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Assessing Value in Ontario Health Links. Part 4: Measures of Palliative Care and End-of-Life Care

Health System Performance Research Network
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Executive Summary

Context

Ontario's Health Links (HLs) initiative was announced in December 2012 to improve the coordination of care provided to patients with the most complex healthcare needs. This group of patients represents a small minority of Ontario's population (5%), but accounts for a majority of all health system costs (66%). Each HL is given the flexibility to identify a target population of high-needs patients and flexibility to improve integration of care. Given the considerable efforts that are currently being invested in HLs, reporting on their performance is an important priority.

Objective

In this report, we measure the performance of HLs using health administrative data, focusing specifically on palliative care and end-of-life populations. These groups may be of particular interest to HL leaders because palliative and end-of-life patients are often vulnerable individuals that frequently access multiple health care providers across many sectors, resulting in high costs. This report builds on our prior Applied Health Research Question (AHRQ) report *Measures of System Performance in Ontario's Health Links* and our reports on describing characteristics of palliative and end-of-life patients in Ontario.

Methods

Two study populations were examined:

1. a palliative cohort that included all Ontarians with a valid health card discharged home after an acute care hospitalization indicating that the patient was palliative

and

2. an end-of-life cohort that included all decedents in 2012.

In each population, individuals were assigned to a HL based on the location of their usual provider of care or their home residence. At time of writing, 67 HLs were defined by the MOHLTC based on geographical catchment areas.

Seven indicators, selected because of their endorsement by the Hospice Palliative Care Data and Performance Measurement Subcommittee or from previous HSPRN studies, are reported on. These include 3 specific to palliative (hospital) care:

1. Home support for palliative patients;
2. Emergency Department (ED) visits within 30 days for discharged palliative patients;
3. Palliative hospital readmissions;

and 4 indicators specific to end-of-life care:

1. Unscheduled ED visits in the last 2 weeks preceding death;
2. Total costs at the end of life;
3. Proportion of deaths in hospital;
4. Days in hospital at the end of life.

Health Link performance for each indicator was compared to the provincial average and stratified according to unique HL characteristics, including their degree of rurality (urban, suburban, and rural), material deprivation index (quintile-ranked), type of lead organization (community care access centre, community health centre, hospital, family health team, and other) and health region (Local Health Integration Network or LHIN).

Findings

A total of 8,950 palliative discharges were identified among Ontarians in fiscal year 2012. Large variations in HL performance specific to palliative care were observed. Following discharge, HLs in more rural areas had the lowest proportion of patients that received home support, but also the highest proportion of patients that visited an ED. No trends by HL socio-economic status or lead organization type were consistently found across all indicators.

For measures of end-of-life care, 91,130 Ontarian decedents were identified in 2012. Health Links in the least deprived quintile (highest socio-economic group) generally performed more desirably than HLs in lower socio-economic groups for end-of-life indicators. Further, in contrast to rural and suburban HLs, decedents in urban HLs were also found to have higher average costs in the last year of life, spent more time in hospital in the last 30 days of life, and more often died in hospital.

For both palliative care and end-of-life care indicators, pockets of high (and low) performance – where one HL consistently performs well (or poorly) – were observable. For many indicators, particularly end-of-life indicators, HLs within each LHIN had similar performance indicating strong LHIN-level variation across the province.

Conclusions

Across 67 geographically defined HLs, we found substantial variation in performance for seven indicators of palliative care and end-of-life care. We found that much of the variation in HL performance appeared at the LHIN rather than at the HL level suggesting that opportunities to improve palliative care should be undertaken across entire LHINs. Evaluating the performance of HLs and their effects on patient care and patient outcomes requires the ability to identify which Ontarians are enrolled in HL programs. As this roster was not yet available at the time of writing, the present work describes population trends of Ontarians in HL geographies, considering two vulnerable and high-needs populations that the HLs may wish to target their services towards. The significant variation in performance for palliative and end-of-life care across HLs suggests existing differences in the level and quality of such care across the province. More importantly, it suggests that there is room for improvement across many HLs; findings from this work create a baseline portrait that can be used for future benchmarking of performance.

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Context

Health Links (HLs) were announced in December 2012 as a means to improve the delivery of coordinated health care services for Ontarians, with an initial focus on complex, high-needs patients. Each HL has the flexibility to propose its own strategies to identify target high-needs populations, as well as strategies to improve integration of care. The first set of 22 'early adopter' HLs commenced in August 2013, and since then, more have been approved. The flexibility and customization of HLs, along with the variation in stages of maturity, increases the impetus to measure HL performance. This report does so on indicators of end-of-life and palliative care – to establish baseline portraits on a universally complex population – that can be used to inform benchmarking for future efforts for improvement.

This report builds on our prior reports that assess the baseline performance of HLs (Kromm et al., 2015; Mery et al., 2015; Mery and Wodchis, 2014) and that describe the health care use and costs associated with palliative and end-of-life care in Ontario (Tanuseputro et al., 2014; 2013). Here, we focus on defining and describing measures of palliative care and end-of-life care across the HLs. Although often used interchangeably, palliative care refers to care provided to individuals facing life-threatening illness that focuses on relieving pain, providing comfort and improving overall quality of life, as opposed to curative care. End of life, in contrast, more broadly involves care for individuals considered terminally ill, and as such regularly includes palliative care patients. Palliative care can commence before the end-of-life period, and typically intensifies as death approaches. Palliative and end-of-life populations are commonly comprised of older, frail adults with multiple needs, and they are known to consume a substantial portion of Ontario's health care budget (Tanuseputro et al., 2015). Therefore, these groups are important HL target populations in their efforts to improve patient-centered and integrated care.

Objectives

In the current work, we aim to describe the performance of HLs on measurable indicators related to palliative care and end-of-life care. To do so, we used linked, encoded health care data held at the Institute for Clinical Evaluative Sciences (ICES). For each indicator, we report values for each HL in reference to provincial averages. We also grouped and stratified HL performance by rurality, by material deprivation index, and by lead organization type. At the time of writing, the Ministry of Health and Long-Term Care (MOHLTC) have defined 67 HLs based on geographical catchment areas.

Methods

Study Populations

Consistent with our previous HL report (Kromm et al., 2015) using health administrative data, we identified all residents of Ontario with an OHIP number valid on April 1, 2012 (index date). We excluded individuals older than 105 years of age and those that did not have any contact with the health care system after April 1, 2008. From this population, 2 cohorts of interest were captured:

1. **Palliative (hospitalized) Cohort**: includes all individuals discharged home in fiscal year 2012 (from April 1, 2012 to March 31, 2013) after a hospital admission that indicated that the patient was palliative. Because an individual can have more than one palliative hospital discharge during the year, the unit of analysis for this cohort are hospital discharges. Indicators for this cohort look at a specified period following discharge from hospital (prospective approach).

2. **End-of-Life Cohort**: includes all decedents in fiscal year 2012, as identified by the date of death in the Ontario Registered Persons Database (RPDB). All causes of death are included in this cohort. Indicators applied to this population look back in time at the care provided to an individual for a specified period prior to death (retrospective approach).

Palliative and End-of-life Indicators

We selected 7 indicators, 3 specific to palliative care and 4 specific to end-of-life care (Table 1). Four of these indicators were developed, and deemed "actionable" by the Hospice Palliative Care Data and Performance Measurement Subcommittee (Amuah et al., *forthcoming*). Other indicators were chosen based on an HSPRN study that reviewed end-of-life health performance indicators that are measurable by health administrative data in Ontario (Tanuseputro et al., 2015; *forthcoming*). These indicators were previously categorized as either priority indicators (i.e., performance or accountability indicators) or explanatory indicators (i.e., those that support priority indicators). Each is described below. For additional indicator details including the data sources used in this work, refer to Appendix 1. HSPRN, following this report, will continue to develop and measure palliative and end-of-life indicators for each health care sector.

1. Palliative Care (priority indicator): Home support for discharged palliative patients

Defined as the proportion of patients identified as palliative in hospital, that were discharged home with meaningful community support. We defined meaningful support as receiving publically funded, palliative home care (service recipient code of end of life) from Community Care Access Centers within 90 days of discharge. Such a designation will vastly increase the level of support hours an individual is eligible for in their home, and often involves care from a specialist palliative care team. Community-based support for palliative patents recently discharged from hospital can aid in maintaining health-related quality of life as well as delay readmissions and prevent further institutionalizations. Current HSPRN work is also showing that palliative home care vastly increases a person's chance for dying in the community, outside of hospital settings (Tanuseputro et al., *forthcoming*). Readers should note that unlike all other indicators presented in this report, a high value is desirable (and is considered to reflect high performance) for *home support for discharged palliative patients*.

2. Palliative Care (priority indicator): Emergency Department (ED) visits within 30 days for discharged palliative patients

Defined as the proportion of patients discharged home after being identified as palliative in hospital that have one or more unscheduled emergency department (ED) visits within 30 days of discharge.

Measuring unscheduled ED visits among patients discharged from inpatient care may be used to measure institutional or regional quality of care and care coordination in the community. Although not all ED visits are avoidable, interventions initiated during the hospital stay and/or in the community can be effective in reducing ED use after discharge. Lower values are desirable.

3. Palliative Care (priority indicator): Palliative hospital readmission rate

Defined as the proportion of patients identified as palliative in hospital and discharged to home that was readmitted to acute care within 30 days of discharge. As is the case for ED visits, not all readmissions are avoidable. However, hospital readmissions may indicate poor discharge planning and community-based follow-up care, and result in high economic costs. Lower values are desirable.

4. End-of-life Care (priority indicator): ED visits in the last two weeks preceding death

Defined as the proportion of decedents with one or more (unscheduled) emergency room visits in the last 2 weeks of life. Transitions between care setting in the last two weeks of life can be burdensome on patients and their families, and ED use at the end of life may indicate poor care supports. Lower values are desirable.

5. End-of-life Care (explanatory variable): Total cost at the end of life

Defined as the average total government costs in the last year of life among decedents, adjusted for inflation and reported in 2011 Canadian dollars. Higher costs at the end of life is burdensome for the health care system and may be reflective of increased time spent in inpatient care, or increased number of care transitions. Recent HSPRN work has shown that the average health care costs in the last year of life is $53,700 with 43% of these costs being attributable to inpatient care (Tanuseputro et al., 2015). Lower values are desirable.

6. End-of-life Care (explanatory variable): Proportion of deaths in hospital

Defined as the proportion of decedents that died in hospital. This indicator was selected because most end-of-life patients, as well as their families, express a wish to die at home and out of hospital (Gomes et al., 2013; Bluebond-Langner et al., 2013). Therefore, lower values are desirable for this indicator.

7. End-of-life Care (explanatory variable): Days in hospital at the end of life

This indicator describes the mean number of days in hospital in the last 30 days of life among decedents in fiscal year 2012. As above, this indicator is reflective of patient-centered care at the end of life. Furthermore, hospital steeply rises at the end of life and drives the large majority of total cost. Lower values are desirable.

Table 1: Selected indicators for palliative care and end-of-life care

	Indicator	Type
Palliative Care Indicators		
1	Home support for palliative patients	Priority
2	ED visits within 30 days for discharged palliative patients	Priority
3	Palliative hospital readmission rate	Priority
End-of-life Care Indicators		
4	Unscheduled ED visits in the last 2 weeks preceding death	Priority
5	Total cost at the end of life (HSPRN)	Explanatory
6	Proportion of deaths in hospital (HSPRN)	Explanatory
7	Days in hospital at the end of life (HSPRN)	Explanatory

*Note: indicators 1 through 4 were developed for the Hospice Palliative Care Data and Performance Measurement Subcommittee; indicators 5 through 7 by the HSPRN. These indicators were previously categorized as either priority indicators (i.e., performance or accountability indicators) or explanatory indicators (i.e., those that support priority indicators).

Unit of Analysis: Health Links

A list of the 67 geographically defined HLs and their corresponding catchment areas defined by postal codes, was obtained from the MOHLTC and linked to data housed at ICES. From this linkage we assigned each Ontarian in the above cohorts (palliative and end-of-life) to a unique HL in a three-step process (in order):

1. Based on the postal code of the primary care physician an individual was rostered to at the index date
2. For individuals not rostered to a primary care physician, based on the postal code of the individual's usual provider of primary care (UPC). A UPC was defined as the general practitioner, family physician, or pediatrician that an (unrostered) individual visited most frequently during the two years prior to the index date
3. For individuals not rostered to a physician and without a UPC, assignment to a HL was based on the postal code of the individual's residence

We linked Ontarians to a HL based on their primary care physician/UPC's postal code because, first, the physician that a patient is rostered to is contractually responsible for that patient's primary care, and second, because it is possible for an individual to live in one HL but always receive care based on the model of another HL (where his or her primary care physician practices). This is often the case in urban areas: in our previous assessment of HLs (Kromm et al., 2015), only 43.5% of urban-residing Ontarians lived in the same HL that their primary care physician practiced (compared to 76.0% and 80.0% in suburban and rural areas, respectively). In some cases, these two HLs may be similar, but in others there may be significant differences. Linking individuals to a HL via their primary care provider's location allowed us to capture the performance of HLs based on individuals that received care from providers in that HL. Finally, linking Ontarians to a HL through their residential location ensured that those living within the geographical boundaries of a HL, but not rostered to a physician or without a UPC, are captured and not grouped with Ontarians who live in areas of the province without a HL.

Area-level characteristics used to group and compare similar HLs included rurality, material deprivation index and lead organization type. Each characteristic is described below. In addition, the 22 initial or early adopter HLs were also identified.

Rurality:

The 2008 Rurality Index of Ontario (RIO) (Kralj, 2009) was used to measure rurality for each HL by assigning the median RIO score among all Ontarians assigned to a HL. This was based on all Ontarians eligible for inclusion to the study cohorts at the index date. Following the thresholds used in previous work by ICES scientists (Stukel et al., 2013), urban HLs were designated as those with an RIO score less than 10, suburban HLs as those with an RIO score of 10 to 39, and rural HLs as those with an RIO score greater than or equal to 40.

Material deprivation:

Material deprivation, based on the Ontario Marginalization Index (ON-Marg, (Matheson et al., 2012)), was used to show differences in socio-economic status between areas of Ontario and to understand inequalities between geographical units. We followed the methodology of Matheson et al. (2012) to aggregate dissemination area factor scores to the level of HLs. The deprivation of the region served by each HL was categorized into one of five equal-sized groups (quintiles) based on the distribution of these weighted ON-Marg deprivation scores, ranked from 1 (least deprived quintile) to 5 (most deprived quintile). The Index combines 6 measures of social disadvantage (Proportion of the population aged 20+ without a high-school diploma; Proportion of families who are lone parent families; Proportion of the population receiving government transfer payments; Proportion of the population aged 15+ who are unemployed; Proportion of the population considered low income (Statistics Canada low income cut off); Proportion of households living in dwellings that are in need of major repair).

Lead Organization Type/ Category:

A list of the lead organization for each HL was provided by the MOHLTC. Each HL was grouped into 1 of 5 mutually exclusive categories, including: Community Care Access Centre (CCAC), Community Health Centre (CHC), Family Health Team (FHT), Hospital (Hosp), and other (which included all non-CHC or –CCAC community services agencies, as well as mental health agencies, and public health agencies).

Data Analysis

Descriptive characteristics of discharges (palliative cohort) and decedents (end-of-life cohort) were derived from the health administrative data and are reported for all of Ontario, as well as for rural HLs, suburban HLs, urban HLs and among those that were not assigned to one of the 67 HLs.

For each indicator evaluated, we described the range in values across the 67 HLs by grouping the HLs into 10 equal sized groups (deciles) based on their performance. High performers were defined as those in the top 10%; low performers were defined as those in the bottom 10% (opposite assignment for the negative-oriented ED visit indicator). We reported ranges for highest and lowest deciles.

Second, a comparative approach was taken to assess baseline performance of each of the 67 HLs, with respect to palliative care and end-of-life care. Here, the values for each HL were compared to overall provincial averages for that indicator. HLs were also compared to provincial averages according to strata defined by rurality, material deprivation index (quintile), and type of lead organization. All indicator estimates are presented in tables with colour shading to aid in interpretation and to reveal pockets of high and low performance, where:

- Shades of RED = values worse than the provincial average
- Shades of GREEN = values better than the provincial average
- Values that are statistically different (worse or better) than the provincial average at a 5% level of significance are indicated by an "†" symbol beside their score
- Red asterisk = HL performing in the bottom 10 percent (decile) of all HLs for that indicator
- Green asterisk = HL performing in the top 10 percent (decile) of all HLs for that indicator

In addition to tables, caterpillar plots were generated to visualize the distribution of indicator estimates across HLs relative to Ontario averages, and to compare trends across HLs grouped by rurality, deprivation index, and lead organization type. Caterpillar plots display HL performance scores and corresponding 95% confidence intervals (95% CI) from highest to lowest values.

In all analyses, indicator estimates are presented as crude estimates. Small cells (events < 6) are suppressed due to data privacy issues. Further, HL estimates based on a population (denominator) of 30 or less were not considered reliable and are therefore not reported.

Approval for this work was granted by the institutional review board at Sunnybrook Health Sciences Centre in Toronto, Canada.

Findings

Health Link Characteristics

Table 2, found on pages 7 and 8, presents the list of 67 HLs included in analyses, select HL characteristics (early adopters, rurality, material deprivation quintile, and lead organization type), the total number of all Ontarians assigned to each HL based on the inclusion criteria, and study population counts for the palliative cohort and end-of-life cohort.

Of note, the majority of HLs were classified as urban (n= 36, 53.7%), followed by suburban (n=19, 28.4%) and rural (n=12, 17.9%).

Table 2: List of 67 Health Links included in analyses and select characteristics

Health Link Name	Early Adopter (n=22)	Rurality	Material Deprivation Quintile	Lead Org. Type	Total No. Assigned to HL	No. Palliative Discharges	No. Decedents (% of Total No. Assigned)
LHIN 1: Erie St. Clair							
Chatham Kent Health Link		Suburban	5	CHC	64,086	33	558 (0.87)
LHIN 2: South West							
Huron-Perth Health Link	Yes	Rural	3	FHT	140,843	76	1263 (0.9)
London Middlesex Health Link		Urban	3	FHT	499,123	232	3612 (0.72)
North Grey Bruce Health Link		Rural	3	Hosp.	83,265	34	909 (1.09)
South Grey Bruce Health Link		Rural	2	CHC	56,190	48	574 (1.02)
LHIN 3: Waterloo Wellington							
Cambridge Health Link		Urban	2	CHC	144,178	81	936 (0.65)
Guelph Health Link	Yes	Urban	1	FHT	151,167	78	940 (0.62)
Kitchener Waterloo Health Link		Urban	2	FHT	388,436	302	2443 (0.63)
Rural Wellington Health Link		Suburban	1	FHT	70,054	48	593 (0.85)
LHIN 4: HNIB							
Brant Six Nations Health Link		Urban	4	Hosp.	126,101	46	1148 (0.91)
Burlington Health Link		Urban	1	CCAC	213,983	87	1408 (0.66)
Haldimand Health Link		Suburban	2	Hosp.	46,213	35	426 (0.92)
Hamilton Central Health Link	Yes	Urban	5	FHT	207,840	118	1796 (0.86)
Hamilton East Health Link		Urban	4	Hosp.	162,458	118	1334 (0.82)
Hamilton West Health Link		Urban	1	Hosp.	174,830	83	1380 (0.79)
Niagara North East Health Link		Urban	3	CCAC	196,242	202	1750 (0.89)
Niagara North West Health Link		Suburban	1	Hosp.	64,671	47	515 (0.8)
Niagara South East Health Link		Urban	4	Hosp.	106,527	73	1039 (0.98)
Niagara South West Health Link		Urban	4	CHC	82,267	75	862 (1.05)
Norfolk Health Link		Suburban	4	Hosp.	69,056	50	660 (0.96)
LHIN 5: Central West							
Bolton-Caledon Health Link		Urban	1	Hosp.	44,432	<30	206 (0.46)
Bramalea and Area Health Link		Urban	2	Hosp.	225,335	55	753 (0.33)
Brampton and Area Health Link		Urban	2	Hosp.	292,085	82	1122 (0.38)
Dufferin and Area Health Link	Yes	Suburban	1	Hosp.	58,854	37	368 (0.63)
North Etobicoke-Malton-West Woodbridge HL	Yes	Urban	5	CCAC	259,642	99	1132 (0.44)
LHIN 6: Mississauga Halton							
East Mississauga Health Link	Yes	Urban	2	FHT	446,406	221	1799 (0.4)
Halton Hills Health Link		Urban	1	FHT	70,664	40	432 (0.61)
South Etobicoke Health Link		Urban	2	CHC	123,334	70	853 (0.69)
South West Mississauga Health		Urban	2	CCAC	168,416	88	781 (0.46)
LHIN 7: Toronto Central							
Central West Toronto Health Link		Urban	5	Other	80,276	74	466 (0.58)
Don Valley Greenwood Health Link	Yes	Urban	5	Other	157,896	81	844 (0.54)
East Toronto Health Link	Yes	Urban	5	FHT	177,959	117	1305 (0.73)
Mid East Toronto Health Link	Yes	Urban	3	CHC	148,682	62	682 (0.46)
Mid West Toronto Health Link	Yes	Urban	2	FHT	484,783	294	2388 (0.49)
North East Toronto Health Link		Urban	2	Hosp.	188,498	76	1183 (0.63)
North West Toronto Health Link		Urban	1	Hosp.	139,528	70	887 (0.64)
South Toronto Health Link		Urban	4	Hosp.	168,726	117	1284 (0.76)
West Toronto Health Link		Urban	4	CCAC	82,790	39	643 (0.78)

Table 2: List of 67 Health Links included in analyses and select characteristics, continued.

Health Link Name	Early Adopter (n=22)	Rurality	Material Deprivation Quintile	Lead Org. Type	Total No. Assigned to HL	No. Palliative Discharges	No. Decedents (% of Total No. Assigned)
LHIN 8: Central							
North York Central Health Link	Yes	Urban	2	Hosp.	608,758	280	3087 (0.51)
South Simcoe and Northern York Region HL	Yes	Suburban	1	Hosp.	278,739	168	1733 (0.62)
Southwest York Region Health Link		Urban	1	Hosp.	543,492	203	2091 (0.39)
LHIN 9: Central East							
Durham North East Health Link		Urban	3	CCAC	337,605	260	2395 (0.71)
Peterborough Health Link	Yes	Suburban	4	CCAC	152,711	227	1456 (0.95)
LHIN 10: South East							
Kingston Health Link	Yes	Urban	3	FHT	171,129	110	1332 (0.78)
Quinte Health Link	Yes	Suburban	4	CHC	139,534	188	1419 (1.02)
Rideau Tay Health Link		Suburban	4	CHC	51,881	76	569 (1.1)
Rural Hastings Health Link	Yes	Rural	5	CHC	42,163	65	457 (1.08)
Rural Kingston Health Link	Yes	Suburban	3	CHC	19,516	33	211 (1.08)
Salmon River Health Link		Suburban	3	CHC	20,712	<30	217 (1.05)
Thousand Islands Health Link	Yes	Suburban	3	FHT	78,498	104	831 (1.06)
LHIN 11: Champlain							
Arnprior Region and Ottawa West Health Link		Urban	1	Hosp.	190,963	131	999 (0.52)
North Renfrew County Health Link		Rural	3	FHT	54,718	<30	454 (0.83)
Prescott-Russell Regional Health		Rural	5	CCAC	53,916	40	506 (0.94)
South Renfrew Health Link		Rural	4	Hosp.	24,078	32	257 (1.07)
Stormont, Glengarry, Cornwall and Akwesasne HL		Suburban	5	Hosp.	100,395	65	954 (0.95)
Upper Canada Health Link		Suburban	1	Hosp.	75,226	43	474 (0.63)
LHIN 12: North Simcoe Muskoka							
Barrie Community Health Link	Yes	Urban	2	FHT	196,094	132	1313 (0.67)
Couchiching Health Link		Suburban	3	FHT	64,350	43	668 (1.04)
Muskoka Community Health Link		Rural	2	Other	63,773	<30	616 (0.97)
North Simcoe Collaborative Health		Rural	4	CHC	49,537	<30	500 (1.01)
South Georgian Bay Community	Yes	Suburban	3	FHT	62,204	67	600 (0.97)
LHIN 13: North East							
Cochrane North Health Link		Rural	5	CHC	20,936	<30	163 (0.78)
Cochrane South Health Link	Yes	Suburban	5	FHT	66,423	64	618 (0.93)
Sault Ste. Marie Health Link		Suburban	5	Other	91,656	100	887 (0.97)
Temiskaming Health Link	Yes	Rural	5	CHC	33,597	<30	375 (1.12)
LHIN 14: North West							
City of Thunder Bay Health Link		Urban	4	CCAC	140,512	277	1259 (0.9)
District of Thunder Bay Health Link		Rural	5	Hosp.	17,847	<30	140 (0.78)
Not Assigned to a Health Link					3,597,495	2,234	23,275 (0.65)

Palliative Care Indicators

A total of 8,590 palliative discharges among 7,357 patients were identified in fiscal year 2012. Of these discharges, 6,356 (74.0%) were among patients assigned to one of the 67 HLs. Mean age of all palliative patients was 68 years (standard deviation, SD = 17) and 50.1% were women. These characteristics were comparable across HL rurality. 86.8% of patients assigned to an urban HL also resided in an urban residential area, 71.5% of patients assigned to a suburban HL also resided in a suburban area, and 77.1% of patients assigned to a rural HL also resided in a rural area. In each of urban, suburban and rural HLs, the proportion of palliative patients residing in the lowest (neighbourhood-level) income quintile was greater than expected (>20%) quite likely because older adults near the end of life have lower incomes. In rural HLs, a higher proportion of individuals were enrolled with a Family Health Team compared to individuals in urban and suburban HLs.

Table 3: Characteristics of the palliative cohort, by rurality and by assignment to a Health Link

PALLIATIVE COHORT	Health Link Rurality			Assigned to a Health Link		TOTAL
	Rural	Suburban	Urban	Assigned to a Health Link	Not in a Health Link	
Total Population (N)	419	1,446	4,491	6,356	2,234	8,590
Sex (% Male)	51.6	50.7	51.6	51.4	45.7	49.9
Mean Age (years ± SD*)	67.5 ± 16.3	68.9 ± 14.7	68.7 ± 16.2	68.7 ± 15.9	68.6 ±	68.4 ± 16.5
Rurality (Home Residence, %)						
Rural	77.1	13.3	1.6	9.3	8.6	9.1
Suburban	16.7	71.5	11.2	25.3	19.8	23.8
Urban	3.1	12.8	86.8	64.4	69.7	65.8
(Neighbourhood) Income Quintile						
1 = lowest	26.3	22.5	21.1	21.8	20.0	21.3
2	20.8	20.1	20.7	20.6	21.5	20.8
3	22.2	19.2	19.4	19.6	18.0	19.2
4	15.0	22.7	19.9	20.2	20.4	20.3
5 = highest	14.8	14.7	18.6	17.4	19.9	18.1
Material Deprivation Quintile*(%)						
1 = least	11.0	15.3	23.0	20.5	25.0	21.7
2	22.2	23.0	20.7	21.3	21.0	21.2
3	28.6	22.1	22.4	22.8	19.2	21.9
4	19.6	18.9	17.7	18.1	17.8	18.0
5 = most	15.5	18.3	15.1	15.8	15.0	15.6
Primary Care Model (%)						
FHG	13.4	10.0	29.8	24.2	27.0	24.9
FHO or FHN	11.5	31.1	25.0	25.5	28.2	26.2
FHT	53.0	33.7	19.1	24.6	19.7	23.4
Non	18.1	17.4	22.8	21.2	21.4	21.3
Other	4.1	7.8	3.4	4.4	3.6	4.2

*missing values present for some individuals

Table 4 presents the summary of palliative care indicator values across the 67 HLs. Here, the distribution of estimates are sorted and grouped by decile, and highlight the range in estimates including high performing HLs (decile 1, top 10%) as well as lowest performing HLs (decile 10, bottom 10%). Further details of the full distribution of indicator estimates are in Appendices 6 and 7.

Table 4: Summary of palliative care indicator values: highest and lowest performance

Decile of Performance (HL)	Home support for palliative patients (%)	ED visits within 30 days for discharged palliative patients (%)	Palliative hospital readmission rate (%)
Decile 1: Highest Performers	81.3 to 90.0	17.3 to 25.6	18.5 to 21.3
Decile 10: Lowest Performers	25.0 to 52.1	46.0 to 54.2	37.7 to 41.9

Note: Values represent the range (minimum to maximum) for each decile

Palliative indicator estimates for each of the 67 HLs, grouped by local health integration network (LHIN), are presented in Table 5. Results tables stratified by rurality, material deprivation and lead organization type can be found in Appendices 3 – 5, respectively.

Key Findings of Palliative Care Indicators:

1. ***Home support for discharged palliative patients***
   - Across HLs, a large variability in indicator estimates was observed: values for the highest performing HLs (top decile) ranged from 81.3-90.0% whereas values ranged from 25.0-52.1% among poorest performers (bottom decile). Overall, this represents a 3.6-fold difference between the highest and lowest performance. (Table 4)
   - On average, 68.0% of Ontarians identified as palliative in hospital and discharged home in 2012 received publically funded, palliative home care support from a Community Care Access Center within 90 days of discharge. (Table 5)
   - Waterloo Wellington, Mississauga Halton, Champlain and North Simcoe Muskoka LHINs showed the strongest trends with more high than low-performing HLs with home support after discharge. (Table 5)
   - Urban HLs (mean estimate = 69.9%) were better performers compared to rural and suburban HLs (63.0% and 63.6%, respectively). (Table A3)
   - Compared to other lead organization categories, HLs led by CHCs had the lowest average values (58.4%). (Table A5)

2. ***The proportion of patients identified as palliative in hospital that are discharged to home with an emergency department (ED) visit within 30 days of discharge***
   - Estimates among top 10% performing HLs ranged from 17.3-25.6%, compared to 46.0-54.2% for poorest performing HLs, more than a 3-fold difference between highest and lowest performers. (Table 4)
   - On average, 36.3% of Ontarians identified as palliative in hospital in 2012 had one or more emergency department visits within 30 days of being discharged from hospital. (Table 5)

- Waterloo Wellington, Hamilton Niagara Haldimand Brant, Missisauga Halton, and North Simcoe Muskoka LHINs showed the strongest trends with more high than low-performing HLs with fewer ED visits following a palliative discharge. (Table 5)
- Rural HLs (average = 41.8%) were worse performers compared to urban and suburban HLs (35.6% and 36.9%, respectively). (Table A3)
- The lowest average values across lead organization categories were observed for FHTs (35.1%), Hospitals (35.1%), and CHCs (35.6%). (Table A5)

3. Palliative hospital readmission rate

- Estimates for the highest performing HLs ranged from 18.5-21.3% compared to 37.7-41.9% for HLs in the lowest decile, more than a 2-fold difference between highest and lowest performing HLs. (Table 4)
- On average, 30.3% of Ontarians identified as palliative in hospital in 2012 had one or more acute care admissions within 30 days of being discharged from hospital. (Table 5)
- Waterloo Wellington and Hamilton Niagara Haldimand Brant LHINs showed the strongest trends with more high than low-performing HLs with fewer hospital readmissions following a palliative discharge. (Table 5)
- Compared to the other 2 palliative indicators, less variability was observed by rurality for hospital readmissions: values for urban, suburban and rural HLs were comparable at 30.2%, 29.9%, and 32.5% respectively. (Table A3)
- Compared to other lead organization categories, HLs led by CCACs had the highest average values (35.4%). (Table A5)

Palliative Care Indicators: Other Highlights

- In general, many HLs with significantly lower (worse) values for home support after palliative discharge also had either a higher (worse) than average value for ED visits after discharge, or for hospital readmissions.
- In general, for each palliative indicator, material deprivation quintile at the HL-level was not associated with being a better or worse performer. (Table A4)
- For ED visits and readmissions within 30 days of discharge indicators, no HL lead organization category was systematically associated with being a better or worse performer, relative to other groups. (Table A5)
- For each palliative indicator, indicator estimates among Ontarians not assigned to a HL were similar to that of provincial averages. (Table 5).

Table 5: Performance of 67 Health Links for 3 indicators of palliative care, sorted by LHIN

HEALTH LINK (**= early adopter)	Home support for palliative patients			Proportion of palliative patients discharged home with an ED visit within 30 days			Palliative hospital readmission rate		
Cohort (Palliative/End-of-Life) Average	68.0			36.3			30.3		
NOT ASSIGNED TO A HL	67.4			34.4			28.1		
LHIN 1: Erie St. Clair									
Chatham Kent	60.6			42.4			21.2	*	
LHIN 2: South West									
Huron-Perth County**	64.5			46.1	*		38.2	*	
London-Middlesex County	78.0		†	26.7		†	27.6		
North Grey Bruce	52.9			26.5			20.6	*	
South Grey Bruce	43.8	*	†	54.2	*	†	33.3		
LHIN3 : Waterloo Wellington									
Cambridge	79.0		†	17.3	*	†	18.5	*	†
Guelph**	78.2		†	33.3			29.5		
Kitchener-Waterloo	80.5		†	28.5		†	22.2		†
Rural Wellington	75.0			41.7			25.0		
LHIN 4: HNIB									
Brant Six Nations	69.6			26.1			19.6	*	
Burlington	64.4			35.6			23.0		
Haldimand	68.6			37.1			22.9		
Hamilton Central**	67.8			36.4			28.8		
Hamilton East	71.2			28.8			22.0		
Hamilton West	63.9			25.3	*	†	22.9		
Niagara North East	70.8			43.1			34.7		
Niagara North West	80.9		†	46.8	*		25.5		
Niagara South East	67.1			35.6			23.3		
Niagara South West	56.0			28.0			21.3	*	
Norfolk	44.0	*	†	32.0			20.0	*	
LHIN 5: Central West									
Bolton-Caledon	.			.			.		
Bramalea and Area	67.3			27.3			25.5		
Brampton and Area	70.7			31.7			35.4		
Dufferin and Area**	64.9			35.1			29.7		
North Etobicoke-Malton-West Woodbridge**	75.8			44.4			41.4	*	†
LHIN 6: Mississauga Halton									
East Mississauga**	81.0		†	36.7			32.6		
Halton Hills	90.0	*	†	32.5			27.5		
South Etobicoke	72.9			22.9	*	†	21.4		
South West Mississauga	81.8	*	†	29.5			28.4		
LHIN 7: Toronto Central									
Central West Toronto	67.6			45.9			41.9	*	
Don Valley/Greenwood**	67.9			45.7			37.0		
East Toronto**	57.3		†	36.8			29.1		
Mid East Toronto**	66.1			27.4			24.2		
Mid-West Toronto**	73.8			39.8			34.4		
North East Toronto	73.7			23.7	*	†	32.9		
North West Toronto	52.9		†	25.7			28.6		
South Toronto	73.5			30.8			28.2		
West Toronto	69.2			35.9			28.2		

Note: * = denotes highest (green) and lowest (red) performance, as deciles; † = statistically different (better = green shades, worse = red shades) than provincial average (p<0.05);

Table 5 continued: Performance of 67 Health Links for 3 indicators of palliative care, sorted by LHIN (continued)

HEALTH LINK (**= early adopter)	Home support for palliative patients			Proportion of palliative patients discharged home with an ED visit within 30 days			Palliative hospital readmission rate		
Cohort (Palliative/End-of-Life) Average	68.0			36.3			30.3		
LHIN 8: Central									
North York Central**	67.1			37.1			33.6		
South Simcoe and Northern York Region**	53.0		†	45.8		†	32.7		
South West York Region	58.6		†	42.9			38.4	*	†
LHIN 9: Central East									
Durham North East	71.2			39.6			32.3		
Peterborough**	87.7	*	†	26.4		†	40.1	*	†
LHIN 10: South East									
Kingston**	49.1	*	†	39.1			26.4		
Quinte**	53.7		†	38.3			31.9		
Rideau Tay	42.1	*	†	48.7	*	†	32.9		
Rural Hastings**	56.9			36.9			27.7		
Rural Kingston**	42.4	*	†	30.3			24.2		
Salmon River	.			.			.		
Thousand Islands**	25.0	*	†	37.5			26.0		
LHIN 11: Champlain									
Arnprior Region and Ottawa West	59.5			45.8		†	30.5		
North Renfrew County	.			.			.		
Prescott-Russell Regional	85.0	*	†	45.0			37.5		
South Renfrew	65.6			25.0	*		31.3		
Stormont, Glengarry, Cornwall and Akwesasne	75.4			26.2			21.5		
Upper Canada	69.8			32.6			25.6		
LHIN 12: North Simcoe Muskoka									
Barrie Community**	78.8		†	32.6			22.0		
Couchiching	83.7	*	†	25.6	*		.		
Muskoka Community	.			.			.		
North Simcoe Collaborative	.			.			.		
South Georgian Bay Community**	79.1		†	37.3			31.3		
LHIN 13: North East									
Cochrane North	.			.			.		
Cochrane South/Timmins**	59.4			46.9	*		34.4		
Sault Ste. Marie	83.0	*	†	37.0			28.0		
Temiskaming**	.			.			.		
LHIN 14: North West									
City of Thunder Bay	59.2		†	49.1	*	†	39.7	*	†
District of Thunder Bay	.			.			.		

Note: * = denotes highest (green) and lowest (red) performance, as deciles; † = statistically different (better = green shades, worse = red shades) than provincial average (p<0.05);

End-of-life Care Indicators

A total of 91,130 decedents were identified in 2012, of which 67,855 (74.5%) were assigned to one of the 67 HLs. Mean age of all decedents in 2012 was 76 years (SD = 15) and 50.1% were women. Age and sex were comparable across HL rurality. 62.5% of decedents assigned to an urban HL also resided in an urban residential area, 69.7% of decedents assigned to a suburban HL also resided in a suburban area and 73.7% of decedents assigned to a rural HL also resided in a rural area. In each of urban, suburban and rural HLs, the proportion of decedents in the lowest (neighbourhood-level) income quintile was greater than expected (>20%).

Table 6: Characteristics of the end-of-life cohort, by rurality and by assignment to a Health Link

END-OF-LIFE COHORT	Health Link Rurality			Assigned to a Health Link		TOTAL
	Rural	Suburban	Urban	Assigned to a Health Link	Not in a Health Link	
Total Population (N)	6,214	13,757	23,275	67,855	23,275	91,130
Sex (% Male)	50.5	50.1	50.2	49.8	50.2	49.9
Mean Age (years ± SD*)	76.2 ± 14.9	76.1 ± 15.0	75.9 ± 15.4	75.9 ± 15.4	75.9 ± 15.4	75.9 ± 15.4
Rurality (Home Residence, %)						
Rural	73.7	13.9	9.8	10.6	9.8	10.4
Suburban	21.1	69.7	26.1	23.4	26.1	24.1
Urban	2.9	15.0	62.5	65.3	62.5	64.6
(Neighbourhood) Income Quintile						
1 = lowest	25.1	21.3	22.2	22.8	22.2	22.6
2	22.1	19.8	21.4	20.8	21.4	20.9
3	19.6	21.0	19.1	19.5	19.1	19.4
4	15.9	20.9	19.9	18.6	19.9	18.9
5 = highest	16.8	16.4	17.1	17.9	17.1	17.7
Material Deprivation Quintile* (%)						
1 = least	10.8	16.4	20.9	20.8	20.9	20.8
2	20.9	22.5	20.5	21.4	20.5	21.2
3	25.4	21.2	19.7	21.4	19.7	20.9
4	25.1	19.0	19.4	18.1	19.4	18.4
5 = most	15.9	19.2	17.3	16.6	17.3	16.8
Primary Care Model (%)						
FHG	10	12	23.5	22.3	23.5	22.6
FHO or FHN	13.1	31.1	26.7	25.8	26.7	26
FHT	49.8	31.1	21.5	24.4	21.5	23.7
Non	23.8	19.3	24.5	23.6	24.5	23.8
Other	3.3	6.5	3.8	3.9	3.8	3.9

*missing data present for some individuals

Table 7 presents the summary of end-of-life care indicator values across the 67 HLs. The distribution of estimates is grouped by decile, and highlights the range in values including high performing HLs (decile 1, top 10%) as well as lowest performing HLs (decile 10, bottom 10%). Further details of the full distribution of indicator estimates for end-of-life care indicators are presented in Appendices 6 and 7.

Table 7: Summary of end-of-life care indicator values: highest and lowest performance

Decile of Performance (HL)	Unscheduled ED visits in the last 2 weeks preceding death (%)	Total cost at the end of life (mean $)	Proportion of deaths in hospital (%)	(Mean) Days in hospital at the end of life
Decile 1: Highest Performers	32.5 to 37.0	42,605 to 45,713	35.2 to 39.9	5.3 to 6.5
Decile 10: Lowest Performers	44.0 to 47.6	59,162 to 62,676	58.6 to 62.6	10.2 to 12.0

Indicator estimates for each of the 67 HLs, grouped by LHIN, are presented in Table 8. Results tables stratified by rurality, material deprivation and lead organization type can be found in Appendices 3 – 5, respectively.

Key Findings of End-of-life Indicators:

4. Emergency department (ED) visits in the last two weeks preceding death

- Values for the highest performing HLs (top 10%) ranged from 32.5-37.0%, compared to 44.0-47.6% for lowest performing HLs (bottom 10%). (Table 7)
- Among all decedents in 2012, an average of 40.1% had one or more ED visits in the last 2 weeks of life. (Table 8)
- Mississauga Halton and Toronto Central LHINs showed the strongest trends with more high than low-performing HLs with fewer ED visits in the last two weeks preceding death. (Table 8)
- Estimates were comparable when averaged across urban (mean value = 39.4%), suburban (42.1%) and rural (41.3%) HL categories (Table A3), as well as across lead organization categories (Table A5).
- In general, worse performance for this indicator was observed with higher levels of material deprivation at the HL level. (Table A4)

5. Total cost at the end of life

- Mean costs in the last year of life ranged from $42,605-45,713 among HLs in the best performing decile, versus a range of $59,162-62,676 among low performing HLs (bottom 10%), more than a 40% increase comparing lowest to highest performing HLs. (Table 7)
- The mean cost of decedents in 2012 in the last year of life was $53,306. (Table 8)
- South West, Waterloo Wellington, South East, Champlain and North Simcoe Muskoka LHINs showed the strongest trends with more high than low-performing HLs the lowest total cost in the last year of life. (Table 8)
- Average cost was higher (worse performer) among urban HLs (mean costs = $55,200) compared to suburban ($49,724) and rural ($46,645) HLs. (Table A3)

- Across HLs grouped by material deprivation, the highest costs (worse performer) were HLs in the most deprived quintile (quintile 5, mean $55,146), although costs did not decrease incrementally with lower levels of material deprivation. (Table A4).
- Average cost was lowest among CHC-led HLs ($49,680), relative to other groups. (Table A5)

6. Proportion of deaths in hospital

- Indicator values ranged from 35.2-39.9% among high performing HLs (top 10%), compared to 58.6-62.6% in lower performing HLs (Q5). (Table 7)
- On average, 51.5% of Ontario decedents in 2012 died in hospital. (Table 8)
- South West, Waterloo Wellington, South East, Champlain and North Simcoe Muskoka LHINs showed the strongest trends with more high than low-performing HLs with deaths in hospital settings. (Table 8)
- Minor differences were observed by HL rurality: The proportion of deaths in hospital was slightly greater among decedents affiliated with urban HLs (mean = 52.8%) compared with decedents in either suburban (48.0%) or rural (46.3%) HLs. (Table A3)
- The proportion of deaths in hospital was lowest among decedents affiliated with HLs in the least deprived quintile (quintile 1, highest performers). Indicator estimates were highest (poorest performers) in the most deprived quintile (quintile 5, 53.8%). (Table A4)
- Performance did not vary systematically by lead organization categories. (Table A5)

7. Days in hospital at the end of life

- Indicator estimates ranges from 5.3 days to 12.0 day across HLs, a 2.3-fold difference. (Table 7)
- The average number of days in hospital during the last 30 days of life among decedents in 2012 was 8.6 (median = 3 days). (Table 8)
- South West, Waterloo Wellington, Central West, South East, Champlain and North Simcoe Muskoka LHINs showed the strongest trends with more high than low-performing HLs with considering days in hospital settings in the final 30 days of life. (Table 8)
- Decedents affiliated with urban HLs spent more time (poorer performers), on average, in hospital in the last 30 days of life (mean estimate = 9.0 days) compared to decedents affiliated with suburban HLs (7.8 days) or with rural HLs (7.4 days). (Table A3)
- Decedents affiliated with the most deprived HLs spend more time (poorer performers), on average, in hospital in the last 30 days (9.3 days) compared to decedents affiliated with less deprived HLs. (Table A4)
- Performance did not vary systematically by lead organization categories. (Table A5)

End-of-life Care Indicators: Other highlights

- For each end-of-life indicator, indicator estimates among Ontarians not assigned to a HL were similar to that of provincial averages.
- Although most HLs performed better than average on some palliative indicators, but below average on others, pockets of high (and low) performance – where one HL is consistently above (or below) average across all 4 end-of-life indicators – are evident.

Table 8: Performance of 67 Health Links for 4 indicators of end-of-life care, sorted by LHIN

HEALTH LINK (**= early adopter)	Unscheduled ED visits in the last 2 weeks preceding death			Total cost at the end of life			Proportion of deaths in hospital			Days in hospital at the end of life		
Cohort (Palliative/End-of-Life) Average	40.1			53,306			51.5			8.6		
NOT ASSIGNED TO A HL	40.6			52,428			50.8			8.5		
LHIN 1: Erie St. Clair												
Chatham Kent	40.3			50,606			47.7			7.3		†
LHIN 2: South West												
Huron-Perth County**	37.7			45,465		†	45.8		†	6.9		†
London-Middlesex County	38.3		†	53,198			53.1			8.7		
North Grey Bruce	41.6			42,605	*	†	43.7		†	6.1	*	†
South Grey Bruce	45.8	*	†	45,119	*	†	48.6			6.6		†
LHIN 3: Waterloo Wellington												
Cambridge	39.6			46,912		†	44.1		†	6.8		†
Guelph**	43.4			47,729		†	38.1	*	†	7.3		†
Kitchener-Waterloo	36.8	*	†	48,518		†	46.8		†	7.4		†
Rural Wellington	37.4			42,935	*	†	35.2	*	†	5.3	*	†
LHIN 4: HNIB												
Brant Six Nations	40.2			46,013		†	44.7		†	7.0		†
Burlington	34.0	*	†	52,544			43.8		†	7.7		†
Haldimand	44.1	*		47,719		†	56.3			9.0		
Hamilton Central**	40.9			58,821		†	52.8			9.6		†
Hamilton East	36.3	*	†	57,327		†	50.2			8.9		
Hamilton West	32.5	*	†	56,524		†	44.4		†	8.0		
Niagara North East	41.7			51,546			52.7			8.6		
Niagara North West	40.4			46,572		†	39.8	*	†	6.6	*	†
Niagara South East	38.3			49,181		†	53.7			8.7		
Niagara South West	42.3			47,483		†	53.8			8.6		
Norfolk	41.2			46,101		†	51.5			8.0		
LHIN 5: Central West												
Bolton-Caledon	38.4			45,228	*	†	44.7			7.2		
Bramalea and Area	41.4			52,808			51.9			8.4		
Brampton and Area	43.0			51,794			52.7			8.0		
Dufferin and Area**	44.0			51,150			55.4			7.9		
North Etobicoke-Malton-West Woodbridge**	42.0			58,563		†	58.9		†	10.0		†
LHIN 6: Mississauga Halton												
East Mississauga**	37.9			59,049		†	56.0		†	9.9		†
Halton Hills	40.0			52,868			52.5			8.9		
South Etobicoke	40.3			59,690	*	†	58.0		†	10.5	*	†
South West Mississauga	38.3			58,841		†	53.1			8.7		
LHIN 7: Toronto Central												
Central West Toronto	41.2			57,389			62.2	*	†	11.2	*	†
Don Valley/Greenwood**	41.5			62,179	*	†	62.1	*	†	11.1	*	†
East Toronto**	44.1		†	54,620			60.5	*	†	10.1		†
Mid East Toronto**	36.4	*		55,493			54.8			10.2		†
Mid-West Toronto**	38.7			62,676	*	†	56.7		†	9.9		†
North East Toronto	37.7			59,854	*	†	55.8		†	10.0		†
North West Toronto	35.6	*	†	58,459		†	53.3			9.3		
South Toronto	36.9		†	59,885	*	†	56.5		†	10.5	*	†
West Toronto	38.6			59,275		†	54.9			10.0		†

Note: * = denotes highest (green) and lowest (red) performance, as deciles; † = statistically different (better = green shades, worse = red shades) than provincial average ($p<0.05$);

Table 8 continued: Performance of 67 Health Links for 4 indicators of end-of-life care, sorted by LHIN (continued)

HEALTH LINK (**= early adopter)	Unscheduled ED visits in the last 2 weeks preceding death			Total cost at the end of life			Proportion of deaths in hospital			Days in hospital at the end of life		
Cohort (Palliative/End-of-Life) Average	40.1			53,306			51.5			8.6		
LHIN 8: Central												
North York Central**	41.3			56,276		†	58.2		†	9.7		†
South Simcoe and Northern York Region**	41.6			52,541			49.4			8.2		
South West York Region	43.4		†	58,519		†	60.2	*	†	10.0		†
LHIN 9: Central East												
Durham North East	41.3			54,816			55.1		†	9.1		†
Peterborough**	39.2			51,972			58.4		†	9.3		†
LHIN 10: South East												
Kingston**	37.2		†	53,778			49.9			8.6		
Quinte**	42.7			46,016		†	45.7		†	6.7		†
Rideau Tay	46.7	*	†	52,361			52.7			8.3		
Rural Hastings**	41.4			45,275	*	†	44.6		†	7.1		†
Rural Kingston**	37.9			45,962			40.8	*	†	6.5	*	†
Salmon River	41.9			47,595			43.8		†	6.1	*	†
Thousand Islands**	43.2			49,754			54.2			8.2		
LHIN 11: Champlain												
Arnprior Region and Ottawa West	37.5			56,105			40.3	*	†	7.0		†
North Renfrew County	39.6			47,583		†	53.3			9.0		
Prescott-Russell Regional	47.0	*	†	47,821		†	49.8			7.5		†
South Renfrew	37.4			46,424		†	37.4	*	†	6.4	*	†
Stormont, Glengarry, Cornwall and Akwesasne	44.5	*	†	53,758			44.3		†	8.2		
Upper Canada	42.8			50,454			45.8		†	7.6		†
LHIN 12: North Simcoe Muskoka												
Barrie Community**	37.9			51,328			42.7		†	7.3		†
Couchiching	43.7			48,168		†	46.7		†	6.8		†
Muskoka Community	40.9			47,000		†	43.2		†	6.7		†
North Simcoe Collaborative	42.6			47,547		†	50.4			7.8		
South Georgian Bay Community**	42.2			45,326	*	†	47.2			7.5		†
LHIN 13: North East												
Cochrane North	39.9			56,220			62.6	*	†	12.0	*	†
Cochrane South/Timmins**	47.6	*	†	50,369			54.4			8.9		
Sault Ste. Marie	40.6			54,008			44.8		†	8.2		
Temiskaming**	42.7			52,359			54.7			9.4		
LHIN 14: North West												
City of Thunder Bay	41.9			61,175	*	†	58.2		†	10.3		†
District of Thunder Bay	42.1			56,134			59.3	*		11.5	*	†

Note: * = denotes highest (green) and lowest (red) performance, as deciles; † = statistically different (better = green shades, worse = red shades) than provincial average (p<0.05);

Conclusions

This report describes the baseline performance of HLs on measurable indicators of palliative care and end-of-life care using health administrative data. Previous HSPRN work has shown that the end-of-life population in Ontario constitutes less than 1% of the province's population, but consumed $4.7 billion dollars annually between 2010 and 2013, or approximately 10% of the Ontario's total health care budget (Tanuseputro et al., 2015). This population is thus an important target population for HLs that aim to target complex and high cost individuals. Findings from this report reveal that HLs are beginning their integration and coordination efforts for palliative and end-of-life populations at different levels of performance. Some HLs are beginning their process as high performers, consistently scoring better than provincial average for indicators for palliative care, end-of-life care, or in some cases, both. Other HLs appear to be starting their initiatives with more opportunities for improvement when their baseline performance is compared to provincial averages, or to other like-HLs.

For most indicators examined in this report, substantial variation in performance was observed across the 67 HLs. We found that much of the variation in HL performance appeared at the LHIN rather than at the HL level suggesting that opportunities to improve palliative care should be undertaken across entire LHINs. This highlights considerable potential for improvement by focusing on coordinating and integrating care for individuals in areas of the province with lower levels of performance. Improvement efforts for end-of-life and palliative care can be supported at all levels: from individual health care practitioners, to primary care groups, to HLs, to LHINS, and to provincial initiatives.

Consistent with our previous reporting on HL performance, one striking finding of this work is that HLs in areas with the highest levels of material deprivation performed worse than provincial averages for some indicators, particularly with regards to end-of-life care. HLs are operating in different community context and this finding emphasizes the need for each unit to address issues such as housing, food-security, education, unemployment and social support systems, and issues of health care access in an effort to improve outcomes. Some HLs have begun to include organizations that provide social assistance in their discussions on how to integrate and coordinate care for their targeted populations.

Analyses also revealed that while urban HLs tended to score well on palliative indicators, they were often poor performers (worse off than provincial averages) for end-of-life care, including total costs in the last year of life, institutional deaths, and hospital at the end of life. It should be noted that these three end-of-of-life exploratory indicators are "big-dot" indicators that require efforts from multiple health care sectors, and have influences – such as patient and family preferences – that may go beyond the control of the HL. Nevertheless, the high levels and large variation on indicators such institutional deaths across HL's and LHINs suggest that they are amenable to intervention. At the LHIN-level, Champlain LHIN, for example, performs best on the proportion of the population dying at home. Champlain residents are twice more likely to die at home than those in the worst performing LHIN, adjusted for patient factors such as age, sex, and comorbidity (Tanuseputro et al., *forthcoming)*. Champlain is also one of the LHINs that have an established palliative care program.

Marked differences by rurality may be reflective of provision of and access to health care services in urban areas compared to rural areas. These differences also highlight important contextual factors for HL leaders and decision makers to consider when deciding how to group HLs with appropriate peer-comparators for future assessments of the HLs.

Future evaluations can use the results included in this report as a benchmark to compare individual HLs over time and identify when improvements are occurring as a result of HL best practices. However, identifying the specific effect of HLs on improving patient outcomes, improving population health, and reducing system costs, requires being able to identify which individuals are enrolled in HL programs. This was not possible at the time of this report. A registry of patients enrolled in the HL program would enable a direct evaluation of the impact of HL activities on the patients that they have enrolled. A registry that allows for linkage with health administrative data would further enable comparisons of enrolled patients to similar patients who are not yet enrolled in HLs as this initiative is implemented across the province. The present report describes the general population trends of patients in HL geographies but does not evaluate the performance of HLs specifically in regard to the patients who are enrolled in HL programs.

The current work evaluated measurable indicators with administrative data, and as such multiple aspects of palliative care and end-of-life care were not considered. Quality of life, the relief of pain, suffering and other symptoms, and the experience of patients and their families are not measureable at the population level using data routinely collected and currently available in administrative datasets. However, HLs must consider these as important indicators moving forward with palliative and end-of-life patients as part of their target populations. Validated tools such as the VOICES survey can be used for this purpose (Hunt, KJ et al. 2014; Seow H. 2014). Second, the palliative care indicators used in this report are limited to patients hospitalized with a palliative care indication, and therefore, the current measures do not capture the broader population of patients in need of palliative care. Finally, this report is based on crude estimates of select indicators. However there is continuing work at HSPRN and through ongoing provincial indicator initiatives (e.g. from Health Quality Ontario and from the Ontario Palliative Care Network) to improve the collection and measurement of palliative and end-of-life indicators for future work.

This report provides a baseline portrait of the characteristics of palliative care patients and decedents in Ontario that fall within the current (67) HL catchment areas, as well as the performance of each HL on 7 measureable indicators. As HLs continue to develop, increase coordination of care, share best practices, and focus on the needs of their respective populations, it is expected that their performance on the indicators used to measure their success will show improvements over time. Knowing which providers to engage and improving approaches to identifying which patients to target for HL interventions will be a key factor in the success of HLs.

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Appendices

A1. Indicator Specifications and Data Sources

Data for this work were derived from a variety of sources. These datasets were linked using unique encoded identifiers and analyzed at the Institute for Clinical Evaluative Sciences (ICES).

The Registered Persons Database (RPDB): provides basic demographic information for Ontarians with a valid Ontario health card number. All residents of the province are eligible, and landed immigrants receive services after a 3-month waiting period. Dates of eligibility for health care coverage are included in the database.

Canadian Institute for Health Information Discharge Abstract Database (CIHI-DAD): provides detailed records of each hospital stay for patients discharged from acute care in Ontario.

Home Care Database (HCD): proves information on services provided by or coordinated by Ontario's Community Care Access Centres (CCACs), including home and long-term care services.

National Ambulatory Care Reporting System (NACRS): provides information on outpatient visits to hospital- and community-based ambulatory care services, including those in emergency departments.

Continuing Care Reporting System (CCRS): provides clinical information on residents receiving continuing care serves, including hospital-based services (complex continuing care) or residential 24-hour care (long-term care). Data are collected using the Resident Assessment Instrument (RAI) instrument.

National Rehabilitation Reporting System (NRS): provides information on client data collected from adult (age 18+) inpatient rehabilitation facilities in Ontario

In addition to these core datasets, the calculation of total costs at the end of life required the additional use of Ontario Drug Benefit Claims (ODB), Same Day Surgery (CIHI-SDS), Ontario Home Care Administrative System (OHCAS), Ontario Health Insurance Plan Claims Database (OHIP), Ontario Mental Health Reporting System (OMHRS), and Assistive Devices Program (ADP) databases. The calculation of each indicator based on these datasets is described in detail below.

INDICATOR NAME: Home support for discharged palliative patients	
Cohort	Palliative Care
Data Source	CIHI-DAD, RPDB, HCD
NUMERATOR	
Calculation	Out of denominator (see below), number of inpatient acute care discharges that are discharged home with support for end-of-life care within 90 days (src_admission = 95, src_discharge = 95, or service_rpc = 95)
DENOMINATOR	
Calculation	Number of home discharges in the last year with a hospital admission that indicates that the patient is palliative. Includes 1) Any diagnosis code with a

	palliative care indication: ICD 10 Code Z51.5 or ICD 9 Code V66.7 or 2) Main patient service of palliative care (PATSERV = 058) and Discharge destination is home (Discharge disposition = 4 (home with support) or 5 (home without support)

INDICATOR NAME: ED visits within 30 days for discharged palliative patients	
Cohort	Palliative Care
Data Source	CIHI-DAD, RPDB, NACRS
NUMERATOR	
Calculation	Out of denominator (see below), number of inpatient acute care discharges that have one or more ED visits within 30 days of hospital discharge, including unscheduled visits only.
DENOMINATOR	
Calculation	Number of home discharges in the last year with a hospital admission that indicates that the patient is palliative. Includes 1) Any diagnosis code with a palliative care indication: ICD 10 Code Z51.5 or ICD 9 Code V66.7 or 2) Main patient service of palliative care (PATSERV = 058) and Discharge destination is home (Discharge disposition = 4 (home with support) or 5 (home without support)

INDICATOR NAME: Palliative hospital readmission rate	
Cohort	Palliative Care
Data Source	CIHI-DAD, RPDB
NUMERATOR	
Calculation	Out of denominator (see below), number of inpatient acute care discharges that are readmitted to acute care within 30 days of hospital discharge. Includes all cause readmission, including emergent or urgent (non-elective) hospital admissions.
DENOMINATOR	
Calculation	Number of home discharges in the last year with a hospital admission that indicates that the patient is palliative. Includes 1) Any diagnosis code with a palliative care indication: ICD 10 Code Z51.5 or ICD 9 Code V66.7 or 2) Main patient service of palliative care (PATSERV = 058) and Discharge destination is home (Discharge disposition = 4 (home with support) or 5 (home without support)

INDICATOR NAME: Unscheduled ED visits in the last 2 weeks preceding death	
Cohort	End-of-life Care
Data Source	RPDB, NACRS
NUMERATOR	
Calculation	Out of denominator (see below), number of decedents with one or more ED visits in the last 2 weeks of life, including unscheduled visits only
DENOMINATOR	
Calculation	Total number of decedents from April 1, 2012 to March 31, 2013

INDICATOR NAME: Total cost at the end of life	
Cohort	End-of-life Care
Data Source	RPDB, CIHI-DAD, CIHI-DSD, NACRS, ODB, NRS, CCRS, HCD, OHCAS, OHIP, OMHRS, ADP
NUMERATOR	
Calculation	Out of denominator (see below), sum of the cost associated with all records of health care use paid for by the Ministry of Health and Long-Term Care (MOHLTC) in the 1-year prior to death. Values are adjusted to 2011 Canadian dollars. Full details of the costing methodology can be found via: Wodchis WP, Bushmeneva K, Nikitovic M, McKillop I. Guidelines on person level cost using administrative databases in Ontario. Toronto: Health System Performance Research Network (HSPRN), 2013.
DENOMINATOR	
Calculation	Total number of decedents from April 1, 2012 to March 31, 2013

INDICATOR NAME: Proportion of deaths in hospital	
Cohort	End-of-life Care
Data Source	CIHI-DAD, CCRS (CCC), NRS
NUMERATOR	
Calculation	Out of denominator (see below), number of decedents that died in hospital, including acute care (dischdisp = “07”), complex continuing care (discharge_to_facility_type = 11), or rehab (dreason = “8”)
DENOMINATOR	

Calculation	Total number of decedents from April 1, 2012 to March 31, 2013

INDICATOR NAME: Days in hospital at the end of life	
Cohort	End-of-life Care
Data Source	CIHI-DAD, CCRS (CCC), NRS, NACRS
NUMERATOR	
Calculation	Out of denominator (see below), (average) number of days in inpatient care in the last 30 days of life. Hospital includes acute care, alternative level of care, complex continuing care, rehab, and emergency care
DENOMINATOR	
Calculation	Total number of decedents from April 1, 2012 to March 31, 2013

For all indicators based on population proportions, all 95% CIs were derived using the traditional binomial approximation method. For indicator values approaching 0 or 100%, however, the Score Method with Continuity Correction was used to prevent possible overshoot.

A2. Health Link Characteristics: Frequencies by Rurality

Characteristic		Rural Health Links	Suburban Health Links	Urban Health Link	All Health Links
	Total (N)	12	19	36	67
Early Adopter					
	Later	9	11	25	45
	Early	3	8	11	22
Material Deprivation Quintile					
	(least deprived) 1	0	5	8	13
	2	2	1	11	14
	3	3	5	5	13
	4	2	4	7	13
	(most deprived) 5	5	4	5	14
Lead Organization Type					
	CCAC	1	1	7	9
	CHC	5	5	4	14
	FHT	2	5	10	17
	Hospital	3	7	13	23
	Other	1	1	2	4

A3. Baseline Health Link Performance: Tables by Rurality

Urban (RIO < 10)			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	69.9	35.6	30.2	39.4	55,200	52.8	9.0
		NOT ASSIGNED	67.4	34.4	28.1	40.6	52,428	50.8	8.5
South West	2	London-Middlesex County	78.0 †	26.7 †	27.6	38.3 †	53,198	53.1	8.7
Waterloo Wellington	3	Cambridge	79.0 †	17.3 * †	18.5 * †	39.6	46,912 †	44.1 †	6.8 †
Waterloo Wellington	3	Guelph**	78.2 †	33.3	29.5	43.4	47,729 †	38.1 * †	7.3 †
Waterloo Wellington	3	Kitchener-Waterloo	80.5 †	28.5 †	22.2 †	36.8 * †	48,518 †	46.8 †	7.4 †
HNHB	4	Brant Six Nations	69.6	26.1	19.6 *	40.2	46,013 †	44.7 †	7.0 †
HNHB	4	Burlington	64.4	35.6	23.0	34.0 * †	52,544	43.8 †	7.7 †
HNHB	4	Hamilton Central**	67.8	36.4	28.8	40.9	58,821 †	52.8	9.6 †
HNHB	4	Hamilton East	71.2	28.8	22.0	36.3 * †	57,327 †	50.2	8.9
HNHB	4	Hamilton West	63.9	25.3 * †	22.9	32.5 * †	56,524 †	44.4 †	8.0
HNHB	4	Niagara North East	70.8	43.1	34.7	41.7	51,546	52.7	8.6
HNHB	4	Niagara South East	67.1	35.6	23.3	38.3	49,181 †	53.7	8.7
HNHB	4	Niagara South West	56.0	28.0	21.3 *	42.3	47,483 †	53.8	8.6
Central West	5	Bolton-Caledon	.	.	.	38.4	45,228 * †	44.7	7.2
Central West	5	Bramalea and Area	67.3	27.3	25.5	41.4	52,808	51.9	8.4
Central West	5	Brampton and Area	70.7	31.7	35.4	43.0	51,794	52.7	8.0
Central West	5	North Etobicoke-Malton-West Woodbridge**	75.8	44.4	41.4 * †	42.0	58,563 †	58.9 †	10.0 †
Mississauga Halton	6	East Mississauga**	81.0 †	36.7	32.6	37.9	59,049 †	56.0 †	9.9 †
Mississauga Halton	6	Halton Hills	90.0 * †	32.5	27.5	40.0	52,868	52.5	8.9
Mississauga Halton	6	South Etobicoke	72.9	22.9 * †	21.4	40.3	59,690 * †	58.0 †	10.5 * †
Mississauga Halton	6	South West Mississauga	81.8 * †	29.5	28.4	38.3	58,841 †	53.1	8.7
Toronto Central	7	Central West Toronto	67.6	45.9	41.9 *	41.2	57,389	62.2 * †	11.2 * †
Toronto Central	7	Don Valley/Greenwood**	67.9	45.7	37.0	41.5	62,179 * †	62.1 * †	11.1 * †
Toronto Central	7	East Toronto**	57.3 †	36.8	29.1	44.1 †	54,620	60.5 * †	10.1 †
Toronto Central	7	Mid East Toronto**	66.1	27.4	24.2	36.4 *	55,493	54.8	10.2 †
Toronto Central	7	Mid-West Toronto**	73.8	39.8	34.4	38.7	62,676 * †	56.7 †	9.9 †
Toronto Central	7	North East Toronto	73.7	23.7 * †	32.9	37.7	59,854 * †	55.8 †	10.0 †
Toronto Central	7	North West Toronto	52.9 †	25.7	28.6	35.6 * †	58,459 †	53.3	9.3
Toronto Central	7	South Toronto	73.5	30.8	28.2	36.9 †	59,885 * †	56.5 †	10.5 * †
Toronto Central	7	West Toronto	69.2	35.9	28.2	38.6	59,275 †	54.9	10.0 †
Central	8	North York Central**	67.1	37.1	33.6	41.3	56,276 †	58.2 †	9.7 †
Central	8	South West York Region	58.6 †	42.9	38.4 * †	43.4 †	58,519 †	60.2 * †	10.0 †
Central East	9	Durham North East	71.2	39.6	32.3	41.3	54,816	55.1 †	9.1 †
South East	10	Kingston**	49.1 * †	39.1	26.4	37.2 †	53,778	49.9	8.6
Champlain	11	Arnprior Region and Ottawa West	59.5	45.8 †	30.5	37.5	56,105	40.3 * †	7.0 †
North Simcoe Muskoka	12	Barrie Community**	78.8 †	32.6	22.0	37.9	51,328	42.7 †	7.3 †
North West	14	City of Thunder Bay	59.2 †	49.1 * †	39.7 * †	41.9	61,175 * †	58.2 †	10.3 †

Suburban (10 ≤ RIO < 40)			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	63.6	36.9	29.9	42.1	49,724	48.8	7.8
Erie St. Clair	1	Chatham Kent	60.6	42.4	21.2 *	40.3	50,606	47.7	7.3 †
Waterloo Wellington	3	Rural Wellington	75.0	41.7	25.0	37.4	42,935 * †	35.2 * †	5.3 * †
HNHB	4	Haldimand	68.6	37.1	22.9	44.1 *	47,719 †	56.3	9.0
HNHB	4	Niagara North West	80.9 †	46.8 *	25.5	40.4	46,572 †	39.8 * †	6.6 * †
HNHB	4	Norfolk	44.0 * †	32.0	20.0 *	41.2	46,101 †	51.5	8.0
Central West	5	Dufferin and Area**	64.9	35.1	29.7	44.0	51,150	55.4	7.9
Central	8	South Simcoe and Northern York Region**	53.0 †	45.8 †	32.7	41.6	52,541	49.4	8.2
Central East	9	Peterborough**	87.7 * †	26.4 †	40.1 * †	39.2	51,972	58.4 †	9.3 †
South East	10	Quinte**	53.7 †	38.3	31.9	42.7	46,016 †	45.7 †	6.7 †
South East	10	Rideau Tay	42.1 * †	48.7 * †	32.9	46.7 * †	52,361	52.7	8.3
South East	10	Rural Kingston**	42.4 * †	30.3	24.2	37.9	45,962	40.8 * †	6.5 * †
South East	10	Salmon River	.	.	.	41.9	47,595	43.8 †	6.1 * †
South East	10	Thousand Islands**	25.0 * †	37.5	26.0	43.2	49,754	54.2	8.2
Champlain	11	Stormont, Glengarry, Cornwall and Akwesasne	75.4	26.2	21.5	44.5 * †	53,758	44.3 †	8.2
Champlain	11	Upper Canada	69.8	32.6	25.6	42.8	50,454	45.8 †	7.6 †
North Simcoe Muskoka	12	Couchiching	83.7 * †	25.6 *	.	43.7	48,168 †	46.7 †	6.8 †
North Simcoe Muskoka	12	South Georgian Bay Community**	79.1 †	37.3	31.3	42.2	45,326 * †	47.2	7.5 †
North East	13	Cochrane South/Timmins**	59.4	46.9 *	34.4	47.6 * †	50,369	54.4	8.9
North East	13	Sault Ste. Marie	83.0 * †	37.0	28.0	40.6	54,008	44.8 †	8.2

Rural (RIO ≥ 40)			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	63.0	41.8	32.5	41.3	46,645	47.6	7.4
South West	2	Huron-Perth County**	64.5	46.1 *	38.2 *	37.7	45,465 †	45.8 †	6.9 †
South West	2	North Grey Bruce	52.9	26.5	20.6 *	41.6	42,605 * †	43.7 †	6.1 * †
South West	2	South Grey Bruce	43.8 * †	54.2 * †	33.3	45.8 * †	45,119 * †	48.6	6.6 †
South East	10	Rural Hastings**	56.9	36.9	27.7	41.4	45,275 * †	44.6 †	7.1 †
Champlain	11	North Renfrew County	.	.	.	39.6	47,583 †	53.3	9.0
Champlain	11	Prescott-Russell Regional	85.0 * †	45.0	37.5	47.0 * †	47,821 †	49.8	7.5 †
Champlain	11	South Renfrew	65.6	25.0 *	31.3	37.4	46,424 †	37.4 * †	6.4 * †
North Simcoe Muskoka	12	Muskoka Community	.	.	.	40.9	47,000 †	43.2 †	6.7 †
North Simcoe Muskoka	12	North Simcoe Collaborative	.	.	.	42.6	47,547 †	50.4	7.8
North East	13	Cochrane North	.	.	.	39.9	56,220	62.6 * †	12.0 * †
North East	13	Temiskaming**	.	.	.	42.7	52,359	54.7	9.4
North West	14	District of Thunder Bay	.	.	.	42.1	56,134	59.3 *	11.5 * †

Deprivation Quintile = 1 = Least Deprived			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	63.8	38.7	30.2	39.1	53,427	47.7	8.1
		NOT ASSIGNED	67.4	34.4	28.1	40.6	52,428	50.8	8.5
Waterloo Wellington	3	Guelph**	78.2 †	33.3	29.5	43.4	47,729 †	38.1 * †	7.3 †
Waterloo Wellington	3	Rural Wellington	75.0	41.7	25.0	37.4	42,935 * †	35.2 * †	5.3 * †
HNHB	4	Burlington	64.4	35.6	23.0	34.0 * †	52,544	43.8 †	7.7 †
HNHB	4	Hamilton West	63.9	25.3 * †	22.9	32.5 * †	56,524 †	44.4 †	8.0
HNHB	4	Niagara North West	80.9 †	46.8 *	25.5	40.4	46,572 †	39.8 * †	6.6 * †
Central West	5	Bolton-Caledon	.	.	.	38.4	45,228 * †	44.7	7.2
Central West	5	Dufferin and Area**	64.9	35.1	29.7	44.0	51,150	55.4	7.9
Mississauga Halton	6	Halton Hills	90.0 * †	32.5	27.5	40.0	52,868	52.5	8.9
Toronto Central	7	North West Toronto	52.9 †	25.7	28.6	35.6 * †	58,459 †	53.3	9.3
Central	8	South Simcoe and Northern York Region**	53.0 †	45.8 †	32.7	41.6	52,541	49.4	8.2
Central	8	South West York Region	58.6 †	42.9	38.4 * †	43.4 †	58,519 †	60.2 * †	10.0 †
Champlain	11	Arnprior Region and Ottawa West	59.5	45.8 †	30.5	37.5	56,105	40.3 * †	7.0 †
Champlain	11	Upper Canada	69.8	32.6	25.6	42.8	50,454	45.8 †	7.6 †

Deprivation Quintile = 2			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	74.7	33.2	28.8	39.6	54,733	52.6	8.8
South West	2	South Grey Bruce	43.8 * †	54.2 * †	33.3	45.8 * †	45,119 * †	48.6	6.6 †
Waterloo Wellington	3	Cambridge	79.0 †	17.3 * †	18.5 * †	39.6	46,912 †	44.1 †	6.8 †
Waterloo Wellington	3	Kitchener-Waterloo	80.5 †	28.5 †	22.2 †	36.8 * †	48,518 †	46.8 †	7.4 †
HNHB	4	Haldimand	68.6	37.1	22.9	44.1 *	47,719 †	56.3	9.0
Central West	5	Bramalea and Area	67.3	27.3	25.5	41.4	52,808	51.9	8.4
Central West	5	Brampton and Area	70.7	31.7	35.4	43.0	51,794	52.7	8.0
Mississauga Halton	6	East Mississauga**	81.0 †	36.7	32.6	37.9	59,049 †	56.0 †	9.9 †
Mississauga Halton	6	South Etobicoke	72.9	22.9 * †	21.4	40.3	59,690 * †	58.0 †	10.5 * †
Mississauga Halton	6	South West Mississauga	81.8 * †	29.5	28.4	38.3	58,841 †	53.1	8.7
Toronto Central	7	Mid-West Toronto**	73.8	39.8	34.4	38.7	62,676 * †	56.7 †	9.9 †
Toronto Central	7	North East Toronto	73.7	23.7 * †	32.9	37.7	59,854 * †	55.8 †	10.0 †
Central	8	North York Central**	67.1	37.1	33.6	41.3	56,276 †	58.2 †	9.7 †
North Simcoe Muskoka	12	Barrie Community**	78.8 †	32.6	22.0	37.9	51,328	42.7 †	7.3 †
North Simcoe Muskoka	12	Muskoka Community	.	.	.	40.9	47,000 †	43.2 †	6.7 †

Deprivation Quintile = 3			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	64.8	36.2	29.4	39.9	51,033	51.2	8.3
South West	2	Huron-Perth County**	64.5	46.1 *	38.2 *	37.7	45,465 †	45.8 †	6.9 †
South West	2	London-Middlesex County	78.0 †	26.7 †	27.6	38.3 †	53,198	53.1	8.7
South West	2	North Grey Bruce	52.9	26.5	20.6 *	41.6	42,605 * †	43.7 †	6.1 * †
HNHB	4	Niagara North East	70.8	43.1	34.7	41.7	51,546	52.7	8.6
Toronto Central	7	Mid East Toronto**	66.1	27.4	24.2	36.4 *	55,493	54.8	10.2 †
Central East	9	Durham North East	71.2	39.6	32.3	41.3	54,816	55.1 †	9.1 †
South East	10	Kingston**	49.1 * †	39.1	26.4	37.2 †	53,778	49.9	8.6
South East	10	Rural Kingston**	42.4 * †	30.3	24.2	37.9	45,962	40.8 * †	6.5 * †
South East	10	Salmon River	.	.	.	41.9	47,595	43.8 †	6.1 * †
South East	10	Thousand Islands**	25.0 * †	37.5	26.0	43.2	49,754	54.2	8.2
Champlain	11	North Renfrew County	.	.	.	39.6	47,583 †	53.3	9.0
North Simcoe Muskoka	12	Couchiching	83.7 * †	25.6 *	.	43.7	48,168 †	46.7 †	6.8 †
North Simcoe Muskoka	12	South Georgian Bay Community**	79.1 †	37.3	31.3	42.2	45,326 * †	47.2	7.5 †

Deprivation Quintile = 4			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	65.5	35.9	31.9	40.1	52,312	52.3	8.7
HNHB	4	Brant Six Nations	69.6	26.1	19.6 *	40.2	46,013 †	44.7 †	7.0 †
HNHB	4	Hamilton East	71.2	28.8	22.0	36.3 * †	57,327 †	50.2	8.9
HNHB	4	Niagara South East	67.1	35.6	23.3	38.3	49,181 †	53.7	8.7
HNHB	4	Niagara South West	56.0	28.0	21.3 *	42.3	47,483 †	53.8	8.6
HNHB	4	Norfolk	44.0 * †	32.0	20.0 *	41.2	46,101 †	51.5	8.0
Toronto Central	7	South Toronto	73.5	30.8	28.2	36.9 †	59,885 * †	56.5 †	10.5 * †
Toronto Central	7	West Toronto	69.2	35.9	28.2	38.6	59,275 †	54.9	10.0 †
Central East	9	Peterborough**	87.7 * †	26.4 †	40.1 * †	39.2	51,972	58.4 †	9.3 †
South East	10	Quinte**	53.7 †	38.3	31.9	42.7	46,016 †	45.7 †	6.7 †
South East	10	Rideau Tay	42.1 * †	48.7 * †	32.9	46.7 * †	52,361	52.7	8.3
Champlain	11	South Renfrew	65.6	25.0 *	31.3	37.4	46,424 †	37.4 * †	6.4 * †
North Simcoe Muskoka	12	North Simcoe Collaborative	.	.	.	42.6	47,547 †	50.4	7.8
North West	14	City of Thunder Bay	59.2 †	49.1 * †	39.7 * †	41.9	61,175 * †	58.2 †	10.3 †

Deprivation Quintile = 5 = Most Deprived			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	68.0	40.5	32.2	42.6	55,146	53.8	9.3
Erie St. Clair	1	Chatham Kent	60.6	42.4	21.2 *	40.3	50,606	47.7	7.3 †
HNHB	4	Hamilton Central**	67.8	36.4	28.8	40.9	58,821 †	52.8	9.6 †
Central West	5	North Etobicoke-Malton-West Woodbridge**	75.8	44.4	41.4 * †	42.0	58,563 †	58.9 †	10.0 †
Toronto Central	7	Central West Toronto	67.6	45.9	41.9 *	41.2	57,389	62.2 * †	11.2 * †
Toronto Central	7	Don Valley/Greenwood**	67.9	45.7	37.0	41.5	62,179 * †	62.1 * †	11.1 * †
Toronto Central	7	East Toronto**	57.3 †	36.8	29.1	44.1 H	54,620	60.5 * †	10.1 †
South East	10	Rural Hastings**	56.9	36.9	27.7	41.4	45,275 * †	44.6 †	7.1 †
Champlain	11	Prescott-Russell Regional	85.0 * †	45.0	37.5	47.0 * †	47,821 †	49.8	7.5 †
Champlain	11	Stormont, Glengarry, Cornwall and Akwesasne	75.4	26.2	21.5	44.5 * †	53,758	44.3 †	8.2
North East	13	Cochrane North	.	.	.	39.9	56,220	62.6 * †	12.0 * †
North East	13	Cochrane South/Timmins**	59.4	46.9 *	34.4	47.6 * †	50,369	54.4	8.9
North East	13	Sault Ste. Marie	83.0 * †	37.0	28.0	40.6	54,008	44.8 †	8.2
North East	13	Temiskaming**	.	.	.	42.7	52,359	54.7	9.4
North West	14	District of Thunder Bay	.	.	.	42.1	56,134	59.3 *	11.5 * †

A5. Baseline Health Link Performance: Tables by Lead Organization Type

Lead Organization = CCAC			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN	HEALTH LINK (**= early adopter)		Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
#	Cohort (Palliative/End-of-Life) Average		72.4	39.3	35.4	40.2	54,962	54.1	9.0
HNHB	4	Burlington	64.4	35.6	23.0	34.0 * †	52,544	43.8 †	7.7 †
HNHB	4	Niagara North East	70.8	43.1	34.7	41.7	51,546	52.7	8.6
Central West	5	North Etobicoke-Malton-West Woodbridge**	75.8	44.4	41.4 * †	42.0	58,563 †	58.9 †	10.0 †
Mississauga Halton	6	South West Mississauga	81.8 * †	29.5	28.4	38.3	58,841 †	53.1	8.7
Toronto Central	7	West Toronto	69.2	35.9	28.2	38.6	59,275 †	54.9	10.0 †
Central East	9	Durham North East	71.2	39.6	32.3	41.3	54,816	55.1 †	9.1 †
Central East	9	Peterborough**	87.7 * †	26.4 †	40.1 * †	39.2	51,972	58.4 †	9.3 †
Champlain	11	Prescott-Russell Regional	85.0 * †	45.0	37.5	47.0 * †	47,821 †	49.8	7.5 †
North West	14	City of Thunder Bay	59.2 †	49.1 * †	39.7 * †	41.9	61,175 * †	58.2 †	10.3 †

Lead Organization = CHC			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN	HEALTH LINK (**= early adopter)		Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
#	Cohort (Palliative/End-of-Life) Average		58.2	35.6	28.0	41.6	49,680	49.9	8.0
Erie St. Clair	1	Chatham Kent	60.6	42.4	21.2 *	40.3	50,606	47.7	7.3 †
South West	2	South Grey Bruce	43.8 * †	54.2 * †	33.3	45.8 * †	45,119 * †	48.6	6.6 †
Waterloo Wellington	3	Cambridge	79.0 †	17.3 * †	18.5 * †	39.6	46,912 †	44.1 †	6.8 †
HNHB	4	Niagara South West	56.0	28.0	21.3 *	42.3	47,483 †	53.8	8.6
Mississauga Halton	6	South Etobicoke	72.9	22.9 * †	21.4	40.3	59,690 * †	58.0 †	10.5 * †
Toronto Central	7	Mid East Toronto**	66.1	27.4	24.2	36.4 *	55,493	54.8	10.2 †
South East	10	Quinte**	53.7 †	38.3	31.9	42.7	46,016 †	45.7 †	6.7 †
South East	10	Rideau Tay	42.1 * †	48.7 * †	32.9	46.7 * †	52,361	52.7	8.3
South East	10	Rural Hastings**	56.9	36.9	27.7	41.4	45,275 * †	44.6 †	7.1 †
South East	10	Rural Kingston**	42.4 * †	30.3	24.2	37.9	45,962	40.8 * †	6.5 * †
South East	10	Salmon River	.	.	.	41.9	47,595	43.8 †	6.1 * †
North Simcoe Muskoka	12	North Simcoe Collaborative	.	.	.	42.6	47,547 †	50.4	7.8
North East	13	Cochrane North	.	.	.	39.9	56,220	62.6 * †	12.0 * †
North East	13	Temiskaming**	.	.	.	42.7	52,359	54.7	9.4

Lead Organization = Hospital			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN	HEALTH LINK (**= early adopter)		Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
#	Cohort (Palliative/End-of-Life) Average		64.6	35.1	29.4	40.0	53,842	51.4	8.6
South West	2	North Grey Bruce	52.9	26.5	20.6 *	41.6	42,605 * †	43.7 †	6.1 * †
HNHB	4	Brant Six Nations	69.6	26.1	19.6 *	40.2	46,013 †	44.7 †	7.0 †
HNHB	4	Haldimand	68.6	37.1	22.9	44.1 *	47,719 †	56.3	9.0
HNHB	4	Hamilton East	71.2	28.8	22.0	36.3 * †	57,327 †	50.2	8.9
HNHB	4	Hamilton West	63.9	25.3 * †	22.9	32.5 * †	56,524 †	44.4 †	8.0
HNHB	4	Niagara North West	80.9 †	46.8 *	25.5	40.4	46,572 †	39.8 * †	6.6 * †
HNHB	4	Niagara South East	67.1	35.6	23.3	38.3	49,181 †	53.7	8.7
HNHB	4	Norfolk	44.0 * †	32.0	20.0 *	41.2	46,101 †	51.5	8.0
Central West	5	Bolton-Caledon	.	.	.	38.4	45,228 * †	44.7	7.2
Central West	5	Bramalea and Area	67.3	27.3	25.5	41.4	52,808	51.9	8.4
Central West	5	Brampton and Area	70.7	31.7	35.4	43.0	51,794	52.7	8.0
Central West	5	Dufferin and Area**	64.9	35.1	29.7	44.0	51,150	55.4	7.9
Toronto Central	7	North East Toronto	73.7	23.7 * †	32.9	37.7	59,854 * †	55.8 †	10.0 †
Toronto Central	7	North West Toronto	52.9 †	25.7	28.6	35.6 * †	58,459 †	53.3	9.3
Toronto Central	7	South Toronto	73.5	30.8	28.2	36.9 †	59,885 * †	56.5 †	10.5 * †
Central	8	North York Central**	67.1	37.1	33.6	41.3	56,276 †	58.2 †	9.7 †
Central	8	South Simcoe and Northern York Region**	53.0 †	45.8 †	32.7	41.6	52,541	49.4	8.2
Central	8	South West York Region	58.6 †	42.9	38.4 * †	43.4 †	58,519 †	60.2 * †	10.0 †
Champlain	11	Arnprior Region and Ottawa West	59.5	45.8 †	30.5	37.5	56,105	40.3 * †	7.0 †
Champlain	11	South Renfrew	65.6	25.0 *	31.3	37.4	46,424 †	37.4 * †	6.4 * †
Champlain	11	Stormont, Glengarry, Cornwall and Akwesasne	75.4	26.2	21.5	44.5 * †	53,758	44.3 †	8.2
Champlain	11	Upper Canada	69.8	32.6	25.6	42.8	50,454	45.8 †	7.6 †
North West	14	District of Thunder Bay	.	.	.	42.1	56,134	59.3 *	11.5 * †

Lead Organization = FHT			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	71.2	35.1	28.3	39.5	53,002	50.8	8.5
South West	2	Huron-Perth County**	64.5	46.1 *	38.2 *	37.7	45,465 †	45.8 †	6.9 †
South West	2	London-Middlesex County	78.0 †	26.7 †	27.6	38.3 †	53,198	53.1	8.7
Waterloo Wellington	3	Guelph**	78.2 †	33.3	29.5	43.4	47,729 †	38.1 * †	7.3 †
Waterloo Wellington	3	Kitchener-Waterloo	80.5 †	28.5 †	22.2 †	36.8 * †	48,518 †	46.8 †	7.4 †
Waterloo Wellington	3	Rural Wellington	75.0	41.7	25.0	37.4	42,935 * †	35.2 * †	5.3 * †
HNHB	4	Hamilton Central**	67.8	36.4	28.8	40.9	58,821 †	52.8	9.6 †
Mississauga Halton	6	East Mississauga**	81.0 †	36.7	32.6	37.9	59,049 †	56.0 †	9.9 †
Mississauga Halton	6	Halton Hills	90.0 * †	32.5	27.5	40.0	52,868	52.5	8.9
Toronto Central	7	East Toronto**	57.3 †	36.8	29.1	44.1 †	54,620	60.5 * †	10.1 †
Toronto Central	7	Mid-West Toronto**	73.8	39.8	34.4	38.7	62,676 * †	56.7 †	9.9 †
South East	10	Kingston**	49.1 * †	39.1	26.4	37.2 †	53,778	49.9	8.6
South East	10	Thousand Islands**	25.0 * †	37.5	26.0	43.2	49,754	54.2	8.2
Champlain	11	North Renfrew County	.	.	.	39.6	47,583 †	53.3	9.0
North Simcoe Muskoka	12	Barrie Community**	78.8 †	32.6	22.0	37.9	51,328	42.7 †	7.3 †
North Simcoe Muskoka	12	Couchiching	83.7 * †	25.6 *	.	43.7	48,168 †	46.7 †	6.8 †
North Simcoe Muskoka	12	South Georgian Bay Community**	79.1 †	37.3	31.3	42.2	45,326 * †	47.2	7.5 †
North East	13	Cochrane South/Timmins**	59.4	46.9 *	34.4	47.6 * †	50,369	54.4	8.9

Lead Organization = Other			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	74.8	41.5	33.7	41.0	55,485	52.5	9.2
		NOT ASSIGNED	67.4	34.4	28.1	40.6	52,428	50.8	8.5
Toronto Central	7	Central West Toronto	67.6	45.9	41.9 *	41.2	57,389	62.2 * †	11.2 * †
Toronto Central	7	Don Valley/Greenwood**	67.9	45.7	37.0	41.5	62,179 * †	62.1 * †	11.1 * †
North Simcoe Muskoka	12	Muskoka Community	.	.	.	40.9	47,000 †	43.2 †	6.7 †
North East	13	Sault Ste. Marie	83.0 * †	37.0	28.0	40.6	54,008	44.8 †	8.2

Lead Organization = CCAC			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN	HEALTH LINK (**= early adopter)		Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
#	Cohort (Palliative/End-of-Life) Average		72.4	39.3	35.4	40.2	54,962	54.1	9.0
HNHB	4	Burlington	64.4	35.6	23.0	34.0 * †	52,544	43.8 †	7.7 †
HNHB	4	Niagara North East	70.8	43.1	34.7	41.7	51,546	52.7	8.6
Central West	5	North Etobicoke-Malton-West Woodbridge**	75.8	44.4	41.4 * †	42.0	58,563 †	58.9 †	10.0 †
Mississauga Halton	6	South West Mississauga	81.8 * †	29.5	28.4	38.3	58,841 †	53.1	8.7
Toronto Central	7	West Toronto	69.2	35.9	28.2	38.6	59,275 †	54.9	10.0 †
Central East	9	Durham North East	71.2	39.6	32.3	41.3	54,816	55.1 †	9.1 †
Central East	9	Peterborough**	87.7 * †	26.4 †	40.1 * †	39.2	51,972	58.4 †	9.3 †
Champlain	11	Prescott-Russell Regional	85.0 * †	45.0	37.5	47.0 * †	47,821 †	49.8	7.5 †
North West	14	City of Thunder Bay	59.2 †	49.1 * †	39.7 * †	41.9	61,175 * †	58.2 †	10.3 †

Lead Organization = CHC			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN	HEALTH LINK (**= early adopter)		Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
#	Cohort (Palliative/End-of-Life) Average		58.2	35.6	28.0	41.6	49,680	49.9	8.0
Erie St. Clair	1	Chatham Kent	60.6	42.4	21.2 *	40.3	50,606	47.7	7.3 †
South West	2	South Grey Bruce	43.8 * †	54.2 * †	33.3	45.8 * †	45,119 * †	48.6	6.6 †
Waterloo Wellington	3	Cambridge	79.0 †	17.3 * †	18.5 * †	39.6	46,912 †	44.1 †	6.8 †
HNHB	4	Niagara South West	56.0	28.0	21.3 *	42.3	47,483 †	53.8	8.6
Mississauga Halton	6	South Etobicoke	72.9	22.9 * †	21.4	40.3	59,690 * †	58.0 †	10.5 * †
Toronto Central	7	Mid East Toronto**	66.1	27.4	24.2	36.4 *	55,493	54.8	10.2 †
South East	10	Quinte**	53.7 †	38.3	31.9	42.7	46,016 †	45.7 †	6.7 †
South East	10	Rideau Tay	42.1 * †	48.7 * †	32.9	46.7 * †	52,361	52.7	8.3
South East	10	Rural Hastings**	56.9	36.9	27.7	41.4	45,275 * †	44.6 †	7.1 †
South East	10	Rural Kingston**	42.4 * †	30.3	24.2	37.9	45,962	40.8 * †	6.5 * †
South East	10	Salmon River	.	.	.	41.9	47,595	43.8 †	6.1 * †
North Simcoe Muskoka	12	North Simcoe Collaborative	.	.	.	42.6	47,547 †	50.4	7.8
North East	13	Cochrane North	.	.	.	39.9	56,220	62.6 * †	12.0 * †
North East	13	Temiskaming**	.	.	.	42.7	52,359	54.7	9.4

Lead Organization = Hospital			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN	HEALTH LINK (**= early adopter)		Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
#	Cohort (Palliative/End-of-Life) Average		64.6	35.1	29.4	40.0	53,842	51.4	8.6
South West	2	North Grey Bruce	52.9	26.5	20.6 *	41.6	42,605 * †	43.7 †	6.1 * †
HNHB	4	Brant Six Nations	69.6	26.1	19.6 *	40.2	46,013 †	44.7 †	7.0 †
HNHB	4	Haldimand	68.6	37.1	22.9	44.1 *	47,719 †	56.3	9.0
HNHB	4	Hamilton East	71.2	28.8	22.0	36.3 * †	57,327 †	50.2	8.9
HNHB	4	Hamilton West	63.9	25.3 * †	22.9	32.5 * †	56,524 †	44.4 †	8.0
HNHB	4	Niagara North West	80.9 †	46.8 *	25.5	40.4	46,572 †	39.8 * †	6.6 * †
HNHB	4	Niagara South East	67.1	35.6	23.3	38.3	49,181 †	53.7	8.7
HNHB	4	Norfolk	44.0 * †	32.0	20.0 *	41.2	46,101 †	51.5	8.0
Central West	5	Bolton-Caledon	.	.	.	38.4	45,228 * †	44.7	7.2
Central West	5	Bramalea and Area	67.3	27.3	25.5	41.4	52,808	51.9	8.4
Central West	5	Brampton and Area	70.7	31.7	35.4	43.0	51,794	52.7	8.0
Central West	5	Dufferin and Area**	64.9	35.1	29.7	44.0	51,150	55.4	7.9
Toronto Central	7	North East Toronto	73.7	23.7 * †	32.9	37.7	59,854 * †	55.8 †	10.0 †
Toronto Central	7	North West Toronto	52.9 †	25.7	28.6	35.6 * †	58,459 †	53.3	9.3
Toronto Central	7	South Toronto	73.5	30.8	28.2	36.9 †	59,885 * †	56.5 †	10.5 * †
Central	8	North York Central**	67.1	37.1	33.6	41.3	56,276 †	58.2 †	9.7 †
Central	8	South Simcoe and Northern York Region**	53.0 †	45.8 †	32.7	41.6	52,541	49.4	8.2
Central	8	South West York Region	58.6 †	42.9	38.4 * †	43.4 †	58,519 †	60.2 * †	10.0 †
Champlain	11	Arnprior Region and Ottawa West	59.5	45.8 †	30.5	37.5	56,105	40.3 * †	7.0 †
Champlain	11	South Renfrew	65.6	25.0 *	31.3	37.4	46,424 †	37.4 * †	6.4 * †
Champlain	11	Stormont, Glengarry, Cornwall and Akwesasne	75.4	26.2	21.5	44.5 * †	53,758	44.3 †	8.2
Champlain	11	Upper Canada	69.8	32.6	25.6	42.8	50,454	45.8 †	7.6 †
North West	14	District of Thunder Bay	.	.	.	42.1	56,134	59.3 *	11.5 * †

Lead Organization = FHT			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	71.2	35.1	28.3	39.5	53,002	50.8	8.5
South West	2	Huron-Perth County**	64.5	46.1 *	38.2 *	37.7	45,465 †	45.8 †	6.9 †
South West	2	London-Middlesex County	78.0 †	26.7 †	27.6	38.3 †	53,198	53.1	8.7
Waterloo Wellington	3	Guelph**	78.2 †	33.3	29.5	43.4	47,729 †	38.1 * †	7.3 †
Waterloo Wellington	3	Kitchener-Waterloo	80.5 †	28.5 †	22.2 †	36.8 * †	48,518 †	46.8 †	7.4 †
Waterloo Wellington	3	Rural Wellington	75.0	41.7	25.0	37.4	42,935 * †	35.2 * †	5.3 * †
HNHB	4	Hamilton Central**	67.8	36.4	28.8	40.9	58,821 †	52.8	9.6 †
Mississauga Halton	6	East Mississauga**	81.0 †	36.7	32.6	37.9	59,049 †	56.0 †	9.9 †
Mississauga Halton	6	Halton Hills	90.0 * †	32.5	27.5	40.0	52,868	52.5	8.9
Toronto Central	7	East Toronto**	57.3 †	36.8	29.1	44.1 †	54,620	60.5 * †	10.1 †
Toronto Central	7	Mid-West Toronto**	73.8	39.8	34.4	38.7	62,676 * †	56.7 †	9.9 †
South East	10	Kingston**	49.1 * †	39.1	26.4	37.2 †	53,778	49.9	8.6
South East	10	Thousand Islands**	25.0 * †	37.5	26.0	43.2	49,754	54.2	8.2
Champlain	11	North Renfrew County	.	.	.	39.6	47,583 †	53.3	9.0
North Simcoe Muskoka	12	Barrie Community**	78.8 †	32.6	22.0	37.9	51,328	42.7 †	7.3 †
North Simcoe Muskoka	12	Couchiching	83.7 * †	25.6 *	.	43.7	48,168 †	46.7 †	6.8 †
North Simcoe Muskoka	12	South Georgian Bay Community**	79.1 †	37.3	31.3	42.2	45,326 * †	47.2	7.5 †
North East	13	Cochrane South/Timmins**	59.4	46.9 *	34.4	47.6 * †	50,369	54.4	8.9

Lead Organization = Other			PALLIATIVE INDICATORS			END-OF-LIFE INDICATORS			
LHIN		HEALTH LINK (**= early adopter)	Home support for palliative patients	ED visits within 30 days for discharged palliative patients	Palliative hospital readmission rate	Unscheduled ED visits in the last 2 weeks preceding death	Total cost at the end of life	Proportion of deaths in hospital	Days in hospital at the end of life
	#	Cohort (Palliative/End-of-Life) Average	74.8	41.5	33.7	41.0	55,485	52.5	9.2
		NOT ASSIGNED	67.4	34.4	28.1	40.6	52,428	50.8	8.5
Toronto Central	7	Central West Toronto	67.6	45.9	41.9 *	41.2	57,389	62.2 * †	11.2 * †
Toronto Central	7	Don Valley/Greenwood**	67.9	45.7	37.0	41.5	62,179 * †	62.1 * †	11.1 * †
North Simcoe Muskoka	12	Muskoka Community	.	.	.	40.9	47,000 †	43.2 †	6.7 †
North East	13	Sault Ste. Marie	83.0 * †	37.0	28.0	40.6	54,008	44.8 †	8.2

A6. Baseline Health Link Performance: Indicator Distributions (Decile-Ranked)

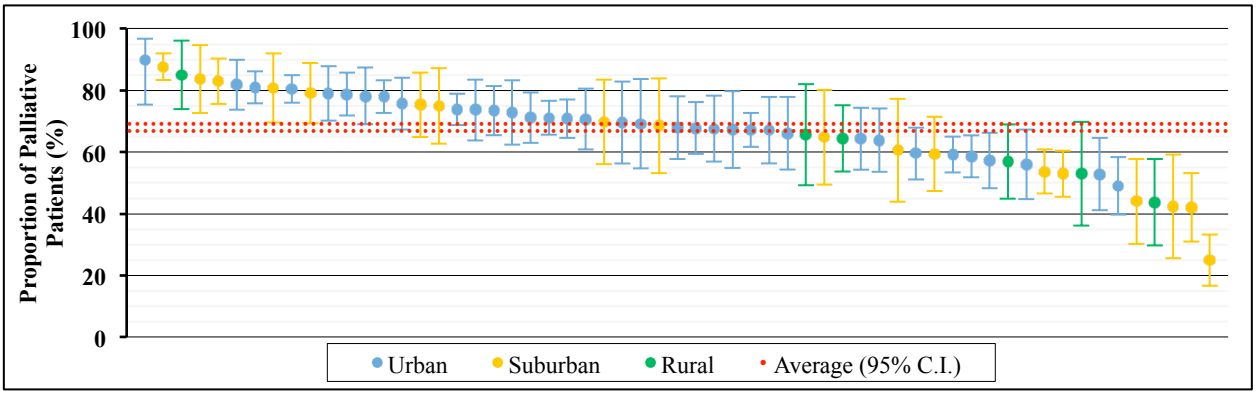
Distribution of indicator values used to create deciles highlighting high and low performance:

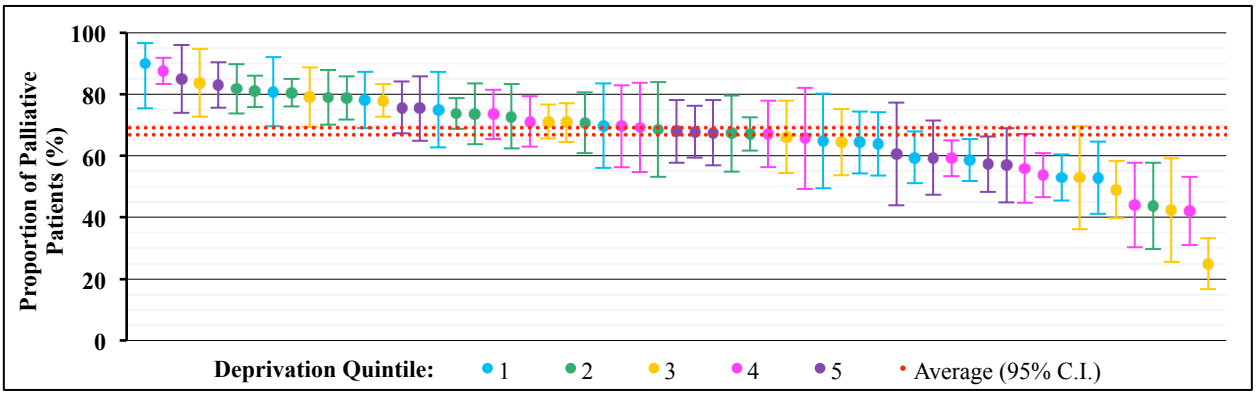
	Palliative Care Indicators			End-of-Life Indicators			
	Home support for palliative patients (%)	ED visits within 30 days for discharged palliative patients (%)	Palliative hospital readmission rate (%)	Unscheduled ED visits in the last 2 weeks preceding death (%)	Total cost at the end of life (mean $)	Proportion of deaths in hospital (%)	(Mean) Days in hospital at the end of life
Minimum (High Performance)	90.0	17.3	18.5	32.5	42,605	35.2	5.3
10th Percentile	81.2	25.7	21.4	37.1	45,714	43.0	6.6
20th Percentile	78.4	27.1	22.9	37.9	46,912	44.5	7.0
30th Percentile	73.8	27.1	22.9	37.9	46,912	44.5	7.0
40th Percentile	70.8	32.6	27.3	40.1	50,369	49.6	8.0
50th Percentile	67.9	35.9	28.3	40.9	51,883	52.5	8.3
60th Percentile	66.3	37.1	29.9	41.5	52,868	53.2	8.7
70th Percentile	57.1	39.4	32.6	42.0	55,155	54.7	9.1
80th Percentile	57.1	43.6	34.0	42.8	57,389	56.3	9.9
90th Percentile	52.1	46.0	37.7	44.0	59,162	58.6	10.2
Maximum (Low Performance)	25.0	54.2	41.9	47.6	62,676	62.6	12.0

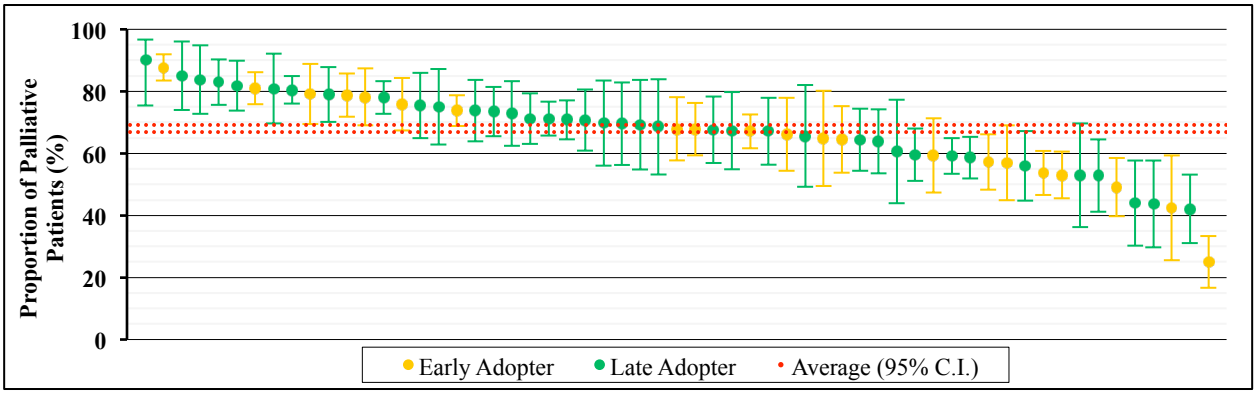
A7. Baseline Health Link Performance: Caterpillar Plots

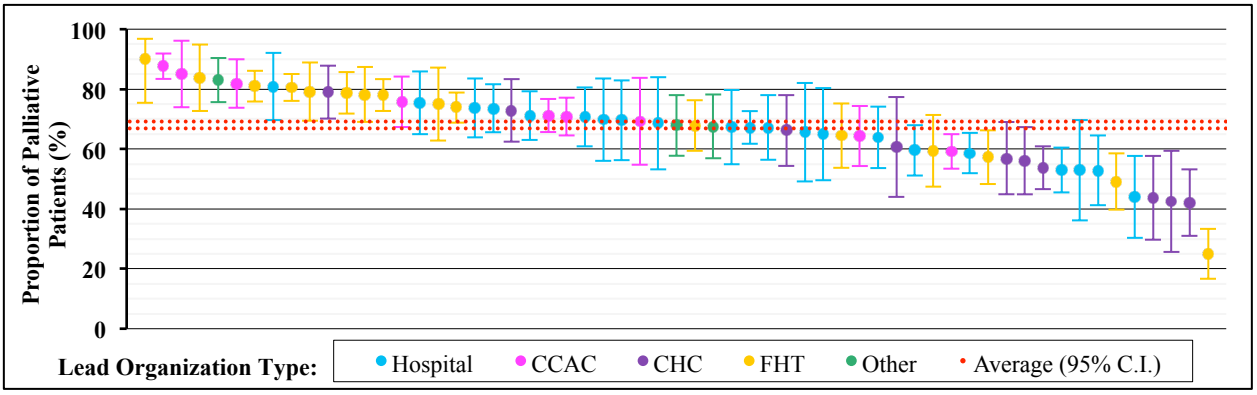
Caterpillar plots were generated to visualize the distribution of indicator estimates across HLs relative to Ontario averages, and to compare trends across HLs grouped by rurality, deprivation index, and lead organization type. Caterpillar plots display HL performance scores and corresponding 95% confidence intervals (95% CI) and are ordered in the plots from highest to lowest values.

Palliative 1. Home support for palliative patients

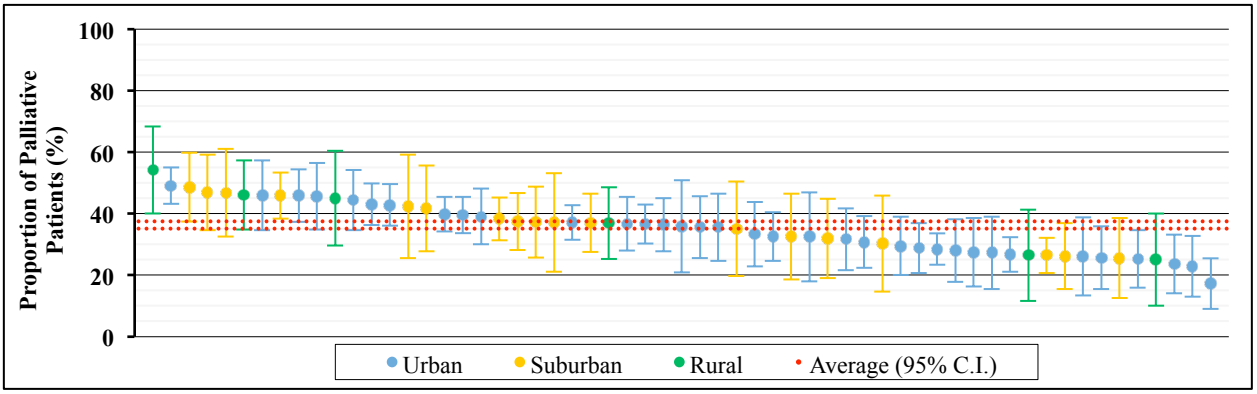


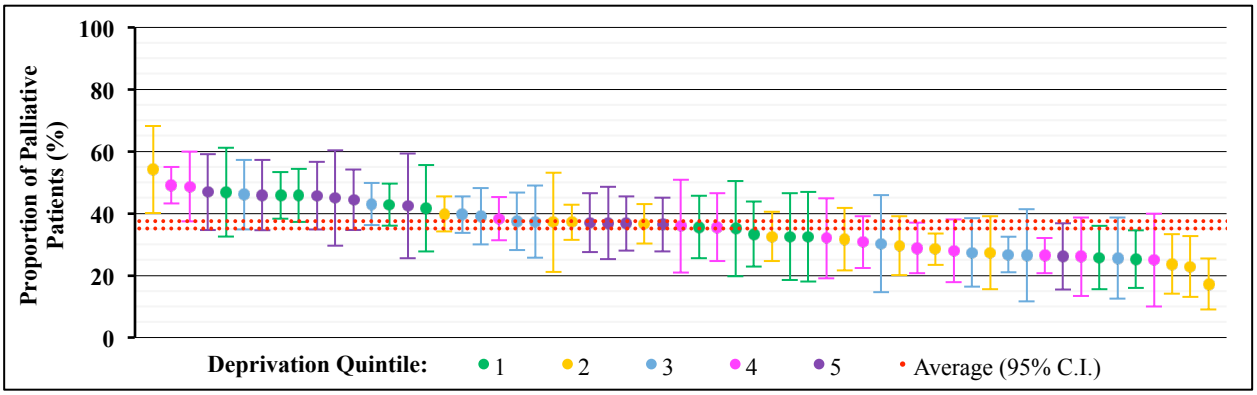


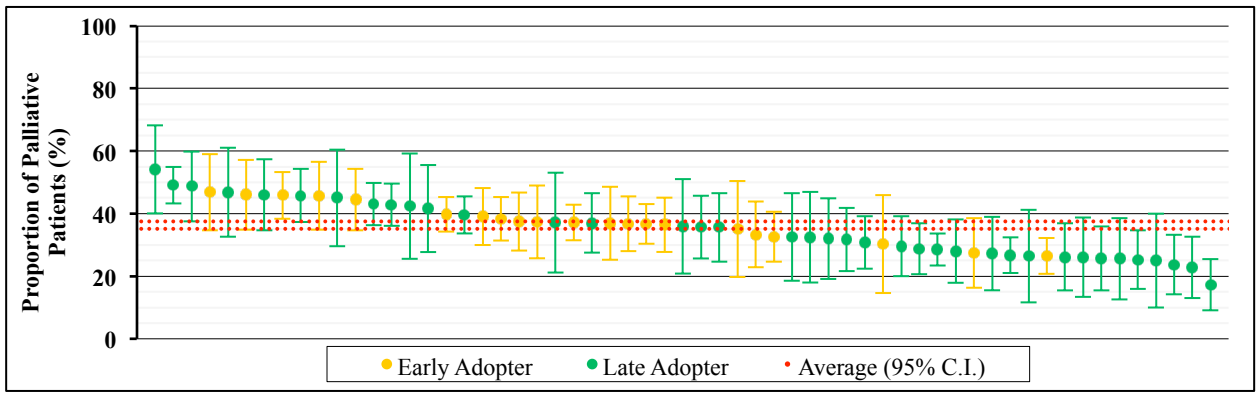


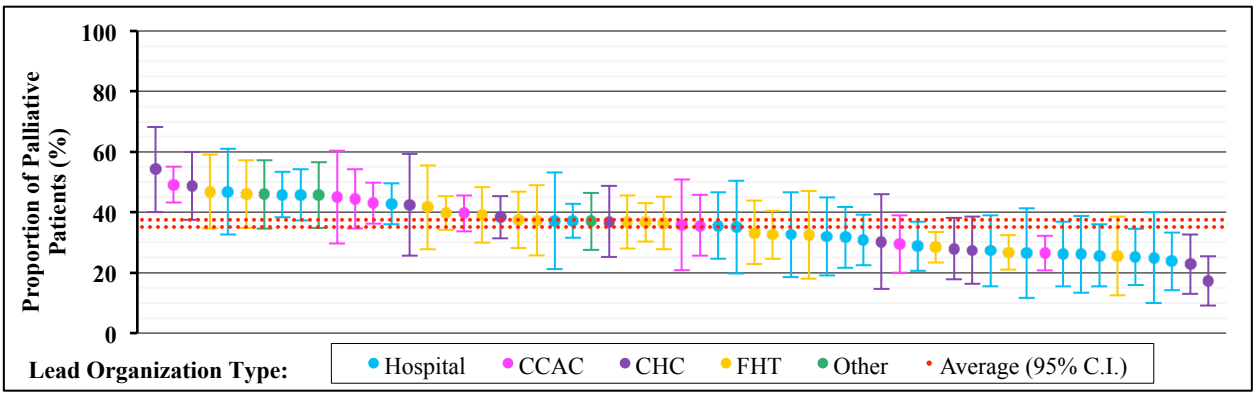


Palliative 2. ED visits within 30 days for discharged palliative patients.

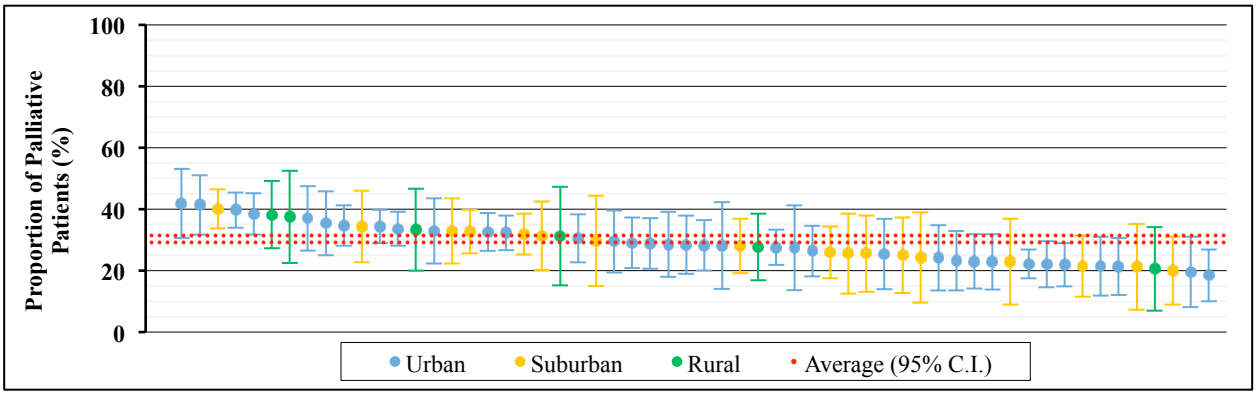


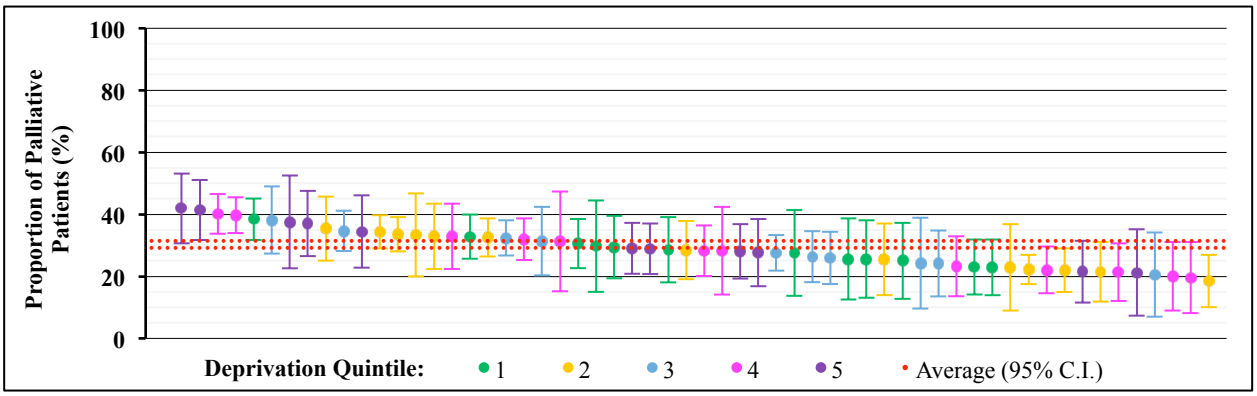


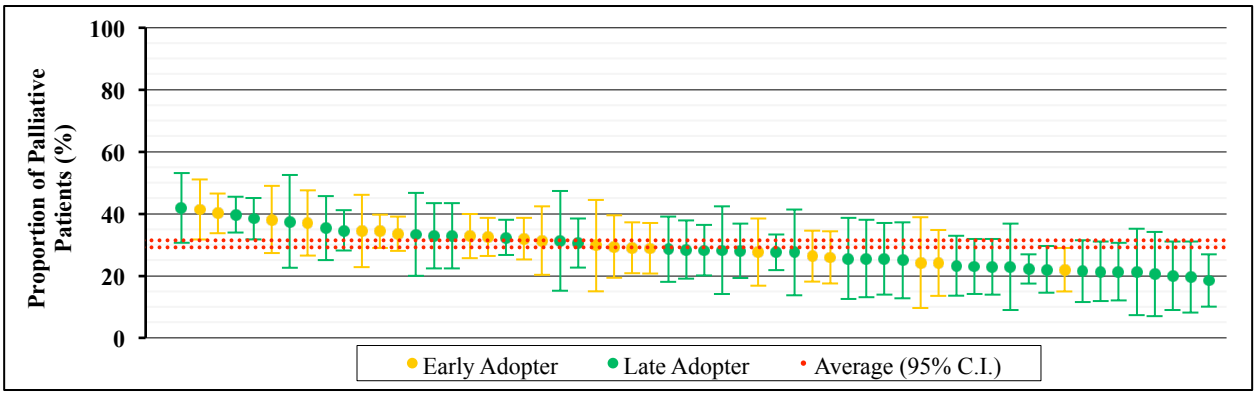


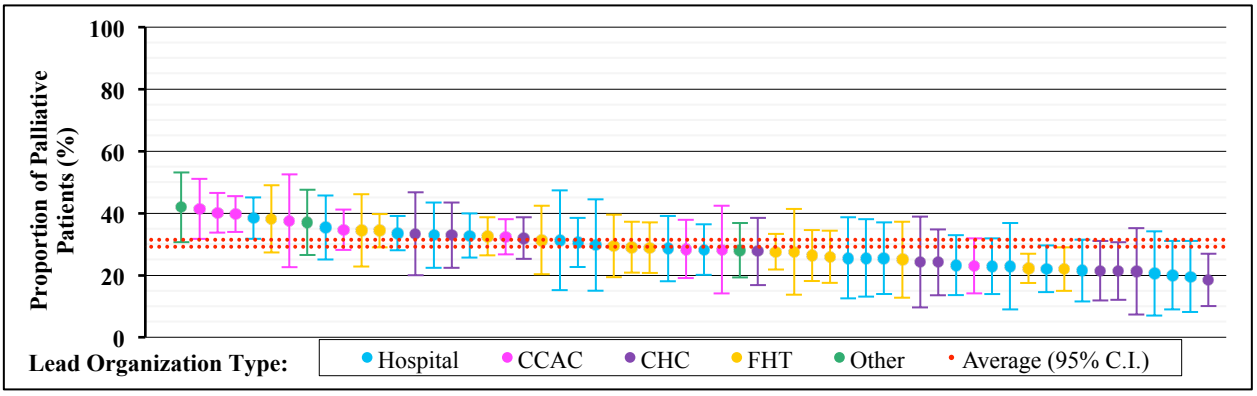


Palliative 3. Palliative hospital readmission rate

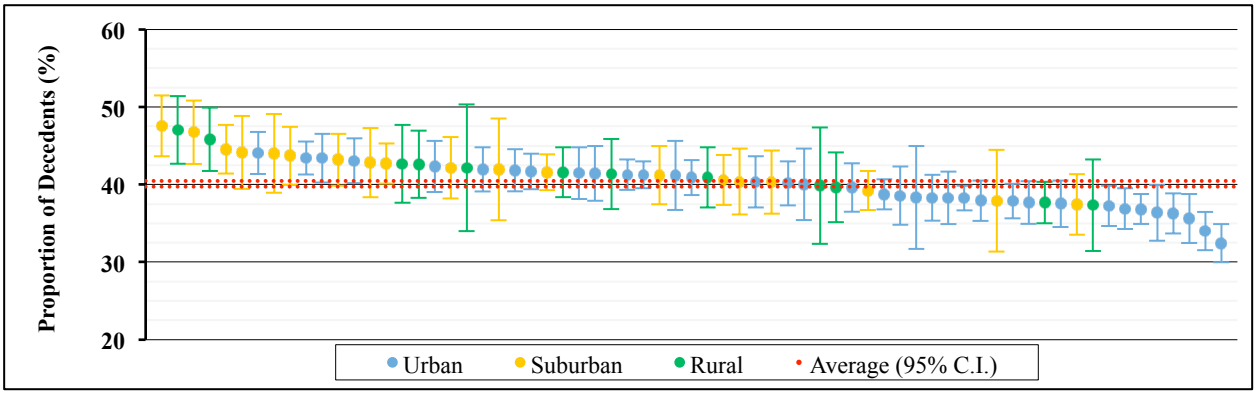


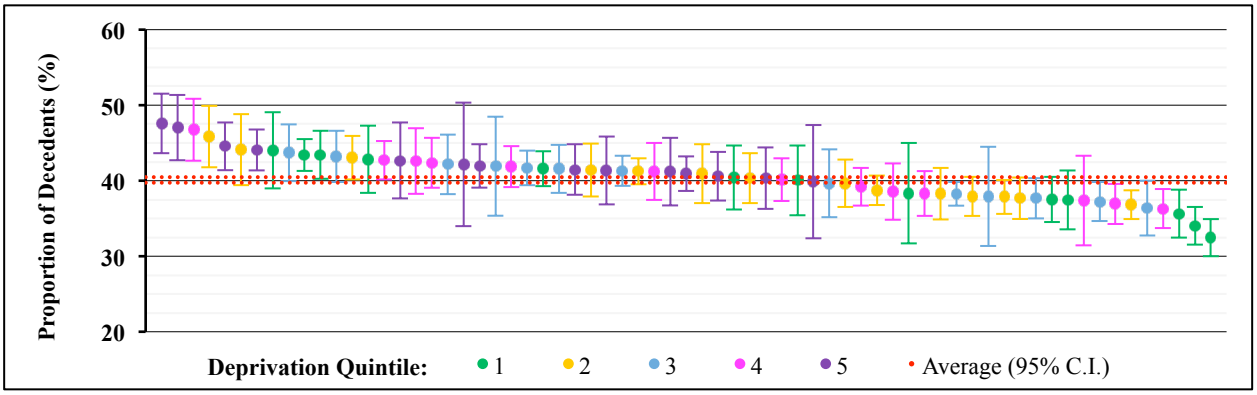


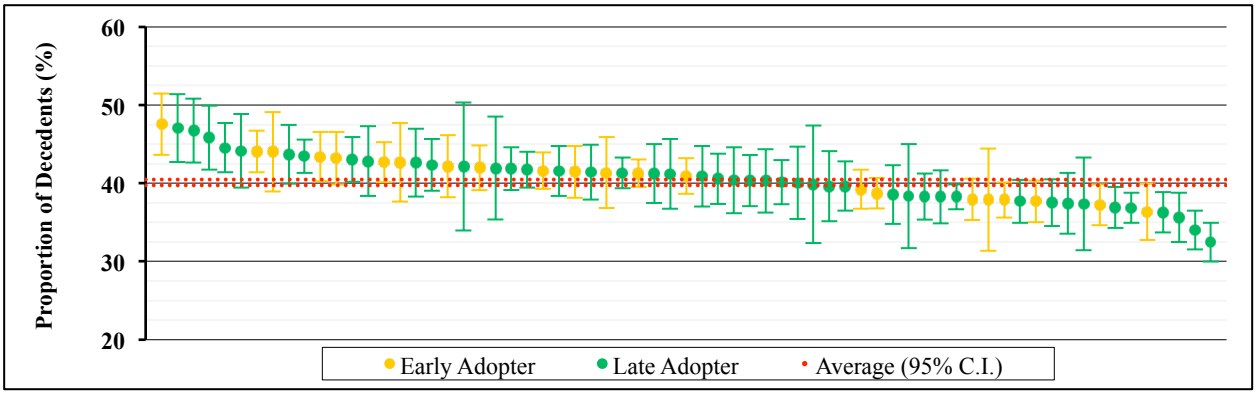


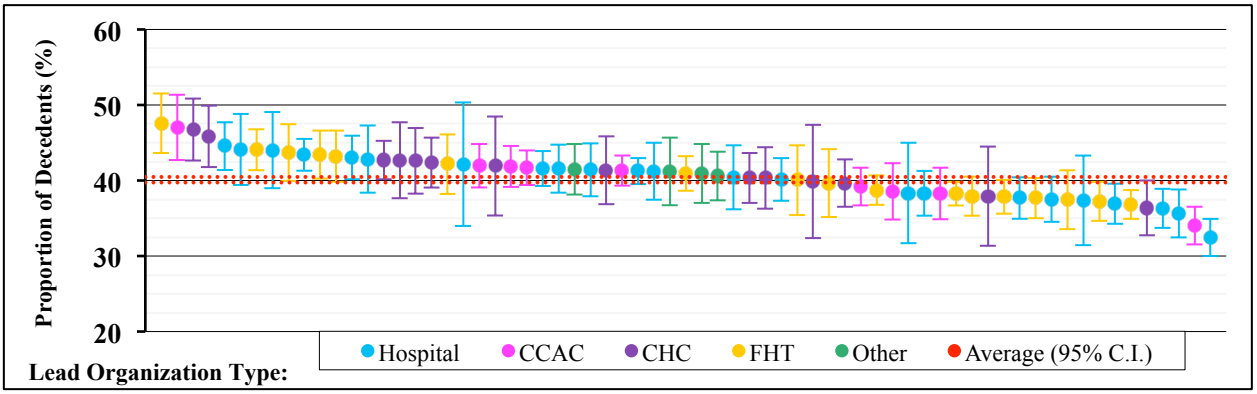


End-of-life 1. Unscheduled ED visit in the last 2 weeks of life

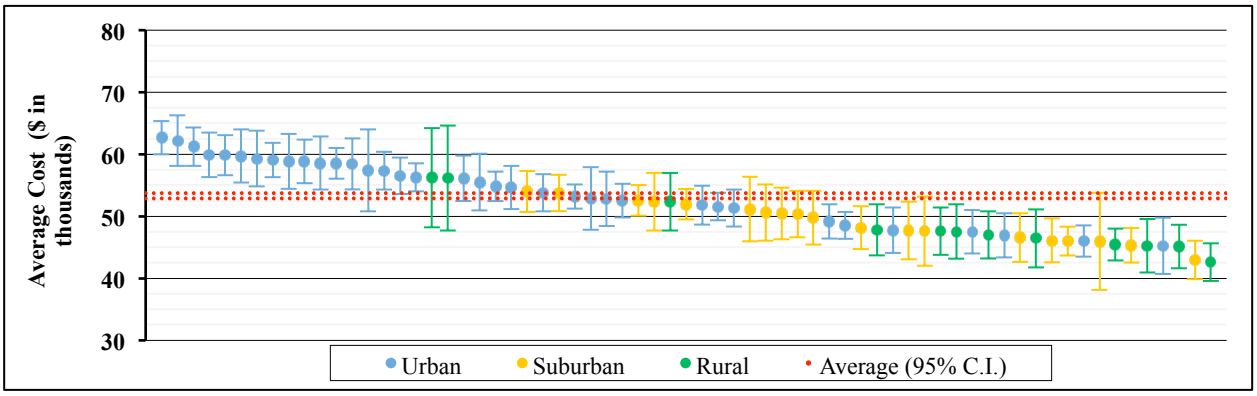


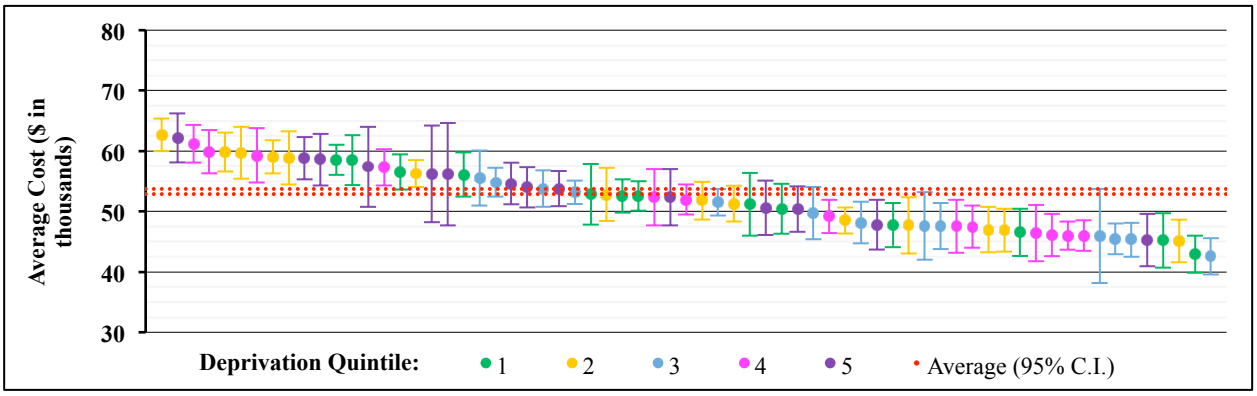


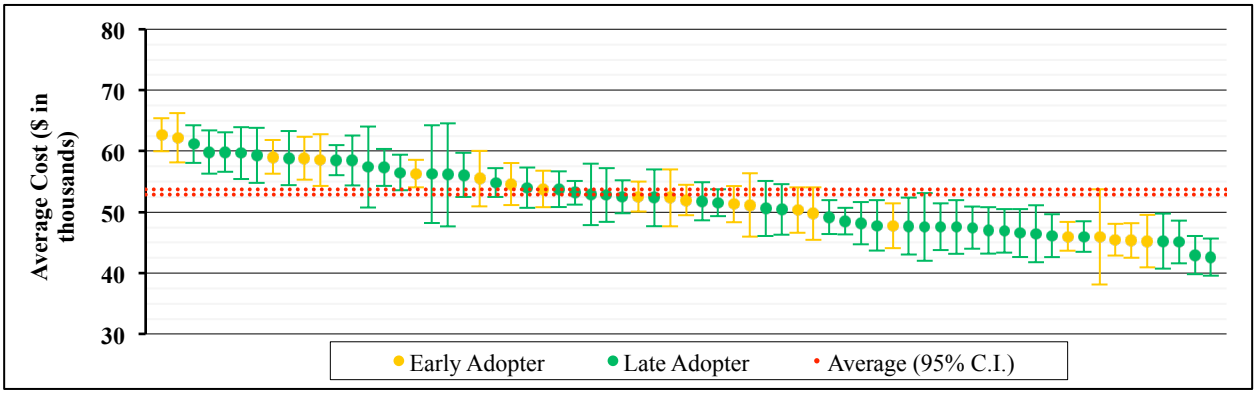


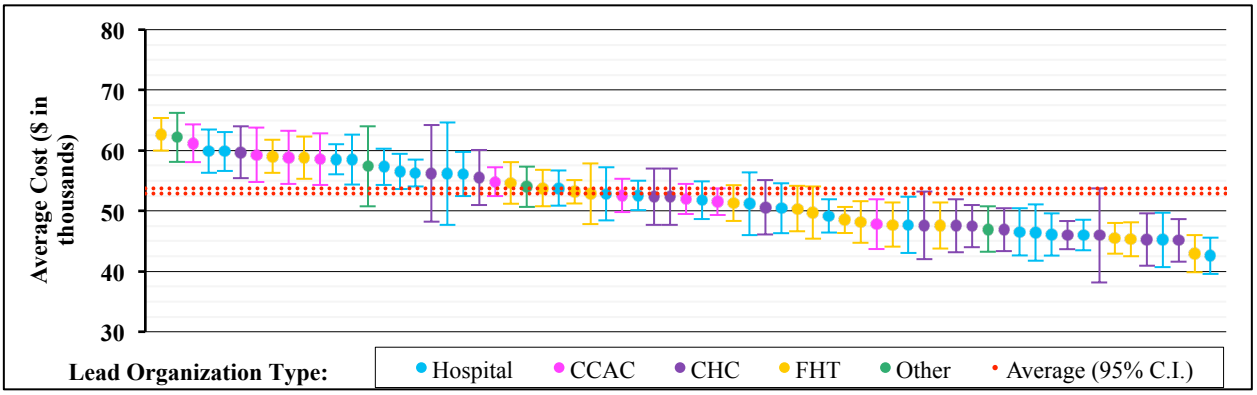


End-of-life 2. Total Costs in the last year of life

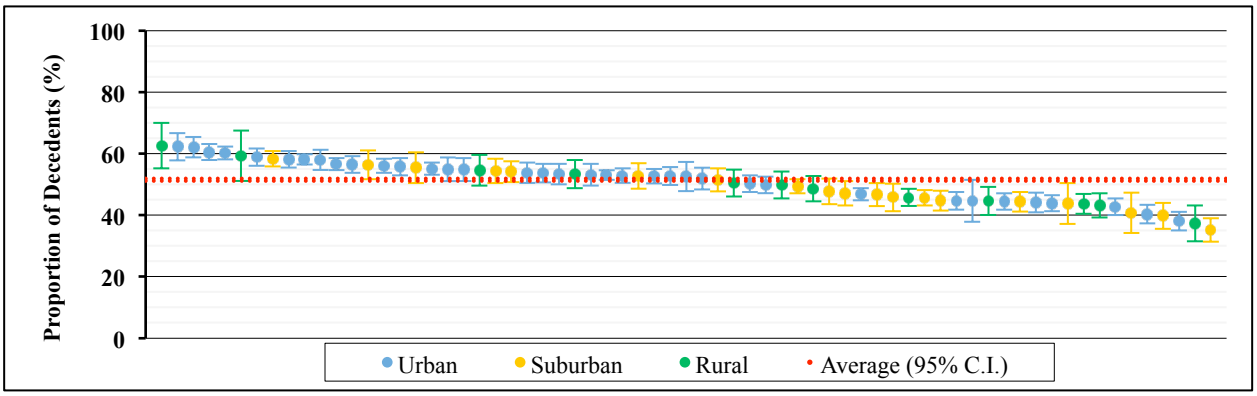


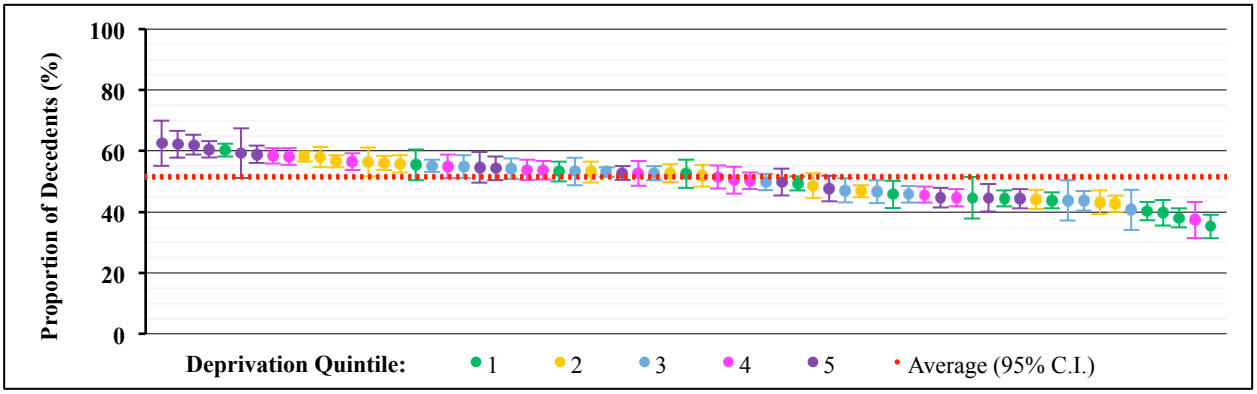


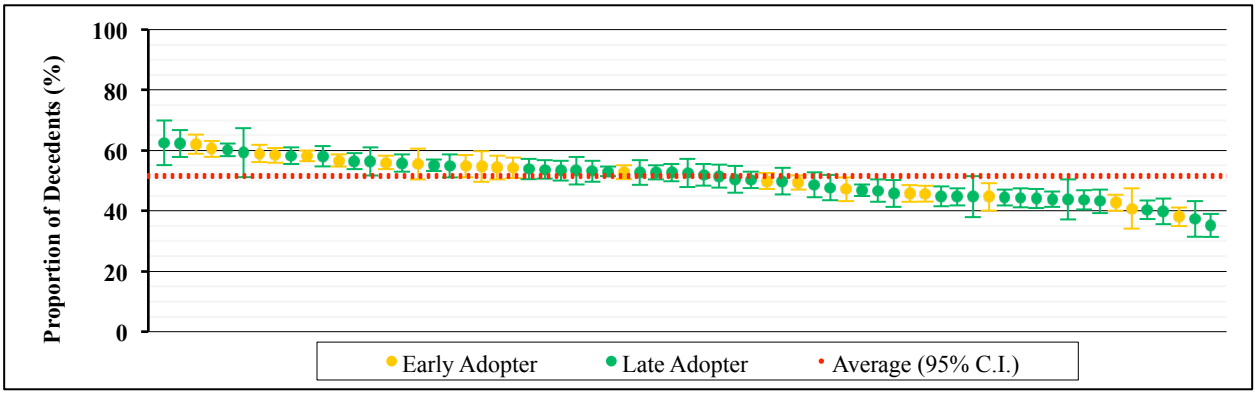


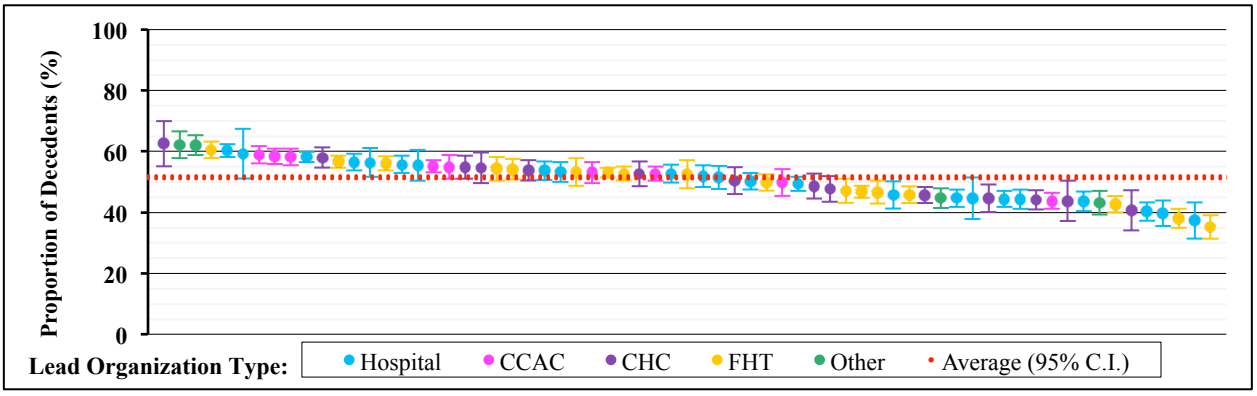


End-of-life 3. Proportion of deaths in hospital

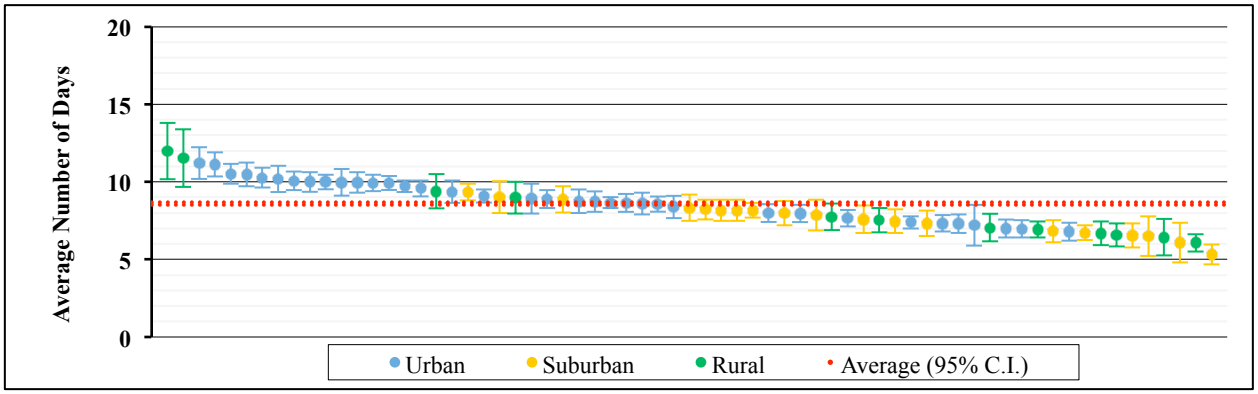


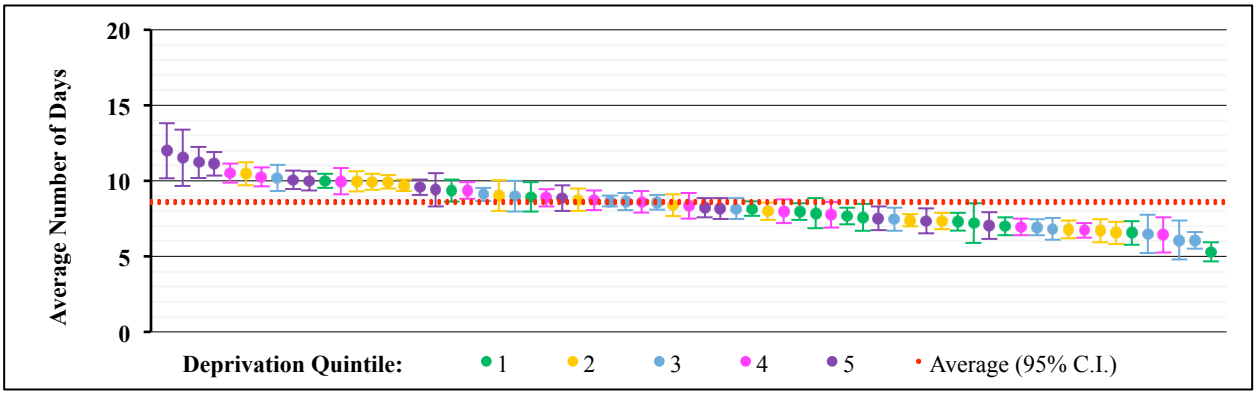


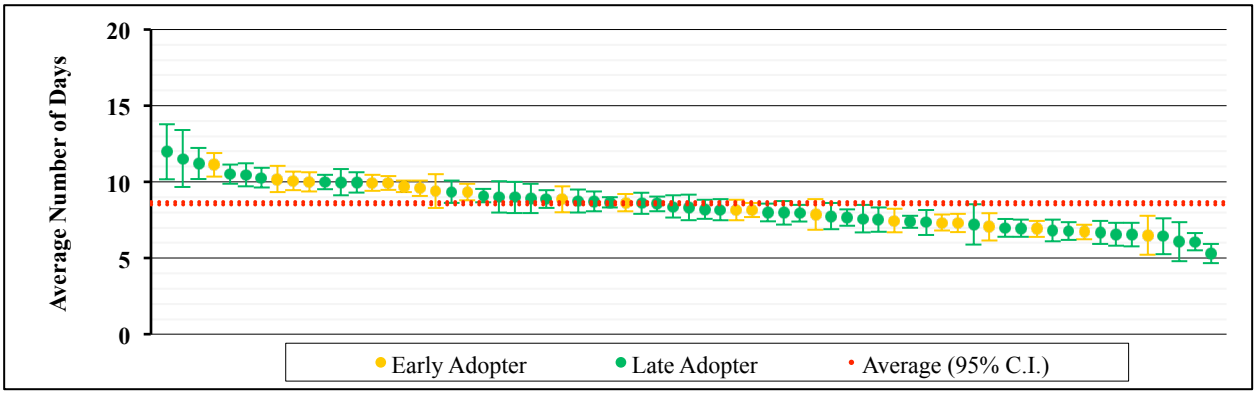




End-of-life 4. Total days in hospital in the last 30days of life (mean)







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