

***Assessing Value in Ontario Health Links. Part 5:
Health System Performance Trends in Health
Links Populations: 2012-2014***

Health System Performance Research Network

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Executive Summary

Context

Ontario's Health Links program was announced by the Ministry of Health and Long-Term Care (MOHLTC) in December 2012 as a provincial strategy to improve care coordination for patients with complex conditions and social needs. Each Health Link consists of multiple clinical and social service providers in a defined geography, and has the flexibility to create their own strategies to identify target populations and integrate care for these individuals. As of July 2016, there were 82 Health Links in operation across all 14 Local Health Integration Networks (LHINs). The first set of 22 Health Links were initiated in late August 2013 and are often referred to as the "early adopters". Health Links are led by varied organizations, such as hospitals, Family Health Teams, Community Care Access Centres, Community Health Centres, and community support agencies, in single- or co-leadership models.

Objective

The objective of this report is to describe the health system performance trends for the Health Links target population between 2012 and 2014. We analyze selected health system performance indicators for all currently approved Health Links. This information provides comparative performance data against which outcomes for patients enrolled in Health Links can be compared.

Methods

Using health administrative data at the Institute for Clinical Evaluative Sciences (ICES), we identified all individuals alive in the Registered Persons Database at the midpoints (September 30) of 2012 and 2014 who met the MOHLTC "Health Links target population" criteria: an Ontario resident under 105 years of age with a valid OHIP card and an active diagnosis of 4 or more priority conditions within the last 1-year period. Each condition was identified from multiple health administrative data sources. All Ontarians identified in the 2012 and 2014 study populations were assigned to a Health Link (n=82). Multiple characteristics were recorded for each Health Link, including rurality, level of material deprivation, lead organizations type, and early adopting status. Consistent with previous evaluations, 7 indicators were selected to represent important outcomes of health system performance: (1) Health care expenditures; (2) Acute (all-cause) hospitalizations; (3) Low acuity Emergency department visits; (4) All Emergency department visits; (5) Readmissions within 30 days for select case mix groups; (6) Post-discharge primary care 7-day follow-up; and (7) enrolment of patients in a primary care model. For each indicator, we compared the performance in Health Links in 2014 relative to 2012.

Findings

A total of 514,848 individuals (3.9% of the Ontario population eligible from the RPDB) were included in the 2012 Health Links Target Population, and 546,450 (4.0%) were included for 2014. Within most Health Links, the age and sex characteristics were similar between the 2012 and 2014 target populations, where there were a greater proportion of women and older adults (ages 65 or older).

Considering the full target population, there were statistically significant improvements from 2012 to 2014 in total costs per month alive (1% inflation-adjusted reduction), low acuity ED visits (10% reduction), and primary care follow-up within 7-days after a CMG-related hospitalization (2% increase).

Total ED visit rates worsened, increasing by 4% in the target population. For healthcare expenditures, a one percent savings in the target population amounts to approximately \$300 per person-year on the absolute (dollar) scale. This suggests that if all eligible high-cost patients (546,450 individuals with 4+ chronic conditions) were enrolled into Health Links care, the average annual health system savings would be a maximum of \$164 million. As of March 2015, the end of our study period, an estimated \$30 million had been invested into the Health Links program from the MOHLTC, suggesting a positive return on investment.

At the Health Link level, a high degree of variability was observed in most indicators, including variability among Health Links within the same LHINs. In addition, no clear patterns of high or low performance at the Health Link level were directly observable. In other words, no one Health Link, or groups of Health Links, was consistently a high or low performer across the set of indicators that were quantified.

Conclusions

This report describes longitudinal trends from 2012 to 2014 of high-cost, high-needs patients affiliated with 82 Health Link catchment areas as identified by health administrative data, considering 7 important indicators reflective of health system performance. We found that there were no clear patterns of high or low performance directly observable at the Health Link level, or when stratified by notable Health Link characteristics. However, important findings from this research include a reduction in health system costs in the complex high need patient population of Ontario, particularly in the acute care sector, as well as opportunities to increase enrolment of these patients to primary care models of care. As the Health Link programs evolve and care coordination is optimized according to local needs, it is expected that greater improvements will be observed with additional prospective follow-up time.

Table of Contents

Acknowledgements.....	i
Executive Summary.....	ii
Table of Contents.....	iv
List of Tables and Figures.....	v
Context.....	1
Objectives	1
Methods.....	2
Target Population	2
Health Links.....	2
Indicators	3
Data Analysis.....	4
Findings	5
Limitations	14
Conclusions	15
References	17
Appendix 1: Selected Conditions for Target Populations and Disease Prevalence	18
Appendix 2: Population Pyramids for 2012 and 2014 Target Populations.....	20
Appendix 3: Full indicator estimates for 2012 and 2014, by Health Link	21

List of Tables and Figures

Table 1: Health Link (n=82) Characteristics	6
Table 2: Relative Change in Indicators in 2014 (vs. 2012), by Health Link	10
Table 3: Relative Change in Indicators in 2014 (vs. 2012), by Health Link Deprivation Quintile.....	13
Table 4: Relative Change in Indicators in 2014 (vs. 2012), by Health Link Rurality	13
Table 5: Relative Change in Indicators in 2014 (vs. 2012), by Health Link Lead Organization Type.....	13
Table 6: Relative Change in Indicators in 2014 (vs. 2012), by Early vs Later Adopting Health Links	13
Table 7: Relative Change in Health Care Expenditures in 2014 (vs. 2012), by Sector	14

Context

Ontario's Health Links program was announced by the Ministry of Health and Long-Term Care (MOHLTC) in December 2012 as a provincial strategy to improve care coordination for patients with complex conditions and social needs. Each Health Link consists of multiple clinical and social service providers and has the flexibility to create their own strategies to integrate care and identify target populations. While the "low-rules" approach has received mixed feedback from the leaders and providers across Health Links and Local Health Integration Networks (LHINs), the principle recognizes that innovative improvements are more likely to be developed locally in complex systems, such as the health system (Evans, Grudniewicz et al. 2014).

The first set of 22 Health Links were initiated in late August 2013 and are often referred to as the "early adopters". As of July 2016, there were 82 Health Links in operation across all 14 LHINs (MOHLTC 2016). Health Links are led by various organizations, such as hospitals, Family Health Teams, Community Care Access Centres, Community Health Centres, and community support agencies, in single- or co-leadership models.

This report builds on our prior research on Health Links in Ontario. In response to an Applied Health Research Question from the MOHLTC Transformation Secretariat in 2014, the Health System Performance Research Network (HSPRN) investigated the evolution of the Health Links program from an evaluation perspective and has published a series of reports on "Assessing Value in Ontario Health Links". In the first report, the mechanisms by which the United States Accountable Care Organizations define and measure value were described, and a working framework for assessing value in Health Links was proposed (Mery and Wodchis 2014). In the second report, the findings from interviews with Health Links leaders were summarized to identify the perceived value at present and the anticipated value in the long term (Mery, Kromm et al. 2015). The third report provided an empirical evaluation of the baseline currently approved Health Links on the selected indicators using health administrative databases, considering two populations of interest: all Ontarians, and the top 5% high-cost users in Ontario (Kromm, Mondor et al. 2015). The fourth report described the health care use and health system costs associated with palliative and end-of-life care populations located within Health Link catchment areas. Palliative and end-of-life individuals consume a substantial portion of the provincial health care budget and thereby constitute a potential target population of the Health Links program (Mondor, Tanuseputro et al. 2016).

Objectives

In this report we describe the health system performance trends for the Health Links target population in 2014 relative to 2012 (the baseline year when the Health Links program was launched in Ontario), considering multiple indicators of health system performance among the recently defined 'target population' (4 or more conditions). To do so, we used linked, encoded health care data housed at the Institute for Clinical Evaluative Sciences (ICES) in Toronto, Ontario. Here, we focus on the MOHLTC-recommended target population of individuals with multiple (four or more) high-cost conditions (MOHLTC

2015), thereby evaluating population-level changes among potential Health Link patients. At the time of writing, complete administrative data were available until the end of fiscal year 2014.

Methods

Target Population

For each of fiscal years 2012 and 2014, we derived mid-year population estimates from the Registered Persons Database (RPDB). Individuals were included for analysis based on the MOHLTC definition of “Health Links target population”: an Ontario resident under 105 years of age with a valid OHIP card and an active diagnosis within the last 1-year period of 4 or more conditions from a list of 55 priority conditions. A list of the 55 conditions, including prevalence estimates for the 2012 and 2014 target populations included in this report, can be found in **Appendix 1**. The average health care costs for this target population exceeds \$21,000 per year, which is more than 17 times the average annual costs for those with less than 4 priority conditions (MOHLTC 2015). Each condition was identified from multiple data sources, including the Discharge Abstract Database (DAD), National Ambulatory Care Reporting System (NACRS), Ontario Mental Health Reporting System (OMHRS), National Rehabilitation Reporting System (NRS), Continuing Care Reporting System (Complex Continuing Care and Long-Term Care), Home Care Database (HCD), and Ontario Health Insurance Program (OHIP) physician billings database.

Health Links

All Ontarians identified in the 2012 and 2014 study populations were assigned to a Health Link (n=82) based on the following three criteria in a descending order of priority. First, they were assigned based on the location of their rostered provider of primary care. Second, patients who were not enrolled in a primary care model were assigned based on the location of the most visited primary care physician in the last 2 years. Third, for all remaining patients in the study population, individuals were assigned based on the location of their home residence. All individuals not assigned to a Health Link (not located within one of the 82 geographically defined Health Link catchment areas) with this methodology were identified as “Not assigned to a HL” for analyses. The location of a patient’s primary care physician was prioritized in assigning Ontarians to a Health Link because some patients may reside in one Health Link region but receive care from their physician based in another region, which is often seen in urban areas.

We derived multiple characteristics for each Health Link, including level of rurality, level of material deprivation, lead organizations type, and early adopting status. The median 2008 Rurality Index of Ontario (RIO) score among all Ontarians assigned to a Health Link was used to categorize Health Link as either urban ($RIO < 10$), suburban ($10 \leq RIO < 40$), or rural ($RIO \geq 40$) (Kralj 2009). The level of material deprivation was derived from the Ontario Marginalization (ON-Marg) Material Deprivation Index, a frequently used area-level marker of socio-economic status (Matheson, Dunn et al. 2012). Each Health Link was categorized into 1 of 5 equal-sized groups (quintiles) based on its weighted ON-Marg deprivation score and ranked from 1 (least deprived Health Link regions) to 5 (most deprived Health Link regions). We also derived the lead organization for each Health Link (MOHLTC 2016). From this list, each Health Link was then grouped into 1 of 5 mutually exclusive categories, including Community Care Access Centre (CCAC), Community Health Centre (CHC), Family Health Team (FHT), Hospital, or Other which included all

non-CHC or –CCAC community services agencies, mental health agencies, public health agencies, as well as organizations co-led by multiple agencies (a Hospital and FHT, for example). Finally, we identified the 22 early adopting Health Links.

Indicators

Building on our initial evaluation of Health Links using health administrative data, we quantified seven indicators of health system performance:

1. Health care expenditures (\$ cost per month alive): defined as the total direct health care cost incurred in the public health care system (i.e., paid for by public insurance) per person-month. The costs were derived across multiple sectors, including: inpatient hospitalizations (acute and mental health), emergency care, same day surgery, physician billings (fee-for-service (FSS) and non-FSS), prescription medications, laboratory, rehabilitation, complex continuing care, long-term care, home care, and assisted devices. The estimates were adjusted for age and sex and represent predicted values based on a negative binomial regression model (with age and sex as independent variables). We used 2012 prices as a multiplier for all services. The values are therefore reported in 2012 Canadian dollars.
2. Acute (all-cause) hospitalizations (per 100,000 population): defined as the total number of hospital separations (including discharges, transfers, and deaths) during a year per total population (APHEO 2015). Only acute care episodes are considered, and external causes of hospitalization and admissions to psychiatric hospitals are excluded from the numerator. The estimates are (direct) standardized by age and sex to the 1991 Canadian population and presented per 100,000 population.
3. Emergency department visits – Low Acuity (per 100,000 population): defined as the total number of unplanned visits to Emergency Departments (ED) designated as low acuity according to the Canadian Triage and Acuity Scale (CTAS) levels IV (less urgent) and V (non-urgent) per total population (MOHLTC 2013). Only visits that did not result in a hospital admission were considered. The estimates are (direct) standardized by age and sex to the 1991 Canadian population and presented per 100,000 population.
4. Emergency department visits – All CTAS levels (per 100,000 population): defined as the total number of unplanned visits to EDs, including all CTAS levels, per total population. Only visits that did not result in a hospital admission were considered. The estimates are (direct) standardized by age and sex to the 1991 Canadian population and presented per 100,000 population.
5. Case-mix group (CMG) 30-day readmission rate (%): defined as the percentage of patients with an acute inpatient stay for cardiac conditions (excluding heart attack), congestive heart failure, chronic obstructive pulmonary disease, pneumonia, diabetes, stroke, or gastrointestinal disease that have a subsequent non-elective acute (all-cause) readmission within 30 days of discharge (MOHLTC 2012). Each index condition is identified using the case-mix group (CMG) methodology. The estimates are risk adjusted by fitting a logistic regression model with CMG, age, sex, prior

hospitalizations (within 1,2, and 3 month), annual quarter, and Charlson comorbidity score as covariates.

6. Case-mix group primary care 7-day follow-up (%): defined as the percentage of patients with an acute inpatient stay for cardiac conditions (excluding heart attack), congestive heart failure, chronic obstructive pulmonary disease, pneumonia, diabetes, stroke, or gastrointestinal disease that have a primary care follow-up visit within 7 days of discharge. Visits to physicians with a main specialty in family practice, general practice, or paediatrics were considered. The estimates are presented as crude (unadjusted) proportions. This indicator was selected to assess appropriate care transitions following hospital discharge.
7. Patients enrolled in a primary care model (%): defined as the proportion of individuals formally rostered to a primary care physician. The estimates are derived as of the mid-point of each year. The estimates are (direct) standardized by age and sex to the 1991 Canadian population and presented as a proportion.

These measures were selected from a wider list of health indicators, reflecting a parsimonious set which represent important outcomes that are either 1) relevant to all patients enrolled in a Health Links program of care (as opposed to indicators with age- or condition-specific inclusion criteria), or 2) that are deemed to be high priority by Health Link leaders (i.e., readmissions and primary care follow-up after acute discharge). Where applicable, indicators are presented as directly standardized estimates or risk-adjusted estimates. These methods enable comparability between Health Links with differing age and sex compositions, but also within Health Links over time. The 1991 Canadian population is used as the standard population for all direct standardization, and therefore these estimates are equivalent to the rates that each Health Link would have experienced if they had the same age-sex distribution as the 1991 Canadian population. As such, crude and standardized values often differ. Both adjusted and unadjusted values are therefore presented in the **Appendices**.

Data Analysis

For each fiscal year (2012 and 2014), we derived 1-year estimates for each indicator and tested for statistical differences for each Health Link compared to that of the overall Ontario target population value. Longitudinal trends were assessed within each Health Link unit by comparing their 2014 estimate to the baseline (2012) values. Resultant values are presented on a relative scale, where trend values >1 can be interpreted as a percent increase (e.g. 1.1 is a 10% increase) in the indicator among individuals in that Health Link unit, trend values <1 as a percent decrease, and a value of 1 as no change. Statistically significant trends were identified based on non-overlapping 95% confidence limits between 2012 and 2014 values. The high-performing Health Links (colour coded green) and the poor performing Health Links (colour coded red) were identified for each indicator based on these statistically significant differences. We repeated these analyses considering Health Links aggregated by level of rurality, level of material deprivation, lead organizations type, and early adopting status.

Ethical approval for this work was granted by the Institutional Review Board at Sunnybrook Health Sciences Centre in Toronto, Canada.

Findings

A total of 514,848 individuals (3.9% of the Ontario population eligible from the RPDB) were included in the 2012 Health Links Target Population, and 546,450 (4.0%) were included for 2014. The most prevalent conditions in these cohorts were hypertension (62.0% in 2012, 61.6% in 2014), arthritis (47.0%/ 46.9%), diabetes (38.3%/ 39.0%), anxiety (36.9%/ 36.0%), and malignant neoplasms (24.3%/ 25.0%). The complete list of prevalence estimates for each target population is shown in **Appendix 1**. The median age (interquartile range, IQR) of the 2012 cohort was 70 (57-81) years and 54.5% were women. For the 2014 cohort, median (IQR) age was also 70 (58-81) years and 54.3% were women. Figures highlighting the age-sex distribution of the 2012 and 2014 overall target populations are presented in **Appendix 2**. Most individuals identified were assigned to one of the 82 Health Links; 60,468 (11.7%) were not assigned to a Health Link in 2012, and 63,537 (11.6%) were not assigned to a Health Link in 2014. For both cohorts (2012 and 2014), 5% of the identified population died within 1 year of the April 1st index date.

Table 1, presented on pages 6 and 7, shows the list of 82 Health Links included in this analysis, including the chosen characteristics (early adopters, material deprivation quintile, lead organization type, and rurality), the total number of Ontarians in the 2012 and 2014 Target Populations assigned to each Health Link unit, as well as summary demographic information. Target population sizes for Health Links ranged from 697-17,897 individuals in 2012 and from 687-18,990 individuals in 2014. For both years, most Health Links had a greater proportion of women than men, and were comprised generally of older adults (ages 65-plus). Within most Health Links, the age and sex characteristics were similar between the 2012 and 2014 target populations.

Table 1: Health Link (n=82) Characteristics

Health Link	Material Depriv. Quintile	Lead Org Type	Rurality	2012			2014		
				Target Population Size (n)	Women (%)	Median Age (IQR)	Target Population Size (n)	Women (%)	Median Age (IQR)
-Not Assigned to a Health Link-				60,468	54.2	69 (57-80)	63,537	53.8	69 (57-80)
LHIN 1: Erie St. Clair									
Chatham Kent HL	5	CHC/Hosp	Suburban	2,099	57.3	73 (59-82)	2,610	54.1	71 (58-82)
Essex County South Shore HL	3	Hosp	Suburban	2,571	55.1	74 (62-84)	2,798	55.9	75 (63-85)
Lambton County Lake Huron HL	3	CHC/FHT	Suburban	6,221	53.8	72 (59-81)	6,184	54.7	72 (61-82)
LHIN 2: South West									
Huron Perth HL*	2	FHT	Rural	4,701	56.5	75 (62-84)	4,943	54	74 (62-84)
London Middlesex HL	3	FHT	Urban	17,062	54.9	70 (57-82)	18,990	54.6	71 (58-81)
North Grey Bruce HL	4	Hosp/FHT	Rural	3,399	53	74 (61-83)	3,307	52.8	74 (62-83)
South Grey Bruce HL	2	CHC/FHT	Rural	1,775	51.5	74 (62-83)	1,823	51	74 (62-83)
LHIN 3: Waterloo Wellington									
Cambridge and North Dumfries HL	3	CHC	Urban	4,862	52.7	69 (57-80)	5,014	53.9	70 (57-80)
Guelph HL*	2	FHT	Urban	4,159	52.9	72 (57-83)	4,365	54.7	72 (58-83)
Kitchener Waterloo HL	2	FHT	Urban	9,826	53	71 (58-82)	10,587	54	71 (58-82)
Rural Wellington HL	1	FHT	Suburban	2,711	52	73 (61-83)	2,803	53.1	73 (61-83)
LHIN 4: HNIB									
Brant Six Nations HL	4	Hosp	Urban	5,104	56	71 (58-82)	5,137	54.7	72 (59-82)
Burlington HL	1	CCAC	Urban	7,652	55.7	73 (59-82)	8,436	55.6	72 (59-82)
Haldimand HL	3	Hosp	Suburban	1,901	52.7	71 (58-81)	1,962	53.2	71 (58-81)
Hamilton Central HL*	5	FHT/other	Urban	8,767	54.3	69 (56-80)	9,477	53.7	68 (56-80)
Hamilton East HL	3	Hosp	Urban	6,819	55.5	73 (60-82)	8,735	55.5	72 (59-82)
Hamilton West HL	2	Hosp	Urban	6,540	58.9	72 (58-82)	6,620	58.3	71 (58-82)
Niagara North East HL	3	CCAC	Urban	10,323	54.3	71 (58-81)	11,149	54.8	71 (58-81)
Niagara North West HL	1	Hosp	Suburban	2,270	52.8	72 (58-81)	2,271	53.6	72 (59-82)
Niagara South East HL	4	Hosp	Urban	5,549	53.8	71 (59-82)	6,118	53.7	71 (59-82)
Niagara South West HL	5	CHC	Urban	3,914	53.9	73 (61-82)	4,123	55.3	73 (62-83)
Norfolk HL	4	Hosp	Suburban	2,677	54.2	72 (60-82)	2,786	54.3	72 (61-82)
LHIN 5: Central West									
Bolton Caledon HL	1	Other	Urban	1,578	53.9	68 (56-78)	1,718	54.4	69 (56-79)
Bramalea and Area HL	2	Hosp	Urban	6,343	52.5	65 (53-75)	7,271	52.5	65 (53-75)
Brampton and Area HL	3	Hosp	Urban	8,352	54.3	65 (53-77)	9,572	52.8	66 (53-76)
Dufferin and Area HL*	1	Hosp	Suburban	1,821	53.3	69 (57-80)	1,859	55.1	70 (56-80)
N Etobicoke, Malton, W Woodbridge HL*	5	CCAC	Urban	7,291	51.7	68 (55-78)	8,400	52.2	67 (55-78)
LHIN 6: Mississauga Halton									
East Mississauga HL*	2	FHT	Urban	12,636	54.3	69 (56-79)	13,930	53.9	68 (56-79)
Halton Hills HL	2	FHT/other	Urban	1,957	52.8	69 (53-80)	1,915	53.8	70 (56-81)
Milton HL	1	FHT/other	Urban	2,005	54.8	65 (51-77)	2,302	53.5	66 (51-77)
North West Mississauga HL	1	FHT/other	Urban	5,539	55.8	67 (54-78)	5,778	55.9	67 (55-78)
Oakville HL	1	FHT/other	Urban	7,354	53.9	71 (57-81)	7,842	53.6	71 (58-81)
South Etobicoke HL	2	CHC	Urban	4,456	54.9	74 (60-83)	5,052	55	73 (59-83)
South West Mississauga HL	1	CCAC	Urban	4,456	53.6	70 (57-80)	5,171	54	69 (56-80)
LHIN 7: Toronto Central									
Central West Toronto HL	5	Other	Urban	3,287	51.4	71 (58-79)	3,333	50.8	71 (58-80)
Don Valley/Greenwood HL*	4	Other	Urban	6,010	49.8	66 (52-78)	5,774	52.9	69 (56-79)
East Toronto HL*	3	FHT	Urban	7,634	55.3	70 (56-81)	7,683	53.9	69 (56-81)
Mid East Toronto HL*	1	CHC	Urban	4,835	46	62 (50-74)	5,065	48.8	63 (50-75)
Mid West Toronto HL*	1	FHT	Urban	16,326	55.1	68 (56-79)	17,587	54.7	68 (56-79)
North East Toronto HL	1	Hosp	Urban	6,399	58.6	73 (58-83)	6,444	57.8	73 (60-84)
North West Toronto HL	1	Hosp	Urban	5,551	57.7	75 (61-85)	5,578	55.8	75 (62-85)
South Toronto HL	3	Hosp	Urban	7,383	55.6	70 (57-82)	6,918	55	70 (58-82)
West Toronto HL	3	CCAC	Urban	3,088	56.9	74 (59-85)	2,721	57.1	72 (58-84)

Notes: * indicates early adopter Health Links; Material Deprivation Quintile 1=Most Affluent, 5=Most Deprived

Health Link	Material Depriv. Quintile	Lead Org Type	Rurality	2012			2014		
				Target Population Size (n)	Women (%)	Median Age (IQR)	Target Population Size (n)	Women (%)	Median Age (IQR)
LHIN 8: Central									
North York Central HL*	2	Hosp	Urban	17,897	56.2	73 (60-83)	18,564	55.7	73 (60-83)
North York West HL	5	CHC	Urban	13,328	52.6	71 (57-80)	13,884	52.9	70 (57-80)
S Simcoe and N York Region HL*	1	Hosp	Suburban	9,989	55.4	69 (56-81)	11,357	55.9	70 (57-81)
Southeast York Region HL	2	Hosp	Urban	8,128	54.5	69 (57-79)	9,006	55.3	70 (58-80)
Southwest York Region HL	1	Hosp	Urban	15,572	54.4	71 (58-80)	18,198	54.2	70 (58-80)
LHIN 9: Central East									
Durham North East HL	3	CCAC	Urban	12,041	54.9	70 (56-81)	11,878	54.5	70 (57-81)
Haliburton and Kawartha Lakes HL	4	CCAC	Suburban	3,622	53.6	75 (63-83)	3,584	53.4	75 (63-83)
Northumberland HL	2	CCAC	Suburban	2,764	52.1	74 (64-84)	2,818	53.6	74 (63-83)
Peterborough HL*	4	CCAC	Suburban	6,652	53.7	72 (60-82)	6,790	53.6	72 (61-83)
Scarborough North HL	4	CCAC	Urban	7,895	52.8	72 (60-81)	8,277	52.9	72 (60-82)
Scarborough South HL	4	CCAC	Urban	15,379	54.3	69 (56-80)	17,008	54	68 (56-80)
LHIN 10: South East									
Kingston HL*	3	FHT	Urban	6,529	56.8	69 (55-80)	6,820	56	69 (56-81)
Quinte HL*	4	CHC	Suburban	5,357	54.3	71 (59-81)	5,249	54.3	72 (60-82)
Rideau Tay HL	5	CHC	Suburban	1,814	54.5	75 (63-83)	1,824	56.1	75 (63-84)
Rural Hastings HL*	4	CHC/Other	Rural	2,257	53.3	71 (60-80)	2,347	51.3	72 (62-81)
Rural Kingston HL*	3	FHT	Suburban	697	49.9	71 (58-81)	805	48	70 (59-80)
Salmon River HL	4	CHC	Suburban	895	54.5	73 (61-83)	975	52.9	72 (60-82)
Thousand Islands HL*	4	FHT	Suburban	3,518	54.7	69 (56-80)	3,383	56	70 (57-81)
LHIN 11: Champlain									
Arnprior Region and Ottawa West HL	1	Hosp/other	Urban	4,201	56.5	69 (57-80)	4,693	53.5	69 (57-80)
Central Ottawa HL	2	CHC	Urban	15,266	56.7	72 (58-83)	14,922	56	71 (58-82)
North Renfrew County HL	3	Hosp	Rural	2,411	56.4	72 (59-82)	2,559	55.9	72 (59-82)
Prescott-Russell Regional HL	5	CCAC	Rural	2,367	55.5	71 (58-82)	2,272	52.2	71 (58-82)
South Ottawa and North Grenville HL	2	CHC	Urban	4,698	58.7	71 (57-82)	5,677	55.5	71 (57-82)
South Renfrew HL	5	Hosp	Rural	1,734	55.8	72 (61-82)	1,861	55.2	73 (61-83)
SGCA HL	5	Hosp	Suburban	3,620	54.7	73 (61-83)	3,705	54	72 (61-82)
Upper Canada HL	1	Hosp	Suburban	2,108	53	72 (59-82)	2,730	54.9	72 (59-82)
LHIN 12: North Simcoe Muskoka									
Barrie Community HL*	2	FHT	Urban	5,655	54.1	72 (57-82)	6,263	55.5	71 (57-82)
Couchiching Community HL	4	FHT	Suburban	3,169	53.6	73 (61-82)	3,256	53.1	73 (61-83)
Muskoka Community HL	3	Other	Rural	2,643	53	74 (61-83)	2,724	52.5	73 (61-82)
North Simcoe Community HL	5	CHC	Rural	2,675	53.6	70 (57-80)	2,635	53.7	71 (59-81)
South Georgian Bay Community HL*	2	FHT	Suburban	2,592	50.1	73 (63-81)	2,909	52.6	74 (63-82)
LHIN 13: North East									
Nipissing East Parry Sound HL	5	Hosp	Suburban	4,312	55.7	71 (59-81)	4,335	55.1	72 (59-81)
North Cochrane HL	5	CHC/FHT	Rural	926	54.1	67 (56-77)	866	50.3	69 (57-79)
Sault Ste. Marie HL	5	Other	Suburban	3,971	54.6	72 (60-82)	4,440	54.9	72 (60-82)
Temiskaming HL*	5	CHC	Rural	1,481	54.5	72 (62-81)	1,409	52.6	73 (62-82)
Timmins HL*	5	FHT	Suburban	2,811	53.6	68 (56-79)	2,963	52.7	68 (56-79)
LHIN 14: North West									
City of Thunder Bay HL	4	CCAC	Urban	6,643	55.4	72 (59-82)	6,348	54.1	72 (59-82)
District of Rainy River HL	3	Hosp	Rural	741	53	73 (60-83)	687	57.2	73 (61-83)
District of Thunder Bay HL	5	Hosp	Rural	819	51.9	66 (55-77)	741	47.6	66 (57-76)

Notes: * indicates early adopter Health Links; Material Deprivation Quintile 1=Most Affluent, 5=Most Deprived ; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Table 2 (pages 10 and 11) shows the relative change in indicator estimates, for the selected indicators, at the Health Link level. Details of each 2012 and 2014 Health Link estimate, including crude and adjusted values for each of 2012 and 2014, can be found in the **Appendix 3**.

Key Findings:

- Considering all Ontarians included in the Health Links Target Population, there were statistically significant improvements in total costs per month alive (1% reduction), low acuity ED visits (10% reduction), and primary care follow-up within 7-days after a CMG-related hospitalization (2% increase) in 2014, relative to 2012. Only ED visit rates (all CTAS levels) worsened, increasing by 4% in the target population. No other significant differences (positive or negative) were found for the other indicators in the total population (all cause hospitalizations, hospital 30-day readmissions, and primary care enrollment).
- For the Target Population that were not assigned to 1 of the 82 Health Links, values for each of the indicators were no different between 2012 and 2014 at a $p < 0.05$ criterion, except for ED visit rates (all CTAS levels) which increased 4%. For this indicator, this population was statistically higher than the Ontario population average in both 2012 and 2014.
- The statistically significant 1% reduction in total costs per month alive in the Ontario target population corresponded with an absolute decrease of \$25 per person-month (mean change from \$2,108 in 2012 to \$2,083 in 2014). This equates to approximately \$300 per person-year and \$164 million per year considering the whole target population.
 - Across the 82 Health Links, age-sex adjusted expenditure trends statistically increased in 1 Health Link (Essex County HL, 13% increase) and statistically decreased in 2 Health Links (Hamilton East HL 10% decrease, Barrie Community HL 7% decrease). No other trends across the Health Links were significant.
- For acute hospitalizations, age-sex standardized trends decreased among 5 Health Links and increased among 11 Health Links.
 - Notably, the range in relative change was from a 37% increase (North Cochrane HL) to a 26% decrease (Timmins HL). These Health Links are both in the North East LHIN.
- The rate of low acuity ED visits statistically decreased in more than half of the Health Links ($n=43$), corresponding with the 10% decrease in the overall population.
 - There was a wide range in performance, from a 45% decrease (Stormont, Glengarry, Cornwall, and Akwesasne Health Link) to a 51% increase (South Georgian Bay Community Health Link).

- In contrast, only 15 Health Links had statistically lower rates of ED visits (all CTAS levels) in 2014 than in 2012, while the rate increased in 35 Health Links.
 - Trends varied from a 23% improvement (Stormont, Glengarry, Cornwall, and Akwesasne Health Link) to a 43% increase (Upper Canada HL). Both of these Health Links are within the Champlain LHIN.
- A large variability was observed for 30-day hospital CMG readmission trends across the Health Links from a 32% decrease to a 40% increase. Most Health Links saw no statistical difference in trends.
 - Only 1 Health Link worsened (North West Mississauga, 40% increase) and 2 improved (Upper Canada at 32% and Kingston at 22%).
- Similarly, most Health Links underwent no change in the proportion of patients seen by a primary care physician within 7 days of discharge from a CMG-related hospitalization. Although changes ranged from a 10% decrease to 50% increase, trends were statistically significant only in three Health Links:
 - Cambridge and North Dumfries (50% improvement), Niagara North West (29%), and Hamilton East (24%). Two of these Health Links are in the Hamilton Niagara Haldimand Brant LHIN.
- The proportion of patients formally rostered with a family physician (i.e., enrolled in a primary care model) remained unchanged statistically in all Health Links except two:
 - Don Valley/Greenwood increased rostering by 9%; Central West Toronto decreased rostering by 21%. Both Health Links are within the Toronto Central LHIN.

Table 2: Relative Change in Indicators in 2014 (vs. 2012), by Health Link

Health Link	Costs	Hosps.	ED visits (Low Acuity)	ED Visits (All CTAS)	CMG Readmit.	CMG Followup	Enrolment
Overall	0.99	1.00	0.90	1.04	0.99	1.02	1.00
-Not Assigned to HL-	0.99	0.97	0.98	1.04	0.99	1.00	0.97
LHIN 1: Erie St. Clair							
Chatham Kent HL	0.91	0.85	1.19	1.06	0.95	1.05	0.93
Essex County South Shore HL	1.13	1.06	0.67	0.97	0.93	1.06	1.05
Lambton County Lake Huron HL	1.02	1.16	0.93	1.05	0.97	0.98	1.01
LHIN 2: South West							
Huron Perth HL*	1.02	0.92	0.87	0.94	0.85	1.07	1.00
London Middlesex HL	0.98	0.92	0.83	0.97	0.96	0.92	0.97
North Grey Bruce HL	1.00	1.04	0.95	0.96	1.00	1.11	1.05
South Grey Bruce HL	0.97	0.98	0.93	1.01	0.80	1.50	1.00
LHIN 3: Waterloo Wellington							
Cambridge and North Dumfries HL	0.95	0.96	1.11	1.12	1.10	1.01	1.01
Guelph HL*	1.01	0.97	0.69	0.93	1.19	0.98	0.94
Kitchener Waterloo HL	1.01	1.10	1.15	1.27	1.25	1.02	1.01
Rural Wellington HL	1.02	0.91	1.01	1.10	0.98	1.04	1.03
LHIN 4: HNIB							
Brant Six Nations HL	1.05	1.15	1.26	1.21	1.04	1.12	0.99
Burlington HL	0.98	1.05	0.75	1.04	1.02	1.09	1.03
Haldimand HL	1.00	1.21	0.76	0.93	1.26	1.18	1.07
Hamilton Central HL*	0.97	1.12	1.26	1.20	1.10	1.08	1.05
Hamilton East HL	0.90	0.86	1.06	1.01	1.04	1.24	1.08
Hamilton West HL	0.96	0.98	0.85	0.90	0.93	1.00	1.01
Niagara North East HL	0.98	0.91	0.55	0.86	0.93	0.99	0.96
Niagara North West HL	1.04	1.05	0.81	0.91	1.03	1.29	0.98
Niagara South East HL	0.99	1.05	0.80	1.17	0.82	1.04	0.99
Niagara South West HL	0.99	1.04	0.92	1.11	0.96	1.12	1.04
Norfolk HL	0.98	0.79	0.74	0.89	1.12	0.93	0.95
LHIN 5: Central West							
Bolton Caledon HL	0.96	0.99	1.25	1.22	1.39	1.02	1.08
Bramalea and Area HL	1.06	0.97	0.66	1.03	1.00	1.05	0.96
Brampton and Area HL	0.95	1.02	0.77	1.19	1.02	1.03	0.99
Dufferin and Area HL*	1.10	1.18	1.04	1.08	1.08	1.18	0.93
N Etobicoke, Malton, W Woodbridge HL*	0.95	1.13	0.98	1.10	0.78	1.13	1.03
LHIN 6: Mississauga Halton							
East Mississauga HL*	0.94	0.95	1.01	1.10	1.03	1.05	1.04
Halton Hills HL	0.94	0.91	0.70	0.93	1.13	1.20	0.98
Milton HL	1.01	1.18	0.99	1.16	1.12	1.00	0.98
North West Mississauga HL	1.00	1.03	0.81	0.97	1.40	0.99	1.05
Oakville HL	0.99	1.01	0.68	0.96	1.08	1.09	1.00
South Etobicoke HL	0.96	0.97	1.18	1.17	1.12	1.04	1.04
South West Mississauga HL	0.94	1.01	0.81	0.96	0.93	0.92	0.98
LHIN 7: Toronto Central							
Central West Toronto HL	0.96	0.92	1.13	1.07	1.03	1.09	0.79
Don Valley/Greenwood HL*	1.04	1.15	0.84	0.99	1.05	1.05	1.09
East Toronto HL*	1.00	1.02	0.79	0.93	0.89	0.92	1.03
Mid East Toronto HL*	1.08	1.07	0.64	0.92	1.09	1.12	0.98
Mid West Toronto HL*	1.00	1.14	0.92	1.06	1.07	0.97	0.98
North East Toronto HL	1.01	1.03	1.20	1.16	0.94	0.95	1.05
North West Toronto HL	0.93	0.78	1.04	1.08	0.99	1.07	0.99
South Toronto HL	0.98	0.92	0.81	0.90	0.98	0.97	0.95
West Toronto HL	0.98	1.06	0.89	0.87	1.06	0.91	0.89

Notes: * indicates early adopter Health Links

Health Link	Costs	Hosps.	ED visits (Low Acuity)	ED Visits (All CTAS)	CMG Readmit.	CMG Followup	Enrolment
Overall	0.99	1.00	0.90	1.04	0.99	1.02	1.00
LHIN 8: Central							
North York Central HL*	1.02	1.08	0.88	1.07	1.03	1.05	0.96
North York West HL	1.00	0.92	0.89	1.10	0.90	0.94	1.03
S Simcoe and N York Region HL*	1.00	1.01	1.03	1.16	1.02	0.93	0.95
Southeast York Region HL	1.00	0.98	0.89	0.99	1.01	0.95	0.98
Southwest York Region HL	1.00	0.98	0.82	1.11	0.95	1.01	1.01
LHIN 9: Central East							
Durham North East HL	1.00	1.16	1.05	1.07	1.11	0.92	0.95
Haliburton and Kawartha Lakes HL	1.05	1.10	0.83	0.96	1.20	1.02	1.08
Northumberland HL	1.01	1.04	1.17	1.01	1.04	1.00	1.02
Peterborough HL*	0.96	1.04	1.04	1.06	1.06	1.10	0.96
Scarborough North HL	1.05	0.93	0.85	1.07	0.85	1.06	1.04
Scarborough South HL	0.98	1.04	0.91	1.07	0.93	1.01	0.99
LHIN 10: South East							
Kingston HL*	0.98	1.07	1.10	1.14	0.78	1.02	0.96
Quinte HL*	0.98	0.94	1.16	1.12	0.85	1.03	0.97
Rideau Tay HL	1.00	0.91	0.68	0.89	0.92	1.09	0.92
Rural Hastings HL*	0.96	1.10	1.06	1.14	1.06	0.94	1.03
Rural Kingston HL*	1.04	0.96	0.79	0.89	0.93	1.16	1.04
Salmon River HL	0.97	0.99	0.78	0.94	1.09	0.98	1.02
Thousand Islands HL*	1.03	0.93	0.65	1.00	0.97	1.11	1.01
LHIN 11: Champlain							
Arnprior Region and Ottawa West HL	0.96	1.02	0.73	0.93	0.87	1.17	1.00
Central Ottawa HL	0.99	0.97	0.91	1.09	1.01	0.99	0.99
North Renfrew County HL	0.95	1.01	0.77	0.99	0.96	0.91	1.05
Prescott-Russell Regional HL	1.02	1.20	0.68	0.88	1.04	0.94	1.00
South Ottawa and North Grenville HL	1.05	1.14	1.01	1.24	1.01	0.95	1.05
South Renfrew HL	0.98	0.97	0.85	0.98	1.10	1.13	0.90
SGCA HL	0.97	0.99	0.55	0.77	0.95	0.96	0.98
Upper Canada HL	0.94	0.87	1.16	1.43	0.68	1.04	1.03
LHIN 12: North Simcoe Muskoka							
Barrie Community HL*	0.93	1.01	1.13	1.22	1.07	1.03	1.05
Couchiching Community HL	0.99	1.01	0.76	0.94	0.99	1.26	1.07
Muskoka Community HL	0.99	1.13	0.85	1.06	1.05	1.09	1.09
North Simcoe Community HL	1.01	1.06	0.99	1.11	0.98	0.90	1.00
South Georgian Bay Community HL*	1.03	1.01	1.51	1.31	1.11	0.96	0.99
LHIN 13: North East							
Nipissing East Parry Sound HL	1.03	0.97	0.74	1.02	1.02	1.00	0.92
North Cochrane HL	1.05	1.37	0.78	1.03	0.79	0.90	1.07
Sault Ste. Marie HL	0.92	1.00	1.15	1.29	0.96	1.22	1.10
Temiskaming HL*	0.99	0.98	0.80	0.80	1.12	0.94	1.21
Timmins HL*	0.98	0.74	0.88	0.86	0.91	1.05	1.00
LHIN 14: North West							
City of Thunder Bay HL	1.02	0.96	0.85	0.98	0.90	1.06	1.01
District of Rainy River HL	1.01	1.12	1.14	1.17	0.80	1.16	1.08
District of Thunder Bay HL	1.11	1.18	1.23	1.22	0.82	1.38	1.00

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Tables 3-6 (page 13) show the relative change in indicator estimates, for the selected indicators, across Health Links aggregated by material deprivation quintile, rurality, lead organization type, and by early adopter status.

Key Findings:

- Performance across indicators did not correspond with material deprivation (**Table 3**); within each indicator, performance did not increase or decrease monotonically with increasing levels of deprivation. Moreover, neither the most deprived group nor the least deprived group consistently outperformed the other quintiles across the indicator set. Rather, results were indicator-driven (i.e., statistical significance was driven in large part by the change overall in the target population, for each indicator).
- Costs decreased statistically (2%) in urban Health Links (**Table 4**). The only other statistically significant trends were observed for ED visits: rates of low acuity ED visits decreased in all strata, but rates of all CTAS ED visits increased in all but 1 stratum (rural HLs). As above, these findings are largely driven by trends at the overall population level.
- Similar to the above groupings, rates of low acuity ED visits decreased in all lead organization types (**Table 5**), but rates of all CTAS ED visits increased in all but 1 stratum (here, CCAC-led HLs). Other statistically significant differences that were observed in analyses, stratified by lead organization type, included: increasing all-cause hospitalization rates (CCAC and Other HL organizations); increasing primary care follow-up within 7 days following a hospital discharge (Hospital and Other HL organizations); and increasing primary care enrolment (Other HL organizations).
- For early adopters (n=22), overall changes in indicator performance were no different in 2014 compared to 2012, except for low acuity ED visits (14% decrease) and (all CTAS levels) ED visits (3% increase). Mean health expenditures and post-discharge follow-ups decreased (improved) for later adopters, but all-cause hospitalization rates increased among the latter group (**Table 6**).

Table 3: Relative Change in Indicators in 2014 (vs. 2012), by Health Link Deprivation Quintile

Health Link: Deprivation Quintile	Costs	Hosps.	ED visits (Low Acuity)	ED Visits (All CTAS)	CMG Readmit.	CMG Followup	Enrolment
Overall	0.99	1.00	0.90	1.04	0.99	1.02	1.00
Q1 Most Affluent	0.99	1.02	0.88	1.05	1.01	1.02	1.00
Q2	0.99	1.00	0.88	1.05	1.04	1.03	1.01
Q3	0.98	1.00	0.94	1.08	0.97	0.99	1.00
Q4	1.00	1.00	0.87	1.00	0.96	1.06	0.99
Q5 Most Deprived	0.98	1.02	0.89	1.03	0.96	1.04	1.01

Table 4: Relative Change in Indicators in 2014 (vs. 2012), by Health Link Rurality

Health Link: Rurality	Costs	Hosps.	ED visits (Low Acuity)	ED Visits (All CTAS)	CMG Readmit.	CMG Followup	Enrolment
Overall	0.99	1.00	0.90	1.04	0.99	1.02	1.00
Rural HLs	1.00	1.05	0.87	0.99	0.95	1.04	1.03
Suburban HLs	1.00	0.99	0.90	1.04	0.99	1.05	0.99
Urban HLs	0.98	1.01	0.89	1.04	1.00	1.02	1.00

Table 5: Relative Change in Indicators in 2014 (vs. 2012), by Health Link Lead Organization Type

Health Link: Lead Org Type	Costs	Hosps.	ED visits (Low Acuity)	ED Visits (All CTAS)	CMG Readmit.	CMG Followup	Enrolment
Overall	0.99	1.00	0.90	1.04	0.99	1.02	1.00
CCAC	0.98	1.04	0.85	0.99	0.96	1.02	0.99
CHC	0.99	0.99	0.90	1.07	1.00	1.00	1.01
FHT	0.99	0.99	0.91	1.04	0.99	1.00	1.00
Hospital	0.99	0.99	0.87	1.05	0.98	1.03	0.99
Other	0.98	1.06	0.90	1.04	1.04	1.09	1.03

Table 6: Relative Change in Indicators in 2014 (vs. 2012), by Early vs Later Adopting Health Links

Health Link: Early Adopters	Costs	Hosps.	ED visits (Low Acuity)	ED Visits (All CTAS)	CMG Readmit.	CMG Followup	Enrolment
Overall	0.99	1.00	0.90	1.04	0.99	1.02	1.00
Later	0.99	1.04	0.94	1.05	0.99	1.03	1.00
Early Adopter	0.99	1.00	0.86	1.03	1.00	1.03	1.00

Supplemental Cost Analysis

To further explore the cost results, supplemental analyses of the cost per month indicator reveal differences in the relative change by healthcare sector. These figures are highlighted in **Table 7**. As in our primary analyses, costs are presented in 2012 Canadian dollars. In the target population, costs for inpatient care decreased (driving the overall 1% reduction), despite the overall all-cause hospitalization rate remaining constant over the same period (**Table 2**). In contrast, cost for other sectors - namely physician billings, long-term and home care, as well as prescription drugs - increased over the follow-up period. This suggests that the costs associated with care for the complex, high-needs population of Ontario are being shifted away from the acute setting to the community.

Table 7: Relative Change in Health Care Expenditures in 2014 (vs. 2012), by Sector

Sector	2012	2014	Relative Change
Inpatient Care	\$639	\$592	0.93
Physician Billings ¹	\$259	\$277	1.07
Long-Term Care and Home Care	\$501	\$517	1.03
Prescription Drugs	\$210	\$223	1.06
Other ²	\$450	\$440	0.98

¹Physician billings include fee-for-service plus all shadow billings

²Other includes same day surgery, emergency department, cancer and dialysis (NACRS), rehabilitation, complex continuing care, and mental health hospitalizations

Limitations

There are some limitations to this work. First, at the time of writing there were no registries of Health Link patients linked to health administrative data that were available for research (i.e this report). This report therefore describes the longitudinal trends in health system performance for Ontarians identified as high-cost/ high-need (4 or more conditions from a list of 55), and ascribed to a defined Health Link geographic catchment area based on their primary care provider's practice location. We do not quantify the performance of Health Links with regard to enrolled patients. A registry that could be linked to health administrative data would enable studies on the effect of the Health Links program in improving patient outcomes and reducing system costs, as well as the evaluation of health system use among Ontarians enrolled in the Health Links program, relative to similar complex patients not enrolled in Health Links. This is an anticipated area of future research for the HSPRN. Second, the indicators examined in this report were only those that were measurable with health administrative data. Other metrics, such as patient experience and access to services, would provide a more comprehensive evaluation to health system performance in relation to the Health Links program but are not widely available given the current data. Third, many of the Health Links discussed in this report were initiated after 2012 (later adopters), which compromises the validity of comparisons of indicator performance across the Health Links from baseline (2012). The findings for 'later adopting' Health Links, in particular, should therefore be interpreted with this in mind.

Conclusions

Despite these limitations, this report describes 2-year longitudinal trends of high-cost, high-needs patients affiliated with 82 Health Link catchment areas across 7 indicators reflective of health system performance. There are a few key messages resulting from the analyses. At the Health Link level, no clear patterns of high or low performance were directly observable. In other words, no one Health Link, or Health Links characteristic was consistently associated with high or low performance across the set of indicators that were quantified. Some of the statistical significance that we observed in longitudinal trends was indicator-driven. For example, many Health Links were considered 'high performing' for low acuity ED visits, but low acuity ED visits in non-Health Links regions had decreased by nearly 10% in the province over the 2-year period for this high-cost patient population. Similarly, many Health Links were considered 'poor performers' for all CTAS-levels ED visits, a finding possibly driven by the 4% increase in rates in the province among all multimorbid/high-cost patients. For indicators where little or no change was observed between 2012 and 2014 at the provincial level (CMG 30-day readmissions and primary care enrolment in particular), few trends were statistically significant at the Health Link-level. It is plausible, however, that a 2-year follow-up period was insufficient in achieving statistical significance for many of these indicators, which are highly stable at the population level.

Second, there was generally a wide variability in estimates of each indicator at the Health Link level, including variability among Health Links within the same LHIN. In our previous analyses of palliative and end-of-life indicators across 67 defined Health Links, similar findings were observed. This variability indicates that there is a potential for improvement for many Health Links and highlights the need to focus attention to the areas where performance is sub-optimal. By implementing quality standards and sharing best practices across Health Links, as well as by addressing the specific local needs, improvement in overall performance may be possible.

Our analyses show that from 2012 to 2014, total health system costs decreased by 1% in the target population, or by approximately \$300 per person-year on the absolute scale. This suggests that if all applicable high-cost patients were enrolled into Health Links care, the average annual health system savings would be a maximum of \$164 million (\$300 per person-year x 546,450 individuals). As of March 2015, the end of our study period, an estimated \$30 million had been invested into the Health Links program from the MOHLTC, suggesting a positive return on investment.

The results reported here also highlight opportunities to improve enrolment to primary care providers for the complex, high-needs patient population of Ontario. Approximately 80% (crude estimate, 73% when standardized to the 1991 Canadian population) of this population were rostered with a family physician in 2012, and this percent increased by a non-significant degree over the 2 year follow-up. In contrast, approximately 74% of the full population of Ontario was enrolled in a primary care model with their primary care provider in 2012. An increase in this primary care enrolment may be important given that primary care physicians are core members of the Health Links team, engaged in developing a coordinated care plan alongside patients and other health service providers. Complex high-needs individuals in particular may benefit by having regular and timely access to a familiar primary care provider.

Finally, we found no strong associations between the longitudinal change in these indicators with aggregated Health Link groupings by level of deprivation and by rurality. While this parallels our baseline evaluation of the top 5% high-cost users reported in the *Assessing Value in Ontario Health Links Part 3*

report, it is contrary to the patterns observed for the full Ontario population (Kromm, Mondor et al. 2015). Future research to explain these differences is warranted.

In conclusion, this report describes the 2-year trends in the health system performance trends for the Health Links target population based on selected indicators that reflect some of the main aspects of health system performance and that are measureable with health administrative data, considering a complex high-needs patient population. As the Health Link programs evolve and care coordination is optimized according to local needs, it is expected that greater improvements will be observed with additional prospective follow-up time.

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Appendix 1: Selected Conditions for Target Populations and Disease Prevalence

Table A1.1: Socio-Demographics and Clinical Characteristics (disease prevalence of 55 conditions) of the 2012 and 2014 Target Populations included in this Report

	2012 Target Population	2014 Target Population
	N=514,848	N=546,450
Socio-Demographics		
Mean Age ± SD	67.36 ± 18.18	67.43 ± 18.29
Women	280,505 (54.5%)	296,630 (54.3%)
Men	234,343 (45.5%)	249,820 (45.7%)
Conditions		
No. Conditions (Median, IQR)	5.00 (4.00-6.00)	5.00 (4.00-6.00)
ALS	364 (0.1%)	352 (0.1%)
Amputation	14,100 (2.7%)	14,990 (2.7%)
Anemia	105,456 (20.5%)	109,888 (20.1%)
Anxiety	190,103 (36.9%)	196,469 (36.0%)
Arthritis	241,984 (47.0%)	256,029 (46.9%)
Asthma	60,682 (11.8%)	63,956 (11.7%)
Bipolar Disorder	31,261 (6.1%)	33,223 (6.1%)
Brain Injury	29,823 (5.8%)	34,011 (6.2%)
COPD	89,166 (17.3%)	93,741 (17.2%)
Cardiac Arrhythmia	109,252 (21.2%)	116,183 (21.3%)
Cerebral Palsy	2,034 (0.4%)	2,107 (0.4%)
Coagulation Defects	18,650 (3.6%)	19,547 (3.6%)
Coma	1,378 (0.3%)	1,061 (0.2%)
Congenital Malformations	22,552 (4.4%)	25,046 (4.6%)
Congestive Heart Failure	75,028 (14.6%)	81,335 (14.9%)
Crohn's Disease/ Colitis	14,505 (2.8%)	15,058 (2.8%)
Cystic Fibrosis	229 (0.0%)	214 (0.0%)
Dementia	75,115 (14.6%)	81,564 (14.9%)
Depression	96,021 (18.7%)	103,653 (19.0%)
Developmental Disorders	9,193 (1.8%)	10,619 (1.9%)
Diabetes	197,100 (38.3%)	212,861 (39.0%)
Eating Disorders	1,028 (0.2%)	1,185 (0.2%)
Epilepsy & Seizures	15,126 (2.9%)	15,831 (2.9%)
Fracture	64,527 (12.5%)	72,579 (13.3%)
HIV/AIDS	1,917 (0.4%)	2,116 (0.4%)
Hemiplegia/ Hemiparesis	9,583 (1.9%)	9,980 (1.8%)
Hernia	32,629 (6.3%)	35,456 (6.5%)
Hip Replacement	10,759 (2.1%)	12,153 (2.2%)

	2012 Target Population	2014 Target Population
	N=514,848	N=546,450
Conditions		
Huntington's Chorea	216 (0.0%)	251 (0.0%)
Hypertension	319,220 (62.0%)	336,550 (61.6%)
Influenza	14,291 (2.8%)	18,170 (3.3%)
Ischemic Heart Disease	149,590 (29.1%)	148,011 (27.1%)
Knee Replacement	13,585 (2.6%)	15,324 (2.8%)
Liver Disease	18,401 (3.6%)	22,339 (4.1%)
Low Birth Weight Baby	2,250 (0.4%)	2,401 (0.4%)
Malignant Neoplasm	124,856 (24.3%)	136,528 (25.0%)
Meningitis	1,455 (0.3%)	1,521 (0.3%)
Multiple Sclerosis	3,778 (0.7%)	4,163 (0.8%)
Muscular Dystrophy	982 (0.2%)	981 (0.2%)
Osteoporosis	55,573 (10.8%)	60,625 (11.1%)
Other Perinatal Conditions	4,253 (0.8%)	4,451 (0.8%)
Pain Management	3,703 (0.7%)	3,292 (0.6%)
Palliative Care	13,367 (2.6%)	15,945 (2.9%)
Paralysis	8,236 (1.6%)	9,106 (1.7%)
Parkinson's Disease	13,615 (2.6%)	14,543 (2.7%)
Peripheral Vascular Disease	52,070 (10.1%)	55,273 (10.1%)
Personality Disorders	13,541 (2.6%)	13,832 (2.5%)
Pneumonia	71,108 (13.8%)	75,871 (13.9%)
Renal Failure	73,491 (14.3%)	84,242 (15.4%)
Schizophrenia & Delusions	21,216 (4.1%)	21,563 (3.9%)
Sepsis	16,165 (3.1%)	19,310 (3.5%)
Stroke	59,739 (11.6%)	60,713 (11.1%)
Substance-Related Disorders	44,305 (8.6%)	46,830 (8.6%)
Transplant	1,169 (0.2%)	1,632 (0.3%)
Ulcer	16,233 (3.2%)	17,141 (3.1%)

Appendix 2: Population Pyramids for 2012 and 2014 Target Populations

Figure A2.1: Age-Sex Distribution of 2012 Target Population

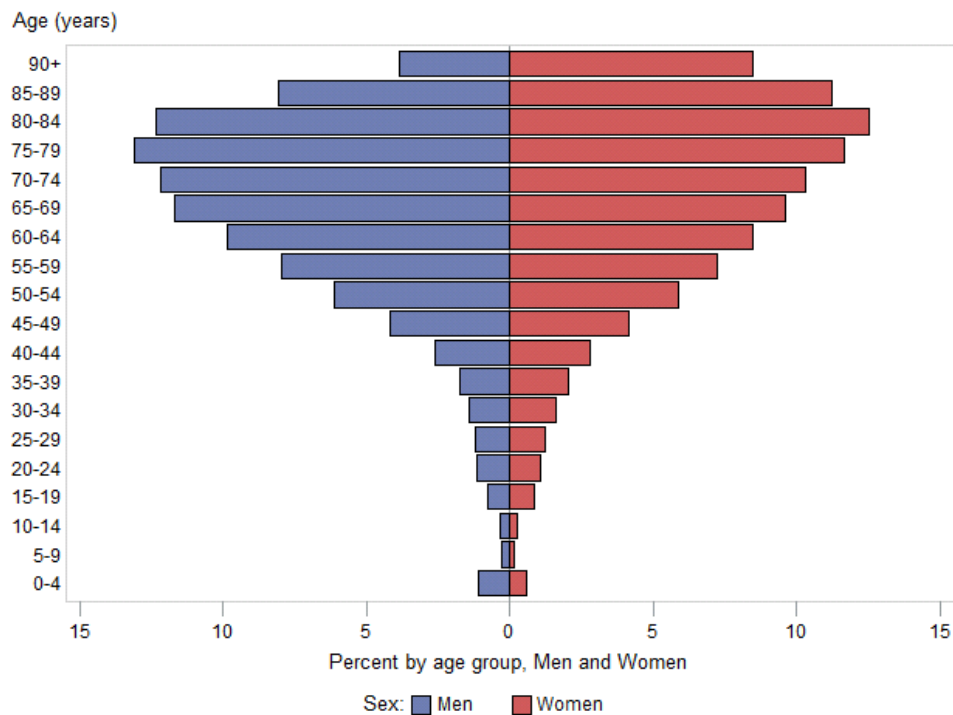
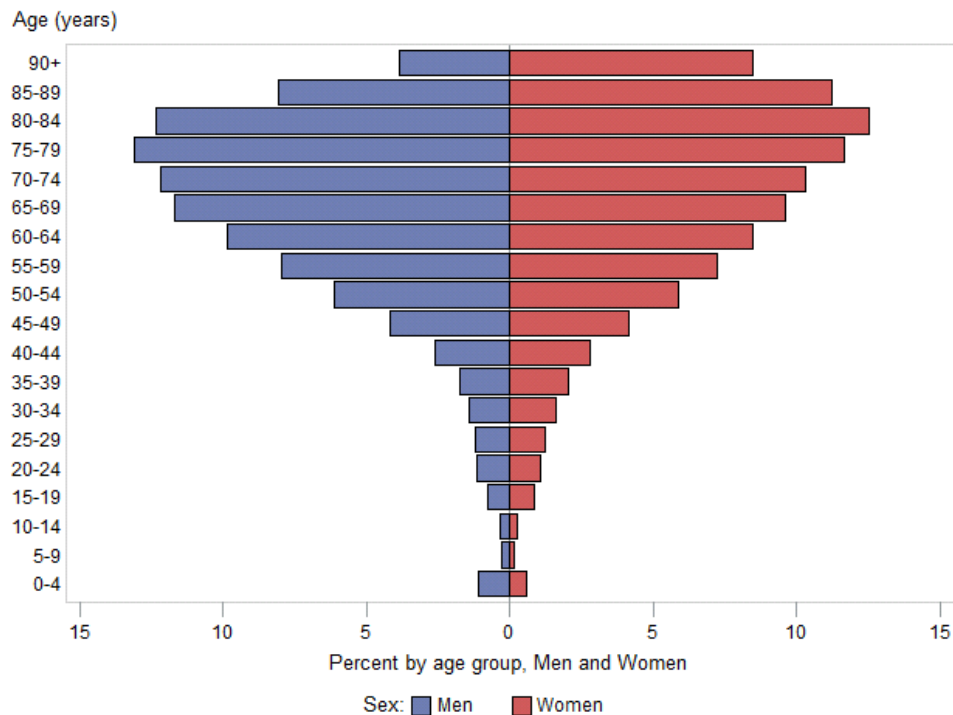


Figure A2.2: Age-Sex Distribution of 2014 Target Population



Appendix 3: Full indicator estimates for 2012 and 2014, by Health Link

This section presents the full details of each indicator in 2012 and in 2014 at the Health Link level, including:

- The total number of events or total monthly expenditures¹ (numerator),
- Population size or number of CMG hospital discharges (denominator) ,
- Crude (unadjusted) indicator estimates,
- Standardized or risk-adjusted indicator estimate, and
- Test comparing the Health Link-adjusted value to that of the overall (Target Population) value. Here, “H” indicates that the value is statistically greater than the overall estimate, and “L” indicates that the value is statistically less than the overall estimate.

¹ Sum of all individuals’ mean monthly cost

Table A3.1: Full results at Health Link-level, Health Care Expenditures (\$ per month alive)

Health Link	2012					2014				
	Total Cost (1000s)	Pop Size	Crude Estimate	Risk-Adj Estimate	Test	Total Cost (1000s)	Pop Size	Crude Estimate	Risk-Adj Estimate	Test
Overall	1,085,267	514,848	2,108	.		1,138,446	546,450	2,083	.	
-Not Assigned to HL-	125,683	60,468	2,079	2,103		131,066	63,537	2,063	2,088	
LHIN 1: Erie St. Clair										
Chatham Kent HL	5,406	2,099	2,576	2,541	H	6,039	2,610	2,314	2,303	H
Essex County South Shore HL	5,928	2,571	2,306	2,243	H	7,321	2,798	2,616	2,526	H
Lambton County Lake Huron HL	13,266	6,221	2,132	2,120		13,522	6,184	2,187	2,158	H
LHIN2: South West										
Huron Perth HL*	11,030	4,701	2,346	2,276	H	11,810	4,943	2,389	2,321	H
London Middlesex HL	38,325	17,062	2,246	2,254	H	41,783	18,990	2,200	2,208	H
North Grey Bruce HL	7,503	3,399	2,208	2,158		7,312	3,307	2,211	2,151	
South Grey Bruce HL	4,324	1,775	2,436	2,374	H	4,335	1,823	2,378	2,308	H
LHIN 3: Waterloo Wellington										
Cambridge and North Dumfries HL	10,571	4,862	2,174	2,198		10,343	5,014	2,063	2,085	
Guelph HL*	9,837	4,159	2,365	2,359	H	10,484	4,365	2,402	2,392	H
Kitchener Waterloo HL	22,241	9,826	2,263	2,263	H	24,116	10,587	2,278	2,278	H
Rural Wellington HL	6,006	2,711	2,215	2,171		6,308	2,803	2,250	2,209	H
LHIN 4: HNB										
Brant Six Nations HL	11,139	5,104	2,182	2,184		11,908	5,137	2,318	2,302	H
Burlington HL	15,151	7,652	1,980	1,966	L	16,336	8,436	1,936	1,929	L
Haldimand HL	3,999	1,901	2,104	2,114		4,144	1,962	2,112	2,109	
Hamilton Central HL*	22,515	8,767	2,568	2,607	H	23,451	9,477	2,475	2,517	H
Hamilton East HL	17,211	6,819	2,524	2,492	H	19,664	8,735	2,251	2,236	H
Hamilton West HL	15,671	6,540	2,396	2,395	H	15,284	6,620	2,309	2,309	H
Niagara North East HL	20,877	10,323	2,022	2,023	L	22,228	11,149	1,994	1,992	L
Niagara North West HL	4,125	2,270	1,817	1,816	L	4,318	2,271	1,902	1,896	L
Niagara South East HL	11,773	5,549	2,122	2,110		12,885	6,118	2,106	2,095	
Niagara South West HL	8,298	3,914	2,120	2,073		8,660	4,123	2,100	2,051	
Norfolk HL	5,872	2,677	2,193	2,160		5,990	2,786	2,150	2,124	
LHIN 5: Central West										
Bolton Caledon HL	2,658	1,578	1,685	1,726	L	2,787	1,718	1,622	1,660	L
Bramalea and Area HL	9,867	6,343	1,556	1,642	L	11,904	7,271	1,637	1,734	L
Brampton and Area HL	14,418	8,352	1,726	1,814	L	15,750	9,572	1,645	1,730	L
Dufferin and Area HL*	3,392	1,821	1,863	1,886	L	3,797	1,859	2,042	2,070	
N Etobicoke, Malton, W Woodbridge HL*	13,073	7,291	1,793	1,845	L	14,256	8,400	1,697	1,754	L
LHIN 6: Mississauga Halton										
East Mississauga HL*	24,051	12,636	1,903	1,942	L	24,959	13,930	1,792	1,832	L
Halton Hills HL	4,096	1,957	2,093	2,146		3,830	1,915	2,000	2,024	
Milton HL	3,102	2,005	1,547	1,628	L	3,596	2,302	1,562	1,645	L
North West Mississauga HL	10,189	5,539	1,840	1,913	L	10,720	5,778	1,855	1,921	L
Oakville HL	13,396	7,354	1,822	1,834	L	14,227	7,842	1,814	1,820	L
South Etobicoke HL	9,500	4,456	2,132	2,096		10,267	5,052	2,032	2,003	
South West Mississauga HL	8,647	4,456	1,940	1,964	L	9,375	5,171	1,813	1,849	L
LHIN 7: Toronto Central										
Central West Toronto HL	6,098	3,287	1,855	1,870	L	5,946	3,333	1,784	1,794	L
Don Valley/Greenwood HL*	13,095	6,010	2,179	2,270	H	13,415	5,774	2,323	2,370	H
East Toronto HL*	15,684	7,634	2,055	2,078		15,754	7,683	2,051	2,078	
Mid East Toronto HL*	9,603	4,835	1,986	2,121		10,866	5,065	2,145	2,286	H
Mid West Toronto HL*	33,454	16,326	2,049	2,088		35,831	17,587	2,037	2,079	
North East Toronto HL	14,962	6,399	2,338	2,309	H	15,262	6,444	2,368	2,322	H
North West Toronto HL	14,623	5,551	2,634	2,556	H	13,762	5,578	2,467	2,387	H
South Toronto HL	16,209	7,383	2,195	2,198	H	15,017	6,918	2,171	2,164	
West Toronto HL	8,880	3,088	2,876	2,815	H	7,558	2,721	2,778	2,745	H

Notes: * indicates early adopter Health Links

Health Link	2012					2014				
	Total Cost (1000s)	Pop Size	Crude Estimate	Risk-Adj Estimate	Test	Total Cost (1000s)	Pop Size	Crude Estimate	Risk-Adj Estimate	Test
LHIN 8: Central										
North York Central HL*	36,251	17,897	2,026	1,993	L	38,335	18,564	2,065	2,029	L
North York West HL	25,171	13,328	1,889	1,907	L	26,256	13,884	1,891	1,901	L
S Simcoe and N York Region HL*	20,208	9,989	2,023	2,049		23,043	11,357	2,029	2,053	
Southeast York Region HL	14,478	8,128	1,781	1,811	L	16,112	9,006	1,789	1,813	L
Southwest York Region HL	27,487	15,572	1,765	1,775	L	31,918	18,198	1,754	1,767	L
LHIN 9: Central East										
Durham North East HL	23,820	12,041	1,978	2,001	L	23,584	11,878	1,986	2,006	L
Haliburton and Kawartha Lakes HL	7,816	3,622	2,158	2,089		8,153	3,584	2,275	2,194	H
Northumberland HL	6,394	2,764	2,313	2,227	H	6,488	2,818	2,302	2,238	H
Peterborough HL*	14,473	6,652	2,176	2,142		14,224	6,790	2,095	2,059	
Scarborough North HL	14,009	7,895	1,774	1,758	L	15,537	8,277	1,877	1,853	L
Scarborough South HL	29,292	15,379	1,905	1,936	L	31,487	17,008	1,851	1,888	L
LHIN 10: South East										
Kingston HL*	15,133	6,529	2,318	2,368	H	15,612	6,820	2,289	2,327	H
Quinte HL*	12,130	5,357	2,264	2,261	H	11,781	5,249	2,244	2,217	H
Rideau Tay HL	4,160	1,814	2,293	2,219		4,202	1,824	2,304	2,230	H
Rural Hastings HL*	4,485	2,257	1,987	1,978		4,527	2,347	1,929	1,895	L
Rural Kingston HL*	1,578	697	2,264	2,257		1,882	805	2,338	2,342	H
Salmon River HL	2,188	895	2,444	2,382	H	2,279	975	2,338	2,313	H
Thousand Islands HL*	7,709	3,518	2,191	2,215	H	7,620	3,383	2,252	2,271	H
LHIN 11: Champlain										
Arnprior Region and Ottawa West HL	8,426	4,201	2,006	2,036		9,038	4,693	1,926	1,948	L
Central Ottawa HL	35,267	15,266	2,310	2,300	H	33,812	14,922	2,266	2,267	H
North Renfrew County HL	5,455	2,411	2,263	2,241	H	552	2,559	2,158	2,139	
Prescott-Russell Regional HL	5,118	2,367	2,162	2,153		5,029	2,272	2,213	2,194	
South Ottawa and North Grenville HL	10,333	4,698	2,199	2,208	H	13,101	5,677	2,308	2,314	H
South Renfrew HL	4,244	1,734	2,447	2,409	H	4,513	1,861	2,425	2,367	H
SGCA HL	9,415	3,620	2,601	2,539	H	9,340	3,705	2,521	2,471	H
Upper Canada HL	4,972	2,108	2,359	2,336	H	6,034	2,730	2,210	2,190	H
LHIN 12: North Simcoe Muskoka										
Barrie Community HL*	13,475	5,655	2,383	2,386	H	13,790	6,263	2,202	2,208	H
Couchiching Community HL	6,960	3,169	2,196	2,156		7,071	3,256	2,171	2,126	
Muskoka Community HL	5,737	2,643	2,171	2,118		5,789	2,724	2,125	2,090	
North Simcoe Community HL	5,601	2,675	2,094	2,111		5,597	2,635	2,124	2,125	
South Georgian Bay Community HL*	5,146	2,592	1,985	1,945	L	6,000	2,909	2,063	2,011	
LHIN 13: North East										
Nipissing East Parry Sound HL	9,814	4,312	2,276	2,268	H	10,163	4,335	2,344	2,327	H
North Cochrane HL	1,771	926	1,913	1,980		1,772	866	2,046	2,079	
Sault Ste. Marie HL	10,102	3,971	2,544	2,521	H	10,365	4,440	2,334	2,316	H
Temiskaming HL*	3,947	1,481	2,665	2,613	H	3,745	1,409	2,658	2,597	H
Timmins HL*	6,418	2,811	2,283	2,321	H	6,570	2,963	2,217	2,267	H
LHIN 14: North West										
City of Thunder Bay HL	17,014	6,643	2,561	2,542	H	16,543	6,348	2,606	2,584	H
District of Rainy River HL	1,697	741	2,290	2,243		1,587	687	2,309	2,261	
District of Thunder Bay HL	1,823	819	2,226	2,307		1,840	741	2,482	2,556	H

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Table A3.2: Full results at Health Link-level, Acute (all-cause) Hospitalizations (per 100,000 population)

Health Link	2012					2014				
	Events	Pop Size	Crude Estimate	Std Estimate	Test	Events	Pop Size	Crude Estimate	Std Estimate	Test
Overall	283,660	514,848	55,096	48,901		304,063	546,450	55,643	49,093	
-Not Assigned to HL-	34,710	60,468	57,402	50,692	H	36,906	63,537	58,086	49,102	
LHIN 1: Erie St. Clair										
Chatham Kent HL	1,306	2,099	62,220	57,875	H	1,681	2,610	64,406	49,407	
Essex County South Shore HL	1,484	2,571	57,721	52,148		1,642	2,798	58,685	55,452	
Lambton County Lake Huron HL	3,794	6,221	60,987	48,349		3,895	6,184	62,985	56,278	H
LHIN2: South West										
Huron Perth HL*	3,322	4,701	70,666	71,600	H	3,520	4,943	71,212	66,154	H
London Middlesex HL	9,881	17,062	57,912	56,877	H	10,879	18,990	57,288	52,584	H
North Grey Bruce HL	2,189	3,399	64,401	42,936		2,087	3,307	63,109	44,822	
South Grey Bruce HL	1,315	1,775	74,085	63,285	H	1,314	1,823	72,079	62,204	H
LHIN 3: Waterloo Wellington										
Cambridge and North Dumfries HL	2,673	4,862	54,977	57,871	H	2,786	5,014	55,564	55,277	H
Guelph HL*	2,665	4,159	64,078	56,534	H	2,987	4,365	68,431	55,005	H
Kitchener Waterloo HL	5,022	9,826	51,109	52,250		5,922	10,587	55,937	57,293	H
Rural Wellington HL	1,692	2,711	62,412	58,213	H	1,927	2,803	68,748	52,760	
LHIN 4: HNIIB										
Brant Six Nations HL	3,278	5,104	64,224	57,706	H	3,455	5,137	67,257	66,336	H
Burlington HL	3,603	7,652	47,086	39,788	L	4,091	8,436	48,495	41,613	L
Haldimand HL	1,118	1,901	58,811	48,289		1,135	1,962	57,849	58,207	H
Hamilton Central HL*	5,482	8,767	62,530	47,047		6,093	9,477	64,292	52,638	H
Hamilton East HL	4,185	6,819	61,373	54,290	H	5,208	8,735	59,622	46,714	
Hamilton West HL	3,736	6,540	57,125	52,689		3,823	6,620	57,749	51,875	
Niagara North East HL	5,492	10,323	53,202	51,444		5,661	11,149	50,776	47,005	
Niagara North West HL	1,181	2,270	52,026	45,490		1,207	2,271	53,148	47,754	
Niagara South East HL	3,014	5,549	54,316	44,767		2,984	6,118	48,774	47,138	
Niagara South West HL	2,054	3,914	52,478	46,995		2,022	4,123	49,042	48,991	
Norfolk HL	1,702	2,677	63,579	61,216	H	1,797	2,786	64,501	48,145	
LHIN 5: Central West										
Bolton Caledon HL	771	1,578	48,859	44,676		804	1,718	46,779	44,150	
Bramalea and Area HL	3,013	6,343	47,501	50,787		3,591	7,271	49,388	49,439	
Brampton and Area HL	4,043	8,352	48,408	45,037	L	4,748	9,572	49,603	45,999	L
Dufferin and Area HL*	1,066	1,821	58,539	42,962		1,170	1,859	62,937	50,589	
N Etobicoke, Malton, W Woodbridge HL*	3,798	7,291	52,092	46,668		4,176	8,400	49,714	52,671	
LHIN 6: Mississauga Halton										
East Mississauga HL*	6,137	12,636	48,568	44,244	L	6,460	13,930	46,375	41,956	L
Halton Hills HL	1,186	1,957	60,603	50,398		1,090	1,915	56,919	45,912	
Milton HL	983	2,005	49,027	39,749	L	1,206	2,302	52,389	47,012	
North West Mississauga HL	2,625	5,539	47,391	46,895		2,821	5,778	48,823	48,407	
Oakville HL	3,823	7,354	51,985	42,858	L	4,124	7,842	52,589	43,094	L
South Etobicoke HL	2,454	4,456	55,072	46,720		2,710	5,052	53,642	45,460	
South West Mississauga HL	2,101	4,456	47,150	43,933		2,336	5,171	45,175	44,251	L
LHIN 7: Toronto Central										
Central West Toronto HL	1,734	3,287	52,753	47,322		1,762	3,333	52,865	43,504	
Don Valley/Greenwood HL*	3,016	6,010	50,183	39,961	L	3,171	5,774	54,919	45,877	
East Toronto HL*	3,757	7,634	49,214	41,499	L	3,813	7,683	49,629	42,137	L
Mid East Toronto HL*	2,682	4,835	55,471	50,061		3,006	5,065	59,348	53,725	H
Mid West Toronto HL*	8,024	16,326	49,149	38,143	L	9,044	17,587	51,424	43,519	L
North East Toronto HL	3,378	6,399	52,789	43,550	L	3,601	6,444	55,881	44,929	
North West Toronto HL	2,859	5,551	51,504	49,926		2,988	5,578	53,568	38,746	L
South Toronto HL	4,142	7,383	56,102	52,033		3,758	6,918	54,322	47,860	
West Toronto HL	1,690	3,088	54,728	51,310		1,561	2,721	57,369	54,300	

Notes: *indicates early adopter Health Links

Health Link	2012					2014				
	Events	Pop Size	Crude Estimate	Std Estimate	Test	Events	Pop Size	Crude Estimate	Std Estimate	Test
LHIN 8: Central										
North York Central HL*	9,203	17,897	51,442	43,163	L	9,576	18,564	51,584	46,430	
North York West HL	6,325	13,328	47,456	50,000		6,816	13,884	49,092	46,200	
S Simcoe and N York Region HL*	5,184	9,989	51,897	47,316		5,906	11,357	52,003	47,895	
Southeast York Region HL	3,874	8,128	47,662	48,098		4,281	9,006	47,535	47,081	
Southwest York Region HL	7,254	15,572	46,584	43,192	L	8,411	18,198	46,219	42,366	L
LHIN 9: Central East										
Durham North East HL	6,102	12,041	50,677	39,320	L	6,251	11,878	52,627	45,641	L
Haliburton and Kawartha Lakes HL	1,999	3,622	55,191	41,395	L	1,966	3,584	54,855	45,740	
Northumberland HL	1,605	2,764	58,068	59,545	H	1,745	2,818	61,923	62,161	H
Peterborough HL*	3,457	6,652	51,969	43,757	L	3,849	6,790	56,686	45,594	
Scarborough North HL	3,510	7,895	44,459	45,581		3,747	8,277	45,270	42,205	L
Scarborough South HL	7,264	15,379	47,233	47,896		8,116	17,008	47,719	49,635	
LHIN 10: South East										
Kingston HL*	3,647	6,529	55,858	45,002	L	3,805	6,820	55,792	48,080	
Quinte HL*	3,299	5,357	61,583	55,574	H	3,015	5,249	57,440	52,214	
Rideau Tay HL	1,091	1,814	60,143	48,730		1,133	1,824	62,116	44,358	
Rural Hastings HL*	1,093	2,257	48,427	41,757		1,201	2,347	51,172	46,065	
Rural Kingston HL*	451	697	64,706	40,855		482	805	59,876	39,028	
Salmon River HL	513	895	57,318	44,672		596	975	61,128	44,235	
Thousand Islands HL*	2,349	3,518	66,771	51,139		2,255	3,383	66,657	47,809	
LHIN 11: Champlain										
Arnprior Region and Ottawa West HL	2,254	4,201	53,654	44,991		2,394	4,693	51,012	45,685	
Central Ottawa HL	7,906	15,266	51,788	50,217		7,912	14,922	53,022	48,500	
North Renfrew County HL	1,738	2,411	72,086	58,359	H	1,768	2,559	69,089	58,857	H
Prescott-Russell Regional HL	1,245	2,367	52,598	40,798	L	1,402	2,272	61,708	48,848	
South Ottawa and North Grenville HL	2,241	4,698	47,701	42,272	L	3,140	5,677	55,311	48,185	
South Renfrew HL	1,031	1,734	59,458	42,653		1,084	1,861	58,248	41,493	
SGCA HL	2,564	3,620	70,829	55,441		2,758	3,705	74,440	54,677	
Upper Canada HL	1,382	2,108	65,560	58,789	H	1,704	2,730	62,418	50,874	
LHIN 12: North Simcoe Muskoka										
Barrie Community HL*	3,268	5,655	57,790	51,659		3,772	6,263	60,227	52,269	
Couchiching Community HL	1,901	3,169	59,987	50,101		1,951	3,256	59,920	50,519	
Muskoka Community HL	1,569	2,643	59,364	46,976		1,770	2,724	64,978	52,918	
North Simcoe Community HL	1,698	2,675	63,477	50,184		1,782	2,635	67,628	53,151	
South Georgian Bay Community HL*	1,691	2,592	65,239	54,692		1,999	2,909	68,718	55,400	
LHIN 13: North East										
Nipissing East Parry Sound HL	3,157	4,312	73,214	67,669	H	3,292	4,335	75,940	65,752	H
North Cochrane HL	639	926	69,006	49,148		717	866	82,794	67,243	H
Sault Ste. Marie HL	3,187	3,971	80,257	71,239	H	3,285	4,440	73,986	71,324	H
Temiskaming HL*	1,291	1,481	87,171	83,976	H	1,289	1,409	91,483	82,018	H
Timmins HL*	2,133	2,811	75,880	73,030	H	2,124	2,963	71,684	53,804	
LHIN 14: North West										
City of Thunder Bay HL	4,977	6,643	74,921	65,175	H	4,625	6,348	72,858	62,772	H
District of Rainy River HL	713	741	96,221	86,611	H	587	687	85,444	96,693	H
District of Thunder Bay HL	675	819	82,418	68,247	H	595	741	80,297	80,775	H

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Table A3.3: Full results at Health Link-level, ED visits – Low Acuity (per 100,000 population):

Health Link	2012					2014				
	Events	Pop Size	Crude Estimate	Std Estimate	Test	Events	Pop Size	Crude Estimate	Std Estimate	Test
Overall	195,737	514,848	38,018	66,521		182,690	546,450	33,432	59,828	
-Not Assigned to HL-	28,537	60,468	47,194	77,950	H	27,466	63,537	43,228	76,411	H
LHIN 1: Erie St. Clair										
Chatham Kent HL	754	2,099	35,922	80,797	H	999	2,610	38,276	95,975	H
Essex County South Shore HL	998	2,571	38,818	82,173	H	839	2,798	29,986	55,410	
Lambton County Lake Huron HL	4,289	6,221	68,944	132,781	H	3,983	6,184	64,408	124,112	H
LHIN2: South West										
Huron Perth HL*	3,859	4,701	82,089	163,490	H	3,810	4,943	77,079	141,797	H
London Middlesex HL	6,843	17,062	40,107	80,346	H	5,895	18,990	31,043	66,388	H
North Grey Bruce HL	2,619	3,399	77,052	125,050	H	2,315	3,307	70,003	118,411	H
South Grey Bruce HL	2,911	1,775	164,000	246,942	H	2,885	1,823	158,256	230,740	H
LHIN 3: Waterloo Wellington										
Cambridge and North Dumfries HL	1,214	4,862	24,969	52,848	L	1,432	5,014	28,560	58,790	
Guelph HL*	1,235	4,159	29,695	71,573		1,047	4,365	23,986	49,573	L
Kitchener Waterloo HL	2,460	9,826	25,036	39,503	L	2,161	10,587	20,412	45,313	L
Rural Wellington HL	2,748	2,711	101,365	144,055	H	2,802	2,803	99,964	145,708	H
LHIN 4: HNB										
Brant Six Nations HL	1,233	5,104	24,158	45,544	L	1,623	5,137	31,594	57,586	
Burlington HL	2,007	7,652	26,228	44,542	L	1,535	8,436	18,196	33,563	L
Haldimand HL	1,480	1,901	77,854	108,912	H	1,444	1,962	73,598	83,007	H
Hamilton Central HL*	2,520	8,767	28,744	57,123	L	3,090	9,477	32,605	71,822	H
Hamilton East HL	1,739	6,819	25,502	45,995	L	2,020	8,735	23,125	48,560	L
Hamilton West HL	1,701	6,540	26,009	60,038	L	1,647	6,620	24,879	50,840	L
Niagara North East HL	3,366	10,323	32,607	65,579		1,885	11,149	16,907	36,071	L
Niagara North West HL	933	2,270	41,101	67,068		713	2,271	31,396	54,116	
Niagara South East HL	1,940	5,549	34,961	69,877		1,792	6,118	29,291	55,779	
Niagara South West HL	1,287	3,914	32,882	67,879		1,261	4,123	30,585	62,584	
Norfolk HL	1,235	2,677	46,134	95,615	H	1,222	2,786	43,862	71,199	H
LHIN 5: Central West										
Bolton Caledon HL	353	1,578	22,370	31,592	L	387	1,718	22,526	39,467	L
Bramalea and Area HL	1,052	6,343	16,585	27,481	L	803	7,271	11,044	18,142	L
Brampton and Area HL	1,538	8,352	18,415	31,588	L	1,328	9,572	13,874	24,175	L
Dufferin and Area HL*	828	1,821	45,470	72,579		817	1,859	43,948	75,824	H
N Etobicoke, Malton, W Woodbridge HL*	1,158	7,291	15,883	24,463	L	1,079	8,400	12,845	24,064	L
LHIN 6: Mississauga Halton										
East Mississauga HL*	2,761	12,636	21,850	36,608	L	3,042	13,930	21,838	36,952	L
Halton Hills HL	642	1,957	32,805	63,278		484	1,915	25,274	44,039	L
Milton HL	493	2,005	24,589	35,347	L	421	2,302	18,288	35,153	L
North West Mississauga HL	1,034	5,539	18,668	32,413	L	821	5,778	14,209	26,297	L
Oakville HL	1,767	7,354	24,028	40,117	L	1,191	7,842	15,187	27,339	L
South Etobicoke HL	1,275	4,456	28,613	46,167	L	1,512	5,052	29,929	54,523	
South West Mississauga HL	879	4,456	19,726	32,272	L	796	5,171	15,394	26,170	L
LHIN 7: Toronto Central										
Central West Toronto HL	716	3,287	21,783	43,015	L	705	3,333	21,152	48,457	L
Don Valley/Greenwood HL*	1,851	6,010	30,799	60,945	L	1,304	5,774	22,584	51,409	L
East Toronto HL*	1,549	7,634	20,291	45,504	L	1,462	7,683	19,029	36,117	L
Mid East Toronto HL*	1,991	4,835	41,179	73,959	H	1,496	5,065	29,536	47,192	L
Mid West Toronto HL*	4,449	16,326	27,251	53,972	L	4,218	17,587	23,984	49,412	L
North East Toronto HL	1,393	6,399	21,769	39,435	L	1,198	6,444	18,591	47,501	L
North West Toronto HL	1,191	5,551	21,456	55,156	L	1,197	5,578	21,459	57,573	
South Toronto HL	1,990	7,383	26,954	62,170		1,743	6,918	25,195	50,469	L
West Toronto HL	570	3,088	18,459	36,513	L	480	2,721	17,641	32,667	L

Notes: * indicates early adopter Health Links

Health Link	2012					2014				
	Events	Pop Size	Crude Estimate	Std Estimate	Test	Events	Pop Size	Crude Estimate	Std Estimate	Test
LHIN 8: Central										
North York Central HL*	3,565	17,897	19,920	36,835	L	3,229	18,564	17,394	32,281	L
North York West HL	2,611	13,328	19,590	36,810	L	2,362	13,884	17,012	32,891	L
S Simcoe and N York Region HL*	3,430	9,989	34,338	65,191		3,969	11,357	34,948	67,336	H
Southeast York Region HL	1,848	8,128	22,736	37,849	L	1,750	9,006	19,431	33,793	L
Southwest York Region HL	3,434	15,572	22,052	47,717	L	3,493	18,198	19,194	39,139	L
LHIN 9: Central East										
Durham North East HL	5,674	12,041	47,122	78,352	H	5,723	11,878	48,182	82,559	H
Haliburton and Kawartha Lakes HL	2,629	3,622	72,584	137,906	H	2,550	3,584	71,150	114,430	H
Northumberland HL	1,184	2,764	42,836	72,825		1,254	2,818	44,500	84,984	H
Peterborough HL*	2,503	6,652	37,628	78,983	H	2,642	6,790	38,910	82,139	H
Scarborough North HL	1,301	7,895	16,479	31,536	L	1,088	8,277	13,145	26,916	L
Scarborough South HL	3,379	15,379	21,972	39,703	L	3,273	17,008	19,244	36,159	L
LHIN 10: South East										
Kingston HL*	4,017	6,529	61,526	107,763	H	4,085	6,820	59,897	118,169	H
Quinte HL*	2,577	5,357	48,105	80,993	H	2,715	5,249	51,724	94,209	H
Rideau Tay HL	1,883	1,814	103,804	201,588	H	1,358	1,824	74,452	136,101	H
Rural Hastings HL*	1,443	2,257	63,934	90,548	H	1,320	2,347	56,242	95,766	H
Rural Kingston HL*	453	697	64,993	99,561	H	383	805	47,578	78,890	H
Salmon River HL	665	895	74,302	154,646	H	675	975	69,231	120,078	H
Thousand Islands HL*	1,605	3,518	45,623	105,197	H	1,085	3,383	32,072	68,304	H
LHIN 11: Champlain										
Arnprior Region and Ottawa West HL	1,594	4,201	37,943	57,455	L	1,280	4,693	27,275	41,995	L
Central Ottawa HL	3,395	15,266	22,239	37,684	L	2,637	14,922	17,672	34,225	L
North Renfrew County HL	2,069	2,411	85,815	159,156	H	1,743	2,559	68,113	123,342	H
Prescott-Russell Regional HL	1,724	2,367	72,835	116,014	H	1,295	2,272	56,998	78,322	H
South Ottawa and North Grenville HL	1,504	4,698	32,014	43,771	L	1,414	5,677	24,908	44,093	L
South Renfrew HL	2,045	1,734	117,935	169,098	H	1,778	1,861	95,540	144,480	H
SGCA HL	2,211	3,620	61,077	124,576	H	1,830	3,705	49,393	68,528	H
Upper Canada HL	671	2,108	31,831	51,794	L	900	2,730	32,967	60,312	
LHIN 12: North Simcoe Muskoka										
Barrie Community HL*	1,949	5,655	34,465	60,548	L	2,051	6,263	32,748	68,318	H
Couchiching Community HL	2,189	3,169	69,075	156,173	H	1,782	3,256	54,730	118,810	H
Muskoka Community HL	1,522	2,643	57,586	116,991	H	1,541	2,724	56,571	99,349	H
North Simcoe Community HL	1,599	2,675	59,776	115,927	H	1,525	2,635	57,875	115,086	H
South Georgian Bay Community HL*	1,137	2,592	43,866	64,437		1,363	2,909	46,855	97,566	H
LHIN 13: North East										
Nipissing East Parry Sound HL	3,869	4,312	89,726	156,476	H	3,072	4,335	70,865	115,455	H
North Cochrane HL	3,147	926	339,849	504,411	H	2,626	866	303,233	395,911	H
Sault Ste. Marie HL	946	3,971	23,823	55,599	L	1,077	4,440	24,257	63,706	
Temiskaming HL*	2,329	1,481	157,259	235,264	H	1,897	1,409	134,634	189,338	H
Timmins HL*	3,622	2,811	128,851	226,487	H	3,913	2,963	132,062	200,140	H
LHIN 14: North West										
City of Thunder Bay HL	2,838	6,643	42,722	90,699	H	2,024	6,348	31,884	76,736	H
District of Rainy River HL	1,056	741	142,510	216,291	H	1,307	687	190,247	246,137	H
District of Thunder Bay HL	2,732	819	333,578	334,640	H	2,331	741	314,575	413,060	H

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Table A3.4: Full results at Health Link-level, ED visits – All CTAS Levels (per 100,000 population):

Health Link	2012					2014				
	Events	Pop Size	Crude Estimate	Std Estimate	Test	Events	Pop Size	Crude Estimate	Std Estimate	Test
Overall	631,811	514,848	122,718	207,829		688,587	546,450	126,011	215,270	
-Not Assigned to HL-	82,535	60,468	136,494	224,495	H	88,594	63,537	139,437	232,575	H
LHIN 1: Erie St. Clair										
Chatham Kent HL	2,776	2,099	132,253	242,057	H	3,497	2,610	133,985	257,520	H
Essex County South Shore HL	3,460	2,571	134,578	252,949	H	3,647	2,798	130,343	244,670	H
Lambton County Lake Huron HL	8,909	6,221	143,208	281,057	H	9,471	6,184	153,153	295,164	H
LHIN2: South West										
Huron Perth HL*	7,361	4,701	156,584	317,694	H	7,895	4,943	159,721	297,498	H
London Middlesex HL	20,869	17,062	122,313	223,700	H	23,279	18,990	122,586	217,989	
North Grey Bruce HL	7,006	3,399	206,119	332,893	H	6,584	3,307	199,093	318,434	H
South Grey Bruce HL	4,296	1,775	242,028	392,840	H	4,490	1,823	246,297	396,305	H
LHIN 3: Waterloo Wellington										
Cambridge and North Dumfries HL	5,204	4,862	107,034	203,981		5,966	5,014	118,987	227,603	H
Guelph HL*	4,840	4,159	116,374	238,308	H	5,220	4,365	119,588	220,967	
Kitchener Waterloo HL	10,249	9,826	104,305	162,259	L	11,999	10,587	113,337	205,626	L
Rural Wellington HL	5,036	2,711	185,762	293,000	H	5,328	2,803	190,082	321,385	H
LHIN 4: HNIB										
Brant Six Nations HL	5,455	5,104	106,877	198,642		6,468	5,137	125,910	240,274	H
Burlington HL	6,375	7,652	83,312	142,956	L	6,953	8,436	82,421	148,963	L
Haldimand HL	3,507	1,901	184,482	277,251	H	3,648	1,962	185,933	257,602	H
Hamilton Central HL*	11,022	8,767	125,721	231,231	H	13,488	9,477	142,324	276,821	H
Hamilton East HL	7,174	6,819	105,206	185,966	L	9,495	8,735	108,701	188,432	L
Hamilton West HL	7,165	6,540	109,557	222,582	H	7,206	6,620	108,852	200,423	L
Niagara North East HL	12,071	10,323	116,933	224,094	H	11,974	11,149	107,400	193,040	L
Niagara North West HL	2,467	2,270	108,678	185,139	L	2,382	2,271	104,888	169,222	L
Niagara South East HL	7,869	5,549	141,809	247,928	H	9,495	6,118	155,198	289,270	H
Niagara South West HL	4,577	3,914	116,939	217,306		5,237	4,123	127,019	240,473	H
Norfolk HL	3,203	2,677	119,649	253,293	H	3,499	2,786	125,592	224,730	
LHIN 5: Central West										
Bolton Caledon HL	1,435	1,578	90,938	144,652	L	1,682	1,718	97,905	176,565	L
Bramalea and Area HL	5,669	6,343	89,374	138,478	L	6,637	7,271	91,280	142,794	L
Brampton and Area HL	7,214	8,352	86,375	134,901	L	8,848	9,572	92,436	160,250	L
Dufferin and Area HL*	2,515	1,821	138,111	210,950		2,671	1,859	143,679	228,242	
N Etobicoke, Malton, W Woodbridge HL*	6,641	7,291	91,085	134,211	L	7,754	8,400	92,310	147,900	L
LHIN 6: Mississauga Halton										
East Mississauga HL*	11,517	12,636	91,144	146,024	L	13,606	13,930	97,674	160,091	L
Halton Hills HL	2,294	1,957	117,220	208,062		2,203	1,915	115,039	192,458	L
Milton HL	1,954	2,005	97,456	132,659	L	2,181	2,302	94,744	154,055	L
North West Mississauga HL	5,143	5,539	92,851	143,709	L	5,082	5,778	87,954	139,579	L
Oakville HL	6,689	7,354	90,957	155,253	L	6,883	7,842	87,771	149,326	L
South Etobicoke HL	4,661	4,456	104,601	176,376	L	5,731	5,052	113,440	206,415	
South West Mississauga HL	3,832	4,456	85,996	139,630	L	4,436	5,171	85,786	133,852	L
LHIN 7: Toronto Central										
Central West Toronto HL	3,610	3,287	109,827	188,182	L	3,990	3,333	119,712	200,788	L
Don Valley/Greenwood HL*	8,489	6,010	141,248	236,605	H	7,266	5,774	125,840	233,916	H
East Toronto HL*	7,998	7,634	104,768	184,850	L	8,557	7,683	111,376	171,956	L
Mid East Toronto HL*	7,861	4,835	162,585	251,037	H	8,263	5,065	163,139	230,962	H
Mid West Toronto HL*	18,760	16,326	114,909	199,332	L	21,372	17,587	121,522	211,298	
North East Toronto HL	6,675	6,399	104,313	176,715	L	6,764	6,444	104,966	205,166	
North West Toronto HL	5,805	5,551	104,576	224,916	H	6,273	5,578	112,460	242,674	H
South Toronto HL	8,721	7,383	118,123	238,269	H	8,181	6,918	118,257	214,593	
West Toronto HL	3,146	3,088	101,878	195,439		2,716	2,721	99,816	169,475	L

Notes: * indicates early adopter Health Links

Health Link	2012					2014				
	Events	Pop Size	Crude Estimate	Std Estimate	Test	Events	Pop Size	Crude Estimate	Std Estimate	Test
LHIN 8: Central										
North York Central HL*	16,608	17,897	92,978	147,343	L	17,555	18,564	94,565	157,953	L
North York West HL	13,899	13,328	104,284	164,158	L	14,788	13,884	106,511	180,838	L
S Simcoe and N York Region HL*	11,577	9,989	115,897	205,134		14,508	11,357	127,745	237,089	H
Southeast York Region HL	7,359	8,128	90,539	143,859	L	7,991	9,006	88,730	142,608	L
Southwest York Region HL	14,590	15,572	93,694	159,226	L	17,560	18,198	96,494	176,999	L
LHIN 9: Central East										
Durham North East HL	16,287	12,041	135,263	216,974	H	16,315	11,878	137,355	231,468	H
Haliburton and Kawartha Lakes HL	6,020	3,622	166,207	291,220	H	6,341	3,584	176,925	278,322	H
Northumberland HL	3,683	2,764	133,249	245,895	H	4,064	2,818	143,577	249,081	H
Peterborough HL*	8,443	6,652	126,924	252,511	H	9,189	6,790	135,331	267,669	H
Scarborough North HL	6,113	7,895	77,429	132,085	L	6,721	8,277	81,201	140,926	L
Scarborough South HL	15,850	15,379	103,063	167,727	L	18,324	17,008	107,738	180,289	L
LHIN 10: South East										
Kingston HL*	10,146	6,529	155,399	256,617	H	10,922	6,820	160,147	291,450	H
Quinte HL*	8,511	5,357	158,876	249,816	H	8,470	5,249	161,364	279,709	H
Rideau Tay HL	3,135	1,814	172,822	340,935	H	3,170	1,824	173,794	302,242	H
Rural Hastings HL*	3,520	2,257	155,959	250,786	H	3,743	2,347	159,480	285,046	H
Rural Kingston HL*	1,081	697	155,093	226,088		1,109	805	137,764	201,384	
Salmon River HL	1,419	895	158,547	290,217	H	1,751	975	179,590	273,612	H
Thousand Islands HL*	4,520	3,518	128,482	248,349	H	4,085	3,383	120,751	249,087	H
LHIN 11: Champlain										
Arnprior Region and Ottawa West HL	5,116	4,201	121,781	199,560		6,264	4,693	133,475	185,264	L
Central Ottawa HL	16,934	15,266	110,926	165,357	L	17,680	14,922	118,483	180,944	L
North Renfrew County HL	3,801	2,411	157,652	306,191	H	4,522	2,559	176,710	304,156	H
Prescott-Russell Regional HL	3,618	2,367	152,852	269,227	H	3,473	2,272	152,861	237,039	H
South Ottawa and North Grenville HL	5,782	4,698	123,074	175,126	L	7,865	5,677	138,541	217,252	
South Renfrew HL	3,508	1,734	202,307	297,978	H	3,565	1,861	191,564	292,129	H
SGCA HL	6,411	3,620	177,099	357,479	H	6,785	3,705	183,131	276,945	H
Upper Canada HL	2,582	2,108	122,486	175,886	L	3,936	2,730	144,176	252,009	H
LHIN 12: North Simcoe Muskoka										
Barrie Community HL*	6,937	5,655	122,670	193,555	L	8,356	6,263	133,418	236,990	H
Couchiching Community HL	5,363	3,169	169,233	320,779	H	5,347	3,256	164,220	302,251	H
Muskoka Community HL	3,382	2,643	127,961	243,512	H	3,990	2,724	146,476	257,006	H
North Simcoe Community HL	4,567	2,675	170,729	290,264	H	5,065	2,635	192,220	323,364	H
South Georgian Bay Community HL*	3,244	2,592	125,154	190,040		4,061	2,909	139,601	256,638	H
LHIN 13: North East										
Nipissing East Parry Sound HL	7,175	4,312	166,396	291,883	H	7,527	4,335	173,633	296,307	H
North Cochrane HL	3,577	926	386,285	578,349	H	3,357	866	387,644	593,101	H
Sault Ste. Marie HL	5,073	3,971	127,751	239,893	H	6,708	4,440	151,081	310,385	H
Temiskaming HL*	3,235	1,481	218,433	399,847	H	2,820	1,409	200,142	320,822	H
Timmins HL*	6,413	2,811	228,139	405,685	H	6,686	2,963	225,650	348,752	H
LHIN 14: North West										
City of Thunder Bay HL	12,628	6,643	190,095	367,800	H	11,435	6,348	180,135	360,600	H
District of Rainy River HL	1,983	741	267,611	483,883	H	2,422	687	352,547	564,138	H
District of Thunder Bay HL	3,666	819	447,619	491,324	H	3,224	741	435,088	599,160	H

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Table A3.5: Full results at Health Link-level, Case-mix group (CMG) 30-day readmission rate (%):

Health Link	2012					2014				
	Readm	CMG Hosps	Crude Estimate	Risk-Adj Estimate	Test	Readm	CMG Hosps	Crude Estimate	Risk-Adj Estimate	Test
Overall	13,849	70,139	19.75	.		14,585	74,570	19.56	.	
-Not Assigned to HL-	1,715	8,577	20	19.92		1,769	8,904	19.87	19.74	
LHIN 1: Erie St. Clair										
Chatham Kent HL	49	317	15.46	16.86		61	401	15.21	16.07	
Essex County South Shore HL	67	365	18.36	18.85		65	377	17.24	17.49	
Lambton County Lake Huron HL	153	967	15.82	16.32	L	146	956	15.27	15.81	L
LHIN2: South West										
Huron Perth HL*	162	827	19.59	20.17		145	883	16.42	17.18	
London Middlesex HL	598	2,571	23.26	22.56	H	618	2,772	22.29	21.55	H
North Grey Bruce HL	101	567	17.81	18.38		95	539	17.63	18.3	
South Grey Bruce HL	66	336	19.64	21.43		47	293	16.04	17.21	
LHIN 3: Waterloo Wellington										
Cambridge/North Dumfries HL	129	691	18.67	18.11		137	679	20.18	19.9	
Guelph HL*	117	627	18.66	18.95		182	788	23.1	22.58	H
Kitchener Waterloo HL	173	1,093	15.83	16.25	L	282	1,369	20.6	20.27	
Rural Wellington HL	80	416	19.23	20.4		95	491	19.35	19.96	
LHIN 4: HNB										
Brant Six Nations HL	177	918	19.28	19.16		187	946	19.77	19.99	
Burlington HL	179	889	20.13	20.15		195	983	19.84	20.49	
Haldimand HL	40	272	14.71	15.29		52	271	19.19	19.23	
Hamilton Central HL*	295	1,397	21.12	20.9		378	1,634	23.13	23	H
Hamilton East HL	208	1,118	18.6	18.9		283	1,456	19.44	19.68	
Hamilton West HL	195	1,014	19.23	19.33		179	980	18.27	17.98	
Niagara North East HL	232	1,215	19.09	19.4		216	1,234	17.5	17.96	
Niagara North West HL	59	291	20.27	20.65		57	277	20.58	21.3	
Niagara South East HL	154	748	20.59	19.97		117	727	16.09	16.36	L
Niagara South West HL	86	491	17.52	17.71		74	440	16.82	17.03	
Norfolk HL	79	443	17.83	18.26		96	464	20.69	20.38	
LHIN 5: Central West										
Bolton Caledon HL	21	169	12.43	13.02	L	34	186	18.28	18.14	
Bramalea and Area HL	118	619	19.06	18.92		147	769	19.12	19.02	
Brampton and Area HL	163	871	18.71	18.49		196	1,031	19.01	18.84	
Dufferin and Area HL*	41	240	17.08	18.01		53	273	19.41	19.38	
N Etobicoke, Malton, W Woodbridge HL*	192	887	21.65	22.03		162	940	17.23	17.27	
LHIN 6: Mississauga Halton										
East Mississauga HL*	297	1,622	18.31	18.25		313	1,643	19.05	18.88	
Halton Hills HL	54	302	17.88	18.14		48	249	19.28	20.51	
Milton HL	44	246	17.89	17.87		57	290	19.66	20.04	
North West Mississauga HL	83	538	15.43	15.74	L	151	678	22.27	22.05	
Oakville HL	143	936	15.28	15.84	L	167	1,008	16.57	17.11	
South Etobicoke HL	106	593	17.88	18.73		146	704	20.74	20.96	
South West Mississauga HL	90	492	18.29	18.41		94	551	17.06	17.1	
LHIN 7: Toronto Central										
Central West Toronto HL	95	462	20.56	20.18		102	469	21.75	20.83	
Don Valley/Greenwood HL*	155	747	20.75	19.85		174	776	22.42	20.8	
East Toronto HL*	212	899	23.58	22.68	H	197	979	20.12	20.2	
Mid East Toronto HL*	136	630	21.59	19.9		174	731	23.8	21.7	
Mid West Toronto HL*	364	1,921	18.95	18.55		472	2,292	20.59	19.79	
North East Toronto HL	172	807	21.31	22.26		177	860	20.58	20.92	
North West Toronto HL	124	678	18.29	19.22		141	777	18.15	19.02	
South Toronto HL	249	1,103	22.57	22.04	H	202	933	21.65	21.5	
West Toronto HL	79	455	17.36	17.63		65	359	18.11	18.67	

Notes: * indicates early adopter Health Links

Health Link	2012					2014				
	Readm	CMG Hosps	Crude Estimate	Risk-Adj Estimate	Test	Readm	CMG Hosps	Crude Estimate	Risk-Adj Estimate	Test
LHIN 8: Central										
North York Central HL*	422	2,227	18.95	19.72		455	2,283	19.93	20.32	
North York West HL	307	1,524	20.14	19.91		288	1,624	17.73	17.85	
S Simcoe and N York Region HL*	248	1,279	19.39	19.58		281	1,419	19.8	19.97	
Southeast York Region HL	163	867	18.8	18.93		186	969	19.2	19.14	
Southwest York Region HL	346	1,838	18.82	19.15		348	1,940	17.94	18.14	
LHIN 9: Central East										
Durham North East HL	261	1,423	18.34	18.46		304	1,483	20.5	20.4	
Haliburton and Kawartha Lakes HL	79	462	17.1	17.21		102	508	20.08	20.69	
Northumberland HL	69	409	16.87	17.27		83	464	17.89	17.87	
Peterborough HL*	157	853	18.41	18.65		197	1,018	19.35	19.74	
Scarborough North HL	168	852	19.72	20.67		152	880	17.27	17.67	
Scarborough South HL	364	1,766	20.61	20.64		364	1,945	18.71	19.12	
LHIN 10: South East										
Kingston HL*	260	1,015	25.62	23.92	H	197	1,028	19.16	18.56	
Quinte HL*	174	831	20.94	20.42		134	785	17.07	17.31	
Rideau Tay HL	58	291	19.93	20.11		45	258	17.44	18.43	
Rural Hastings HL*	54	273	19.78	19.37		66	317	20.82	20.57	
Rural Kingston HL*	29	116	25	24.23		28	117	23.93	22.59	
Salmon River HL	28	149	18.79	17.49		27	150	18	18.99	
Thousand Islands HL*	113	595	18.99	18.87		102	571	17.86	18.32	
LHIN 11: Champlain										
Arnprior Region and Ottawa West HL	103	489	21.06	21.05		100	541	18.48	18.25	
Central Ottawa HL	374	1,894	19.75	19.65		358	1,792	19.98	19.83	
North Renfrew County HL	94	460	20.43	20.92		103	509	20.24	20.02	
Prescott-Russell Regional HL	68	377	18.04	18.17		72	393	18.32	18.95	
South Ottawa and North Grenville HL	108	539	20.04	20.29		145	706	20.54	20.43	
South Renfrew HL	34	236	14.41	15.27		41	251	16.33	16.8	
SGCA HL	182	747	24.36	22.55	H	172	772	22.28	21.44	
Upper Canada HL	89	346	25.72	24.27	H	74	448	16.52	16.43	
LHIN 12: North Simcoe Muskoka										
Barrie Community HL*	138	749	18.42	18.65		180	908	19.82	19.9	
Couchiching Community HL	97	468	20.73	20.3		89	449	19.82	20.05	
Muskoka Community HL	64	386	16.58	16.96		71	412	17.23	17.85	
North Simcoe Community HL	78	454	17.18	17.87		81	478	16.95	17.46	
South Georgian Bay Community HL*	80	408	19.61	20.03		116	530	21.89	22.15	
LHIN 13: North East										
Nipissing East Parry Sound HL	170	811	20.96	21.02		189	889	21.26	21.48	
North Cochrane HL	38	149	25.5	25.02		38	191	19.9	19.74	
Sault Ste. Marie HL	182	874	20.82	20.72		173	857	20.19	19.94	
Temiskaming HL*	59	298	19.8	19.08		68	321	21.18	21.38	
Timmins HL*	141	603	23.38	22.37		105	494	21.26	20.44	
LHIN 14: North West										
City of Thunder Bay HL	321	1,396	22.99	21.98	H	254	1,247	20.37	19.77	
District of Rainy River HL	46	175	26.29	25.19		29	146	19.86	20.2	
District of Thunder Bay HL	31	143	21.68	21.38		20	114	17.54	17.46	

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Table A3.6: Full results at Health Link-level, Case-Mix Group Primary Care 7-day Follow-up (%):

Health Link	2012				2014			
	Prim Care Followup	CMG Hosps	Crude Estimate	Test	Prim Care Followup	CMG Hosps	Crude Estimate	Test
Overall	25,335	75,129	33.72		27,642	80,041	34.53	
-Not Assigned to HL-	2,964	9,214	32.17	L	3,077	9,546	32.23	L
LHIN 1: Erie St. Clair								
Chatham Kent HL	114	348	32.76		151	440	34.32	
Essex County South Shore HL	134	387	34.63		153	415	36.87	
Lambton County Lake Huron HL	290	1,034	28.05	L	281	1,022	27.5	L
LHIN2: South West								
Huron Perth HL*	258	884	29.19	L	294	941	31.24	L
London Middlesex HL	925	2,763	33.48		916	2,972	30.82	L
North Grey Bruce HL	149	606	24.59	L	152	559	27.19	L
South Grey Bruce HL	81	354	22.88	L	108	315	34.29	
LHIN 3: Waterloo Wellington								
Cambridge and North Dumfries HL	257	725	35.45		259	721	35.92	
Guelph HL*	233	670	34.78		289	847	34.12	
Kitchener Waterloo HL	351	1,173	29.92	L	444	1,454	30.54	L
Rural Wellington HL	145	449	32.29		177	526	33.65	
LHIN 4: HNIB								
Brant Six Nations HL	301	985	30.56	L	347	1,012	34.29	
Burlington HL	360	957	37.62	H	428	1,043	41.04	H
Haldimand HL	101	301	33.55		116	292	39.73	
Hamilton Central HL*	407	1,505	27.04	L	512	1,747	29.31	L
Hamilton East HL	331	1,212	27.31	L	528	1,554	33.98	
Hamilton West HL	332	1,092	30.4	L	322	1,054	30.55	L
Niagara North East HL	549	1,307	42	H	552	1,330	41.5	H
Niagara North West HL	133	310	42.9	H	164	296	55.41	H
Niagara South East HL	326	806	40.45	H	325	770	42.21	H
Niagara South West HL	214	527	40.61	H	213	469	45.42	H
Norfolk HL	159	468	33.97		159	504	31.55	
LHIN 5: Central West								
Bolton Caledon HL	83	185	44.86	H	90	197	45.69	H
Bramalea and Area HL	299	653	45.79	H	398	825	48.24	H
Brampton and Area HL	393	923	42.58	H	484	1,101	43.96	H
Dufferin and Area HL*	90	262	34.35		117	289	40.48	H
N Etobicoke, Malton, W Woodbridge HL*	367	950	38.63	H	444	1,013	43.83	H
LHIN 6: Mississauga Halton								
East Mississauga HL*	628	1,716	36.6	H	675	1,758	38.4	H
Halton Hills HL	133	324	41.05	H	138	279	49.46	H
Milton HL	127	260	48.85	H	150	306	49.02	H
North West Mississauga HL	193	580	33.28		240	731	32.83	
Oakville HL	420	1,004	41.83	H	486	1,069	45.46	H
South Etobicoke HL	218	639	34.12		272	766	35.51	
South West Mississauga HL	227	518	43.82	H	241	598	40.3	H
LHIN 7: Toronto Central								
Central West Toronto HL	179	502	35.66		199	514	38.72	H
Don Valley/Greenwood HL*	269	802	33.54		295	837	35.24	
East Toronto HL*	355	963	36.86	H	359	1,062	33.8	
Mid East Toronto HL*	220	679	32.4		288	791	36.41	
Mid West Toronto HL*	716	2,060	34.76		829	2,454	33.78	
North East Toronto HL	324	864	37.5	H	331	927	35.71	
North West Toronto HL	271	714	37.96	H	339	838	40.45	H
South Toronto HL	402	1,177	34.15		342	1,029	33.24	
West Toronto HL	173	485	35.67		125	383	32.64	

Notes: * indicates early adopter Health Links

Health Link	2012				2014			
	Prim Care Followup	CMG Hosps	Crude Estimate	Test	Prim Care Followup	CMG Hosps	Crude Estimate	Test
LHIN 8: Central								
North York Central HL*	856	2,385	35.89	H	917	2,442	37.55	H
North York West HL	625	1,617	38.65	H	633	1,747	36.23	
S Simcoe and N York Region HL*	596	1,382	43.13	H	612	1,527	40.08	H
Southeast York Region HL	350	915	38.25	H	375	1,037	36.16	
Southwest York Region HL	811	1,964	41.29	H	871	2,093	41.61	H
LHIN 9: Central East								
Durham North East HL	550	1,502	36.62	H	535	1,583	33.8	
Haliburton and Kawartha Lakes HL	185	500	37		202	537	37.62	
Northumberland HL	118	448	26.34	L	131	498	26.31	L
Peterborough HL*	258	918	28.1	L	342	1,106	30.92	L
Scarborough North HL	314	900	34.89		350	942	37.15	
Scarborough South HL	652	1,903	34.26		723	2,090	34.59	
LHIN 10: South East								
Kingston HL*	392	1,090	35.96		405	1,105	36.65	
Quinte HL*	288	892	32.29		278	837	33.21	
Rideau Tay HL	76	307	24.76	L	74	274	27.01	L
Rural Hastings HL*	105	291	36.08		115	338	34.02	
Rural Kingston HL*	37	124	29.84		43	124	34.68	
Salmon River HL	45	157	28.66		45	161	27.95	
Thousand Islands HL*	213	641	33.23		222	603	36.82	
LHIN 11: Champlain								
Arnprior Region and Ottawa West HL	161	524	30.73		208	581	35.8	
Central Ottawa HL	669	2,038	32.83		636	1,953	32.57	
North Renfrew County HL	144	489	29.45	L	149	559	26.65	L
Prescott-Russell Regional HL	152	405	37.53		150	423	35.46	
South Ottawa and North Grenville HL	193	575	33.57		239	752	31.78	
South Renfrew HL	69	250	27.6	L	84	269	31.23	
SGCA HL	220	800	27.5	L	222	839	26.46	L
Upper Canada HL	126	378	33.33		165	474	34.81	
LHIN 12: North Simcoe Muskoka								
Barrie Community HL*	235	806	29.16	L	293	977	29.99	L
Couchiching Community HL	137	496	27.62	L	166	476	34.87	
Muskoka Community HL	148	422	35.07		166	434	38.25	
North Simcoe Community HL	147	495	29.7		139	520	26.73	L
South Georgian Bay Community HL*	168	430	39.07	H	211	560	37.68	
LHIN 13: North East								
Nipissing East Parry Sound HL	214	866	24.71	L	234	943	24.81	L
North Cochrane HL	39	157	24.84	L	47	210	22.38	L
Sault Ste. Marie HL	207	931	22.23	L	247	908	27.2	L
Temiskaming HL*	61	320	19.06	L	63	350	18	L
Timmins HL*	172	631	27.26	L	154	539	28.57	L
LHIN 14: North West								
City of Thunder Bay HL	325	1,495	21.74	L	310	1,351	22.95	L
District of Rainy River HL	48	187	25.67	L	47	158	29.75	
District of Thunder Bay HL	28	161	17.39	L	30	125	24	L

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall and Akwesasne Health Link

Table A3.7: Full results at Health Link-level, Patients enrolled in a Primary Care Model (%):

Health Link	2012					2014				
	Pop on Roster	Pop Size	Crude Estimate	Std Estimate	Test	Pop on Roster	Pop Size	Crude Estimate	Std Estimate	Test
Overall	413,412	514,848	80.3	73.3		442,336	546,450	81.0	73.1	
-Not Assigned to HL-	48,705	60,468	80.6	71.7		51,482	63,537	81.0	69.8	L
LHIN 1: Erie St. Clair										
Chatham Kent HL	1,843	2,099	87.8	84.6	H	2,075	2,610	79.5	78.4	
Essex County South Shore HL	2,110	2,571	82.1	79.9		2,543	2,798	90.9	84.0	H
Lambton County Lake Huron HL	5,327	6,221	85.6	75.0		5,303	6,184	85.8	75.9	
LHIN2: South West										
Huron Perth HL*	4,159	4,701	88.5	88.8	H	4,326	4,943	87.5	88.9	H
London Middlesex HL	13,462	17,062	78.9	67.1	L	14,687	18,990	77.3	65.0	L
North Grey Bruce HL	2,750	3,399	80.9	79.9		2,733	3,307	82.6	84.2	H
South Grey Bruce HL	1,529	1,775	86.1	86.1	H	1,540	1,823	84.5	85.8	H
LHIN 3: Waterloo Wellington										
Cambridge and North Dumfries HL	4,061	4,862	83.5	77.1		4,072	5,014	81.2	78.0	
Guelph HL*	3,215	4,159	77.3	67.1	L	3,338	4,365	76.5	63.3	L
Kitchener Waterloo HL	7,151	9,826	72.8	63.9	L	7,820	10,587	73.9	64.6	L
Rural Wellington HL	2,279	2,711	84.1	79.6		2,377	2,803	84.8	82.0	H
LHIN 4: HNIB										
Brant Six Nations HL	4,345	5,104	85.1	78.8		4,286	5,137	83.4	77.7	
Burlington HL	6,858	7,652	89.6	81.9	H	7,641	8,436	90.6	84.0	H
Haldimand HL	1,614	1,901	84.9	76.3		1,701	1,962	86.7	81.3	
Hamilton Central HL*	6,625	8,767	75.6	72.5		7,414	9,477	78.2	76.0	
Hamilton East HL	5,691	6,819	83.5	74.0		7,551	8,735	86.5	80.2	H
Hamilton West HL	5,453	6,540	83.4	77.2		5,698	6,620	86.1	77.9	
Niagara North East HL	8,836	10,323	85.6	80.8	H	9,553	11,149	85.7	77.3	
Niagara North West HL	1,912	2,270	84.2	81.5		1,917	2,271	84.4	80.0	
Niagara South East HL	4,789	5,549	86.3	78.6		5,176	6,118	84.6	77.5	
Niagara South West HL	3,055	3,914	78.1	69.2		3,172	4,123	76.9	72.0	
Norfolk HL	2,339	2,677	87.4	85.9	H	2,210	2,786	79.3	81.6	
LHIN 5: Central West										
Bolton Caledon HL	1,324	1,578	83.9	73.5		1,476	1,718	85.9	79.4	
Bramalea and Area HL	5,186	6,343	81.8	77.6		5,897	7,271	81.1	74.5	
Brampton and Area HL	6,774	8,352	81.1	78.2	H	7,796	9,572	81.5	77.2	H
Dufferin and Area HL*	1,544	1,821	84.8	87.2	H	1,617	1,859	87.0	81.4	
N Etobicoke, Malton, W Woodbridge HL*	5,725	7,291	78.5	73.3		6,853	8,400	81.6	75.5	
LHIN 6: Mississauga Halton										
East Mississauga HL*	9,633	12,636	76.2	71.1		10,746	13,930	77.1	73.8	
Halton Hills HL	1,774	1,957	90.7	80.2		1,722	1,915	89.9	78.7	
Milton HL	1,691	2,005	84.3	80.1		1,912	2,302	83.1	78.6	
North West Mississauga HL	4,584	5,539	82.8	74.9		4,881	5,778	84.5	78.7	H
Oakville HL	6,320	7,354	85.9	75.4		6,678	7,842	85.2	75.8	
South Etobicoke HL	3,382	4,456	75.9	71.8		4,226	5,052	83.7	74.7	
South West Mississauga HL	3,538	4,456	79.4	76.8		4,167	5,171	80.6	75.2	
LHIN 7: Toronto Central										
Central West Toronto HL	2,123	3,287	64.6	62.4	L	1,863	3,333	55.9	49.3	L
Don Valley/Greenwood HL*	4,695	6,010	78.1	67.3	L	4,734	5,774	82.0	73.4	
East Toronto HL*	4,994	7,634	65.4	64.5	L	5,542	7,683	72.1	66.8	L
Mid East Toronto HL*	3,540	4,835	73.2	68.9		3,798	5,065	75.0	67.6	L
Mid West Toronto HL*	12,572	16,326	77.0	71.0		13,726	17,587	78.1	69.8	L
North East Toronto HL	4,764	6,399	74.5	69.0		5,027	6,444	78.0	72.6	
North West Toronto HL	4,138	5,551	74.6	56.7	L	4,193	5,578	75.2	56.0	L
South Toronto HL	5,109	7,383	69.2	65.3	L	4,696	6,918	67.9	62.1	L
West Toronto HL	2,246	3,088	72.7	64.2	L	1,919	2,721	70.5	57.1	L

Notes: * indicates early adopter Health Links

Health Link	2012					2014				
	Pop on Roster	Pop Size	Crude Estimate	Std Estimate	Test	Pop on Roster	Pop Size	Crude Estimate	Std Estimate	Test
LHIN 8: Central										
North York Central HL*	14,852	17,897	83.0	76.8		15,411	18,564	83.0	74.0	
North York West HL	10,754	13,328	80.7	71.6		11,474	13,884	82.6	73.9	
S Simcoe and N York Region HL*	8,755	9,989	87.7	85.5	H	9,743	11,357	85.8	81.4	H
Southeast York Region HL	6,854	8,128	84.3	75.6		7,589	9,006	84.3	74.2	
Southwest York Region HL	12,900	15,572	82.8	72.1		15,338	18,198	84.3	73.2	
LHIN 9: Central East										
Durham North East HL	10,563	12,041	87.7	81.6	H	10,150	11,878	85.5	77.2	H
Haliburton and Kawartha Lakes HL	2,812	3,622	77.6	65.8		2,974	3,584	83.0	70.9	
Northumberland HL	2,368	2,764	85.7	78.2		2,353	2,818	83.5	79.4	
Peterborough HL*	5,745	6,652	86.4	70.2		5,642	6,790	83.1	67.3	L
Scarborough North HL	6,395	7,895	81.0	72.6		6,903	8,277	83.4	75.2	
Scarborough South HL	12,690	15,379	82.5	78.0	H	14,256	17,008	83.8	77.3	H
LHIN 10: South East										
Kingston HL*	5,565	6,529	85.2	85.0	H	5,711	6,820	83.7	81.8	H
Quinte HL*	4,636	5,357	86.5	81.8	H	4,511	5,249	85.9	79.6	H
Rideau Tay HL	1,403	1,814	77.3	71.5		1,343	1,824	73.6	65.4	
Rural Hastings HL*	1,691	2,257	74.9	67.8		1,806	2,347	77.0	70.1	
Rural Kingston HL*	610	697	87.5	84.8		714	805	88.7	87.9	
Salmon River HL	700	895	78.2	66.1		690	975	70.8	67.5	
Thousand Islands HL*	2,566	3,518	72.9	65.7	L	2,580	3,383	76.3	66.3	L
LHIN 11: Champlain										
Arnprior Region and Ottawa West HL	3,493	4,201	83.2	79.2		3,878	4,693	82.6	78.9	
Central Ottawa HL	11,223	15,266	73.5	68.9	L	10,926	14,922	73.2	68.4	L
North Renfrew County HL	1,383	2,411	57.4	57.2	L	1,552	2,559	60.7	60.2	L
Prescott-Russell Regional HL	2,043	2,367	86.3	85.0	H	1,851	2,272	81.5	85.3	H
South Ottawa and North Grenville HL	3,526	4,698	75.1	68.9		4,439	5,677	78.2	72.3	
South Renfrew HL	1,406	1,734	81.1	79.3		1,483	1,861	79.7	71.4	
SGCA HL	2,449	3,620	67.7	50.2	L	2,510	3,705	67.8	49.1	L
Upper Canada HL	1,773	2,108	84.1	77.5		2,358	2,730	86.4	79.9	
LHIN 12: North Simcoe Muskoka										
Barrie Community HL*	4,456	5,655	78.8	68.8		5,160	6,263	82.4	72.6	
Couchiching Community HL	2,754	3,169	86.9	81.3		2,943	3,256	90.4	86.6	H
Muskoka Community HL	2,114	2,643	80.0	69.9		2,323	2,724	85.3	76.1	
North Simcoe Community HL	2,240	2,675	83.7	65.2	L	2,210	2,635	83.9	65.1	L
South Georgian Bay Community HL*	2,238	2,592	86.3	81.1		2,573	2,909	88.5	80.6	
LHIN 13: North East										
Nipissing East Parry Sound HL	3,206	4,312	74.4	66.8		2,932	4,335	67.6	61.3	L
North Cochrane HL	596	926	64.4	60.4	L	589	866	68.0	64.6	
Sault Ste. Marie HL	3,410	3,971	85.9	74.8		4,023	4,440	90.6	82.3	H
Temiskaming HL*	951	1,481	64.2	59.5		965	1,409	68.5	72.2	
Timmins HL*	2,301	2,811	81.9	70.4		2,481	2,963	83.7	70.4	
LHIN 14: North West										
City of Thunder Bay HL	4,973	6,643	74.9	65.2	L	4,779	6,348	75.3	66.0	L
District of Rainy River HL	586	741	79.1	68.4		511	687	74.4	73.9	
District of Thunder Bay HL	668	819	81.6	76.1		578	741	78.0	76.4	

Notes: * indicates early adopter Health Links; SGCA = Stormont, Glengarry, Cornwall, and Akwesasne Health Link