAD CCI: 1VC93x, 1VG93x, 1VQ93x, 1WA93x, 1WE93x, 1WJ93x, 1WL93x, 1WM93x

NB: For amputations, records with certain diagnosis codes are excluded (e.g., amputations for malignant neoplasms). Contact Health Analytics Branch for details.</td></tr>
<tr><td>Acute myocardial infarction (AMI)</td><td>DAD dxtype=M, 1
I21</td></tr>
</table>
</td></tr>
<tr><td>Comments</td><td>Analysis provided by Institute for Clinical Evaluative Sciences.</td></tr>
</table>

<table>
<tr><td>Measure</td><td colspan="3">BDDI based analysis (MOHLTC); 2008/09-2011/12
Renal replacement therapy rates
Infection, ulcer, amputation rates
Heart attack (Acute myocardial infarction) rates
Emergency department visits for hyper or hypoglycemia
Ocular complication rates (vitrectomy & laser photocoagulation procedures)</td></tr>
<tr><td>Recommended Reporting Frequency</td><td>Quarterly or twice a year (to coincide with BDDI reporting to primary care providers)</td><td>Reporting Audience</td><td>ODS, Ministry of Health, LHINs, public</td></tr>
<tr><td>Data Source</td><td>Baseline Diabetes Database Initiative (BDDI), Ministry of Health and Long Term Care.

The BDDI was created by the Ministry using a validated algorithm to identify Ontario residents with diabetes, age 18+, as of January 1, 2010. The algorithm uses 10 years of physician claims and hospital inpatient data (OHIP and DAD), and 8.5 years of ambulatory/emergency dept data (NACRS) to identify potential diabetes patients. Individuals are identified as having diabetes if they have had at least one hospitalization or two physician service claims over a two-year period with a diabetes related diagnostic code. Women with gestational diabetes are not included.</td><td>Data Quality

Availability</td><td>The BDDI uses a validated methodology to identify individuals who likely have diabetes. There is no differentiation between Type I & II cases. The BDDI may miss some individuals including the small percent of the aboriginal population who decline provincial health insurance, RCMP, military personnel, veterans, and prison inmates.

The data sources used to create the BDDI (OHIP Claims data, DAD, NACRS) are available at the MOHLTC. OHIP claims can be as much as 6 months old. A patient may have received a service as much as 6 months ago that has not yet been billed or has not yet been approved for payment.</td></tr>
<tr><td>Calculation

Methodological notes</td><td colspan="3"><u>Renal replacement therapy numerator:</u> # of people with diabetes, age 18+, receiving dialysis or kidney transplant during a fiscal year

<u>Infections + Amputations numerator:</u> # of hospitalizations for common or soft tissue infections, major or minor amputations among people with diabetes age 18+ during a fiscal year

<u>AMI numerator:</u> # of hospitalizations for AMI among people with diabetes, age 18+, during a fiscal year

<u>Emergency dept visits for hyper/hypoglycemia numerator:</u> Number of emergency visits for hyperglycemia or hypoglycemia by diabetes patients age 18+ during a fiscal year

<u>Ocular procedures numerator</u>: # of vitrectomy and laser photocoagulation procedures among people with diabetes age 18+ during a fiscal year

Denominator for all rates = Total # of people with diabetes, age 18+ as of the start of the fiscal year (prevalence).

<table>
<tr><td>Indicator</td><td>Selection Criteria</td></tr>
<tr><td>Renal Replacement Therapy (includes dialysis and kidney transplantation)</td><td><u>Dialysis:</u>
OHIP fee codes: R849, R850, G323, G325, G326, G860, G862, G863, G865, G866, G330, G331, G332, G861, G864, G082, G083, G085, G090, G091, G092, G093, G094, G095, G096, G294, G295, G333
DAD/NACRS CCI: 1PZ21HQBR, 1PZ21HPD4
<u>Kidney transplant</u>
DAD/NACRS CCI: 1PC85LAXXJ, 1PC85LAXXK</td></tr>
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<tr><td>Measure</td><td>BDDI based analysis (MOHLTC); 2008/09-2011/12
Renal replacement therapy rates
Infection, ulcer, amputation rates
Heart attack (Acute myocardial infarction) rates
Emergency department visits for hyper or hypoglycemia
Ocular complication rates (vitrectomy & laser photocoagulation procedures)</td></tr>
<tr><td></td><td>
<table>
<tr><td>Infections + Amputations (includes urinary tract, pneumonia, bacteremia/sepsis, and skin/soft tissue infections; major and minor amputations)</td><td>DAD, dxtype = M, 1; N300, N308, N309, N10, N12, N390, J110, J12, J13, J14, J15, J16, J17, J18, A40, A41, A499, A394
Skin/soft tissue infections:
DAD, dxtype=M, 1; L01, L02, L03, L04, L05, L08, A480, E1051, E1151, E1351, E1451, E1061,E1161, E1361, E1461, R02
Amputations:
DAD CCI: 1VC93, 1VG93, 1VQ93, 1WA93, 1WE93, 1WJ93, 1WL93, 1WM93

NB: For amputations, records with certain diagnosis codes are excluded (e.g., amputations for malignant neoplasms). Details available on request.</td></tr>
<tr><td>Acute myocardial infarction (AMI)</td><td>DAD dxtype=M, 1
I21</td></tr>
<tr><td>ED visits for hyper/hypoglycemia</td><td>Includes unscheduled emergency visits (i.e. AM case type = EMG), with main problem diagnosis as hyperglycemia or hypoglycemia.
Excludes visits with both a hyperglycemia and a hypoglycemia diagnosis.
For hyperglycemia: ICD10 code of main problem diagnosis = E101, E110, E111, E130, E131, E140, E141, or R739
For hypoglycemia: ICD10 code of main problem diagnosis = E15^, E160, E161, E162, E1063, E1163, E1363, E1463</td></tr>
<tr><td>Ocular complications (procedures)</td><td>OHIP fee codes (feesuff = A)
E154 (Photocoagulation)
E148 (Vitrectomy)</td></tr>
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LHIN level rates are based on LHIN of patient residence.
All rates are age/sex standardized using the direct method to adjust for differences in the age/sex structure of a population over time or place.</td></tr>
<tr><td>Comments</td><td></td></tr>
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