CorHealth Ontario

Advancing cardiac, stroke and vascular care

Ontario Stroke Report FY 2019-20

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Introduction

Ontario's Annual Stroke Report provides an overview of stroke system performance in the province. The eleven (11) provincial stroke networks use this report to enable system planning and decision making, reflecting best practice, leading to system improvements, and ultimately better outcomes for patients and families with stroke.

The reporting period for this Report covers fiscal year 2019/20 and, where feasible, includes additional data from 2015/16-2018/19 to provide trending over a five-year period. CorHealth Ontario (CorHealth) has provided as timely data as possible in this Report, though time periods for some individual indicators may not include all fiscal years due to lag time in data availability and the length of follow-up required.

The ICES Data & Analytic Virtual Environment (IDAVE) platform was used by CorHealth to populate most of the indicators in this report. CorHealth reviewed and, where necessary, clarified historical cohort methodologies with ICES and updated and/or enhanced these methodologies and the technical documentation.

About this Report

This Ontario Stroke Report FY 2019/20 is divided into four (4) chapters, with indicators in each chapter focusing on an aspect of the stroke care continuum. Each of the indicators contained in this report will be presented on their own page. Each indicator page will include a:

- Provincial summary graph of performance for fiscal years 2015/16 to 2019/20 (where data are available)
- Local Health Integration Network (LHIN) summary graph for fiscal year 2019/20

Select indicators have also been reported at the hospital level. Hospitals included in hospital-level reporting are Regional Stroke Centres, District Stroke Centres, stroke unit only centres, and inpatient rehabilitation sites (where applicable). For a list of Ontario hospitals with an acute stroke program, please refer to Appendix A. All LHIN and site abbreviations used in the report can be found in Appendix B.

In Chapter 2, Hyperacute Care Access and Outcomes for Ischemic Stroke, the indicator page for the Endovascular Thrombectomy (EVT) indicators (2.3 – 2.6), will include a:

- Provincial summary graph of performance for fiscal years 2017/16 to 2019/20 (where data are available)
- EVT hospital level graph for fiscal year 2019/20

In addition to this Report, a supplementary data file for each indicator has been provided to all Regional Stroke Directors and District Stroke Coordinators, to enable a more detailed review of performance. This supplementary data file includes provincial, LHIN, and site and/or sub-region level results for all performance indicators included in this report, as well as the numerator and denominator used to calculate these results.

Methodology

Data Sources and Environment

Linkable datasets via encrypted health card numbers were made available to CorHealth via ICES' Data & Analytic Virtual Environment (IDAVE) and the Ministry of Health's (MOH), Health Data Branch. Data sources: DAD, NACRS, RPDB, ODB, OHIP, CCRS, NRS, HCD, PCCF+ (V7B)

Cohorts

The stroke and transient ischemic attack (TIA) adult population of interest were identified using the following criteria:

- Ages 18 and older
- International Classification of Diseases, 10th Revision, Canada (ICD-10-CA) codes: G45 (excluding G45.4), H34.0, H34.1, I60 (excluding I60.8), I61, I63 (excluding I63.6) and I64 in the DAD and NACRS databases. Refer to Appendix C for the ICD-10-CA code definitions.
- Only first (index) stroke patients for each 12-month period, from April 1 to March 31 were included

The stroke and TIA emergency department/acute care cohorts are defined to ensure the homogeneity of cohort patients by focusing only on the first (index) stroke or TIA admission in a given fiscal year where stroke or TIA is the most responsible diagnosis (MRDx), and the stroke event occurred prior to admission to acute care. Patients considered palliative (ICD-10-CA, code Z51.5 with prefix 8) as part of their initial treatment plan were excluded.

For Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke, the cohort has been designed to capture all actual and potential EVT patients and includes:

- Ischemic stroke patients whose MRDx may not have been a stroke diagnosis
- Patients whose ischemic stroke occurred after admission to acute care

Additional considerations were implemented to identify patients receiving home-based rehabilitation therapy. A minimum threshold of three (3) patient visits in the Home and Community Care data was used to identify home-based rehabilitation patients.

Methodology

Reporting

Where appropriate, provincial benchmark values were calculated using the Achievable Benchmarks of Care (ABC) methodology based on hospitals or sub-regions which were highest performing and accounted for at least 20% of the population.[1] To ensure that high-performing care providers with low numbers of patients did not unduly influence the benchmark rates, acute and rehabilitation hospitals or sub-regions that had a cohort size of less than 30 were not included in the benchmark calculations.

For considerations regarding performance status of standardized indicators refer to Appendix D.

Hyperacute stroke care indicators were derived from data provided by the Ministry of Health's (MOH), Health Data Branch. All other indicators were derived from data provided by ICES in the IDAVE platform.

Additional details on methodology and cohorts can be found in the Technical Specifications document, including suppression criteria applied to comply with privacy legislation.

Overall Performance

Hyperacute and Acute Care

Stroke is a medical emergency that benefits from timely intervention that can reduce brain damage and help improve outcomes after stroke. There are two key hyperacute interventions targeting ischemic stroke: tissue plasminogen activator (tPA) and Endovascular Thrombectomy (EVT). EVT is a highly specialized procedure and in 2019/20 ten (10) hospitals had established EVT programs in the province. In the last quarter of 2019/20, Health Sciences North in Sudbury started their EVT program, making a total of eleven (11) hospitals in the province providing this specialized care. Access to hyperacute care has grown in the past years, and most of this growth is attributed to the introduction and steady growth in organized hyperacute stroke protocols for access to tPA and EVT, as well as continuous quality improvement and monitoring.

The goal of early acute treatment is to restore blood flow to the brain and to preserve brain tissue. Median door to needle time for patients who received tPA decreased from 47 minutes (2018/19) to 45 minutes (2019/20) equating to approximately 4 million neurons saved per patient.[2] It is important that work continues to reduce door to needle times towards a target of 30 minutes, to optimize the effectiveness of this treatment in reducing the impact of stroke.[3]

In addition to rapid triage, assessment, diagnosis, and treatment of patients experiencing acute ischemic stroke, increasing public awareness to call 911 may also contribute to more timely access to hyperacute stroke treatment. Ambulance personnel are trained to recognize the signs and symptoms of stroke and bypass community hospitals to go directly to specialized stroke centres capable of providing hyperacute treatment. However, the provincial trend for the last five fiscal years, remains at less than 60% of stroke patients who called 911.

Patients who receive stroke unit care are more likely to survive, return home and regain independence compared to patients who receive generalized care.[2] In 2019/20, only 54% of Ontario's stroke patients received care on a stroke unit, and there is a wide range across LHINs (16% - 81%) in the proportion of patients that received care on a stroke unit. Access to stroke unit care has also been found to influence access to other stroke best practices such as timely and appropriate stroke rehabilitation and applicable diagnostics such as carotid imaging. Further system planning is required to optimize the benefits of stroke unit care and meet the target of 75% access.[3]

Overall Performance

Rehabilitation Services

Stroke rehabilitation is a critical component of recovery, helping patients to regain lost skills, relearn tasks and regain independence. Stroke rehabilitation is an essential part of the care continuum, requiring a systems approach to optimize availability of services, ensure capacity and facilitate access to the right level of care based on patient needs. This would include consideration of early supported discharge, inpatient and community-based programming (home based and outpatient). In 2019/20, approximately 50% of stroke patients accessed post-acute rehabilitation (inpatient and/or home-based). Additional data is required to fully understand system capacity and access to post-acute services. Currently, there is no standardized provincial system to capture the number of stroke patients that access outpatient rehabilitation services. Furthermore, home-based rehabilitation provided by hospitals is not captured in the homecare database (HCD). Rehabilitation intensity is an area for improvement in the inpatient rehabilitation setting. Many patients did not receive the recommended 180 minutes per day of direct therapy[4], with a current provincial performance at only 69 minutes per day.

Secondary Prevention

Secondary stroke prevention is aimed at reducing the risk of stroke recurrence after a TIA or stroke. Approximately 80% of stroke patients discharged from the emergency department are referred to secondary prevention services, with some hospitals in 2019/20 referring 100% of their TIA/stroke patients to these services. However, even if patients are referred to secondary prevention clinics, lack of stroke prevention clinic data prevents full assessment of access (i.e., if patients went to the secondary prevention clinics) and outcomes associated with secondary prevention services.

Overall Performance

Summary

Overall, the results demonstrate that the quality of stroke care in Ontario, and the associated outcomes, continue to incrementally improve, but not all stroke patients in the province have equitable access to quality stroke care. In summary, many individuals experiencing stroke still do not initiate their care via 911, median door to needle time is well above the target of 30 minutes[3], only 54% of stroke patients access stroke unit care and following their acute inpatient care many patients who require inpatient rehabilitation do not receive the recommended rehabilitation therapy intensity. There is also no standardized database to monitor outpatient services. Based upon these findings of limited stroke unit access and data gaps in both community stroke rehabilitation and secondary prevention clinics, the Stroke Evaluation and Quality Committee (SEQC) have identified these as provincial priority areas for the stroke system.

Improvements have been made in Ontario's stroke system, and this Report demonstrates an ongoing need for quality improvement efforts aimed at improving the monitoring and delivery of stroke care in Ontario. CorHealth will continue to collaborate with the 11 Regional Stroke Networks, the MOH, Ontario Health, and other key stakeholders to advance best practice stroke care across the province.

Stroke Care in Ontario 2019/20

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STROKE IS A MEDICAL EMERGENCY

58%
of stroke/TIA patients arrived at the emergency department by ambulance

79% of patients were referred to secondary prevention services after discharge from the emergency department*

TIME IS BRAIN

15%
of ischemic stroke patients received hyperacute therapy

12% tPA (tissue plasminogen activator) (Target: >12%)
- **45 minutes** median door-to-needle time (Target: <30 minutes)

5% EVT (Endovascular therapy)

STROKE UNIT CARE IMPROVES OUTCOMES

1.55 per 1000
Acute inpatient admission for stroke/TIA

40 hospitals in Ontario have a stroke unit

54% of stroke patients treated on a stroke unit (Target: >75%)

SECONDARY PREVENTION OF STROKE OCCURS ACROSS THE CARE CONTINUUM

8 days **
Median time from acute admission to inpatient rehabilitation

REHABILITATION OPTIMIZES RECOVERY

31%**
of patients accessed inpatient rehabilitation

- **69 minutes** per day of inpatient therapy was received per patient (Target: 180 minutes)

STROKE JOURNEY CONTINUES AFTER DISCHARGE

56 days **
Average number of days spent at home in the first 90 days after stroke

34%** received home-based rehabilitation*
- **9**** median number of visits

74% of patients aged 65 and older with atrial fibrillation filled a prescription for anticoagulant therapy within 90 days of acute care discharge*

PATIENT OUTCOMES

7% of stroke/TIA patients were readmitted within 30 days
12% of stroke/TIA patients died within 30 days
9%** of stroke patients were admitted to long-term care within 1-year post discharge

*There is currently no data available for outpatient rehabilitation and secondary prevention clinic.
** 2019/20 Q2 (YTD)

Next Steps

CorHealth continues to recommend, initiate, and support activities to improve patient access to time-dependent stroke therapies such as tissue plasminogen activator (tPA) and Endovascular Thrombectomy (EVT). In June 2021, CorHealth also released its inaugural Telestroke Report with twelve (12) key performance indicators which focused on access, timeliness, and patient outcomes. Additionally, CorHealth continues to produce biannual reporting on EVT performance indicators and will be launching performance discussions with all the EVT programs. These discussions will provide programs with the opportunity to reflect on their performance and identify current or planned quality improvement approaches.

This year, CorHealth is further embarking on two new multi-year stroke priority initiatives:

1. Improving Access to Stroke Unit Care
2. Filling Data Gaps in Community Stroke Rehabilitation and Secondary Prevention Clinics

These two priorities were identified by the Stroke Evaluation and Quality Committee (SEQC) and further endorsed by the Regional and District Advisory Committee (RDAC) and the Stroke Leadership Council, as critical undertakings to truly advance the stroke system of care and move the needle on quality and performance.

As CorHealth launches these new activities, stakeholder engagement and collaboration will remain at the forefront of our approach. CorHealth will continue to work through its governance tables, the Stroke Networks, the MOH and Ontario Health to guide meaningful change and promote a provincial standard of care that demonstrates best practice and best outcomes for patients and families affected by stroke.

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Indicator Results

Indicators

Indicators

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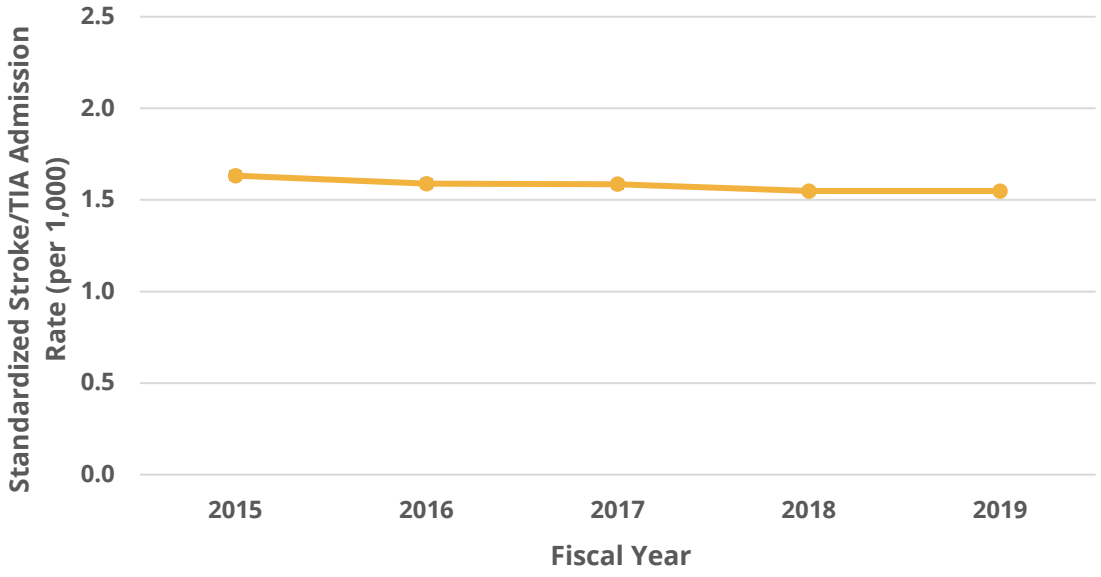
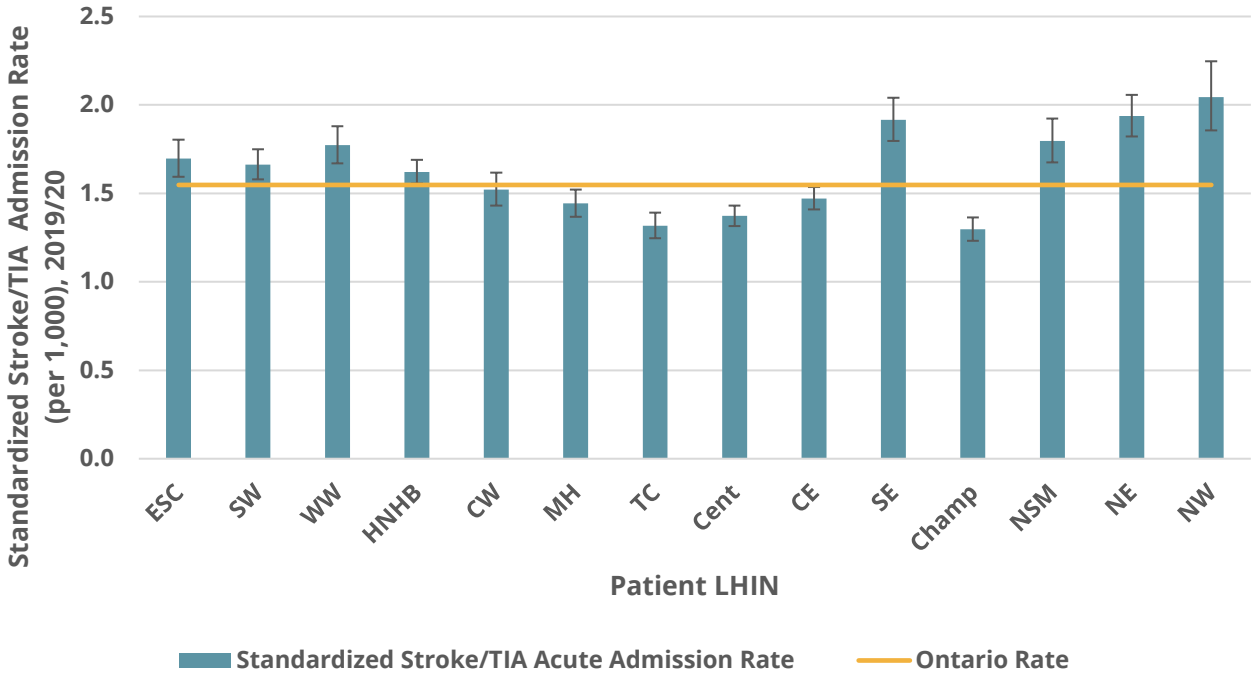
Chapter 1: Prevention & Public Awareness of Stroke and Transient Ischemic Attack (TIA)

Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario
Indicator 1.1: Standardized Stroke and TIA Admission Rate to Acute Inpatient Care (per 1,000), FY 2019/20

Indicator Description:

The population rate of admission to hospital for stroke & transient ischemic attack (TIA) reflects several factors including the effectiveness of primary and secondary prevention efforts such as control of hypertension and smoking cessation programs. The cohort for this indicator is the Ontario adult population in the Registered Persons Database (RPDB). Ontario and LHIN performance are directly standardized to the 2019 RPDB population age and sex profile.





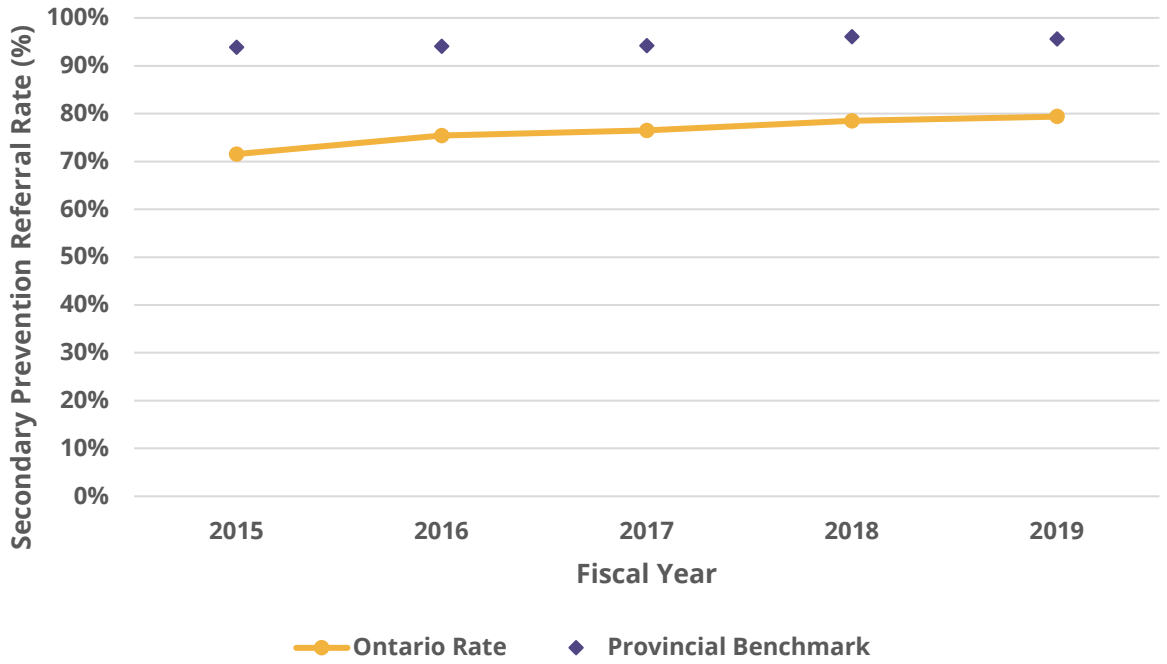
Interpretation Consideration:

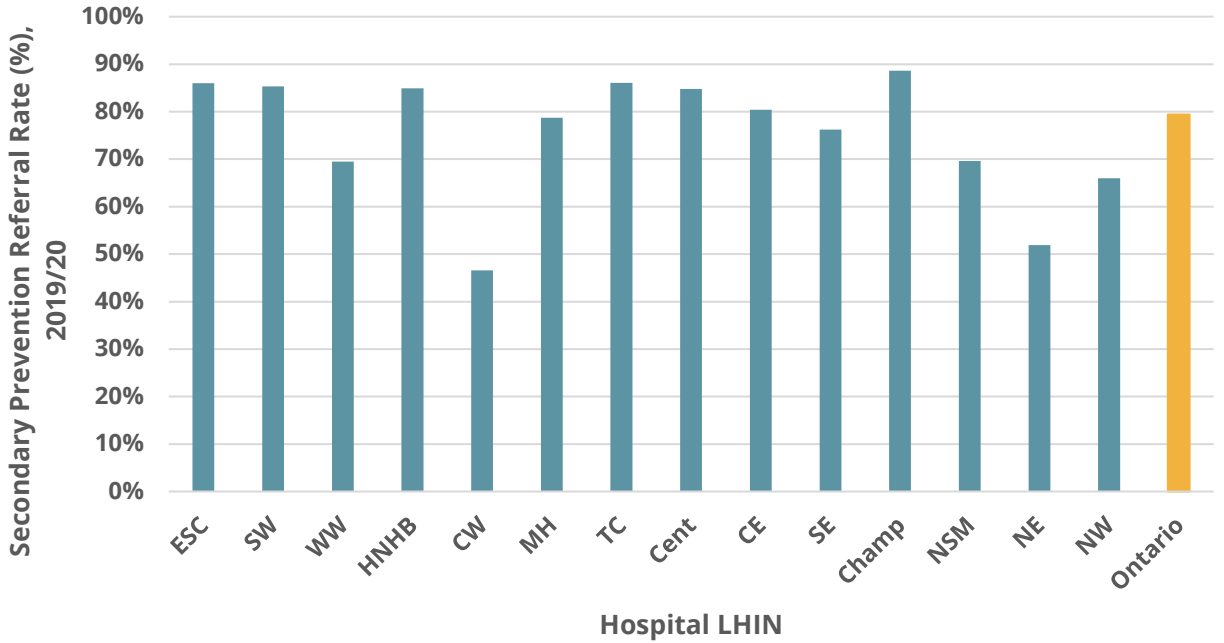
Desired directionality is lower. There is very little movement in the Ontario rate between fiscal years 2015/16 to 2019/20. There is variation between the LHINs in fiscal year 2019/20 with a range of 1.3 per 1,000 (TC LHIN) to 2.0 per 1,000 (NW LHIN). Only the first (index) stroke is each fiscal year is included. Factors that may contribute to the LHIN variation observed may be reflective of geographic nuances with respect to social determinants of health and health resource equity.

Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario
Indicator 1.2: Secondary Prevention Referral Rate of Stroke & TIA Patients Discharged from the Emergency Department, FY 2019/20

Indicator Description:

Proportion of ischemic stroke and transient ischemic attack (TIA) patients discharged from the emergency department (ED) who were referred to secondary prevention services (query stroke/TIA are excluded).





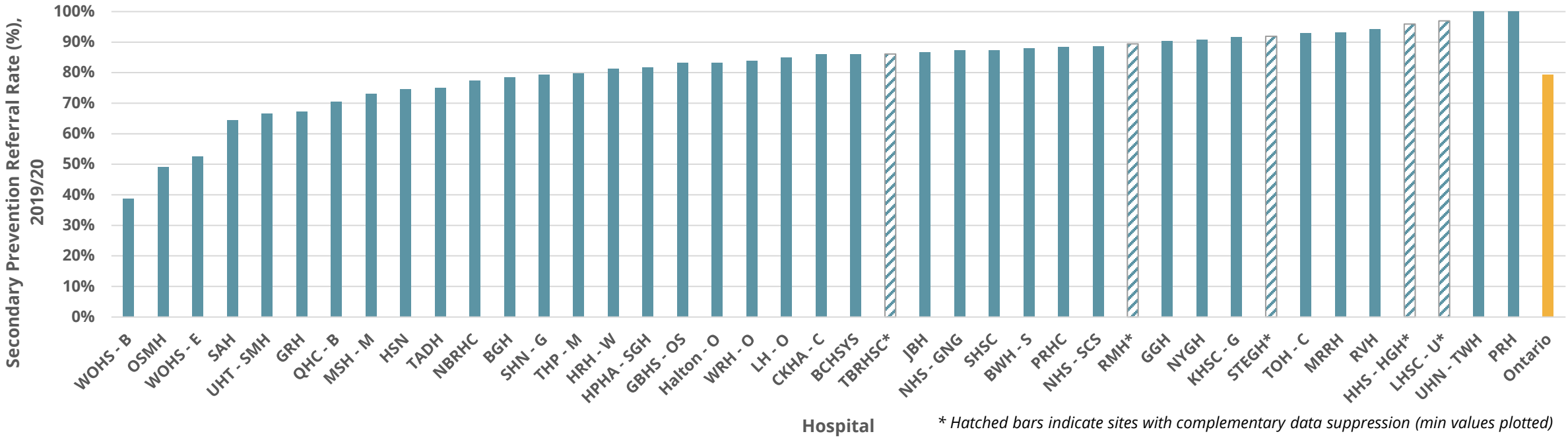
Interpretation Consideration:

Desired directionality is higher. Provincial rates are steadily increasing from 72% (2015/16) to 79% (2019/20). There is wide variation in the LHIN rates where half the LHINs are achieving values of 80% or more. The limitation with this metric is, although patients are referred to a secondary prevention clinics, lack of stroke prevention clinic data prevents full assessment of access (i.e., if patients went to the secondary prevention clinics) and outcomes associated with secondary prevention services.

Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario
Indicator 1.2: Secondary Prevention Referral Rate of Stroke & TIA Patients Discharged from the Emergency Department, FY 2019/20

Indicator Description:

Hospital Level Results. Proportion of ischemic stroke and transient ischemic attack (TIA) patients discharged from the emergency department (ED) who were referred to secondary prevention services (query stroke/TIA are excluded).



** Hatched bars indicate sites with complementary data suppression (min values plotted)*

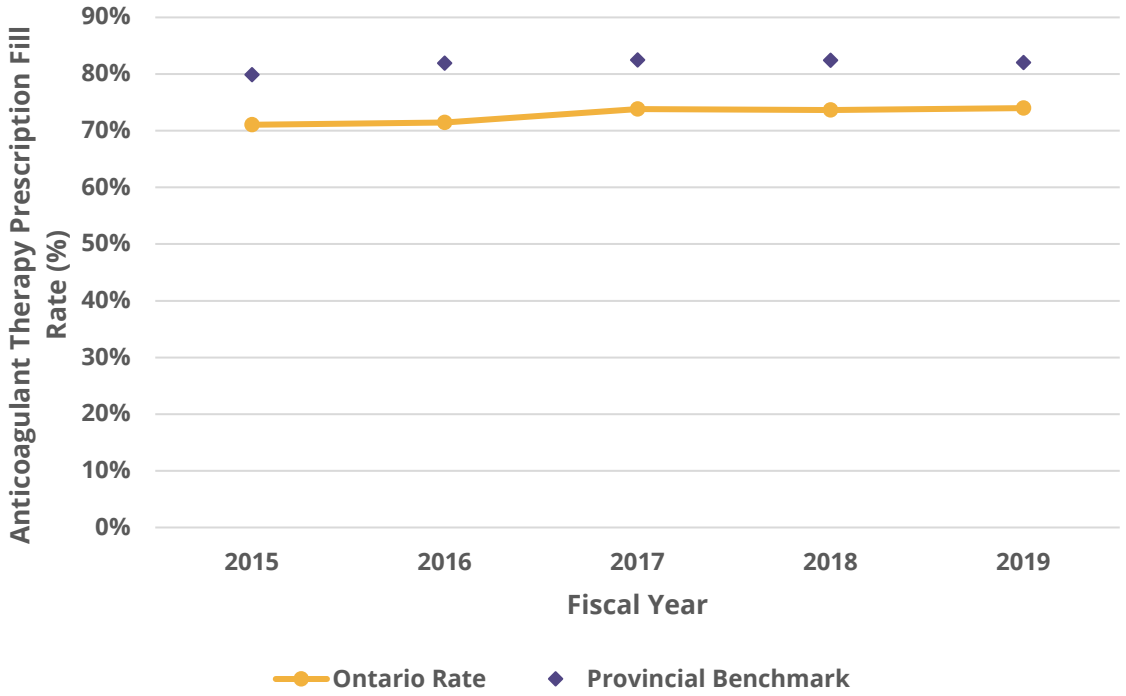
Interpretation Consideration:

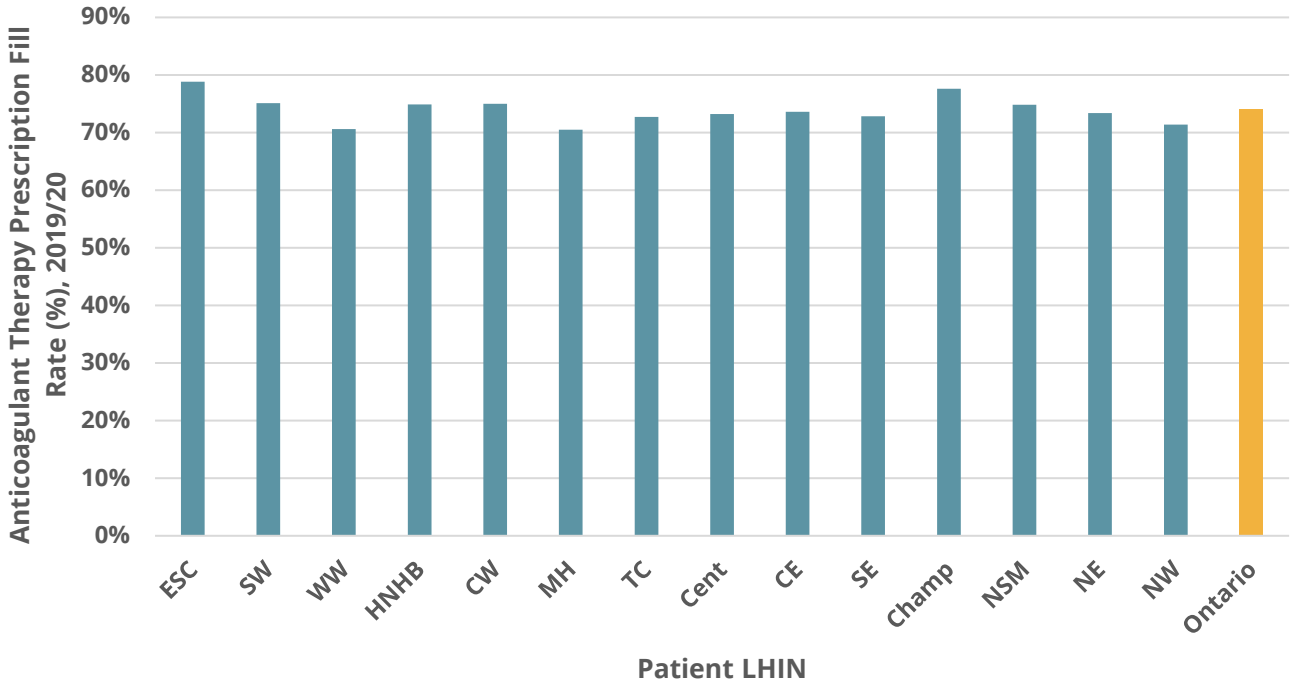
Desired directionality is higher. Most of the sites have a rate of 80% or greater for referral to secondary prevention services. The referral rate of secondary prevention services ranges from 39% (WOHS-B) to 100% (UHN-TWH and PRH). The limitation with this metric is, although a patient is referred to a secondary prevention clinic, it is not known whether the patient received services due to a lack of data availability. Additionally, patients discharged from the ED with an unknown diagnosis, may not be captured in the data, and may not be referred yet still be at risk of stroke.

Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario
Indicator 1.3: Proportion of Ischemic stroke/TIA inpatients aged 65+ with Atrial Fibrillation who Filled a Prescription for Anticoagulant Therapy within 90 days of Discharge from Acute Care, FY 2019/20

Indicator Description:

For long-term stroke prevention, most people with atrial fibrillation should be treated with an anticoagulant. This indicator focuses on the population age 65 and older with atrial fibrillation who filled a prescription for an oral anticoagulant therapy within 90 days of discharge from acute stroke care. The cohort focuses on patients with a history of atrial fibrillation (in the past three years) and does not capture patients with a diagnosis of atrial fibrillation after discharge.





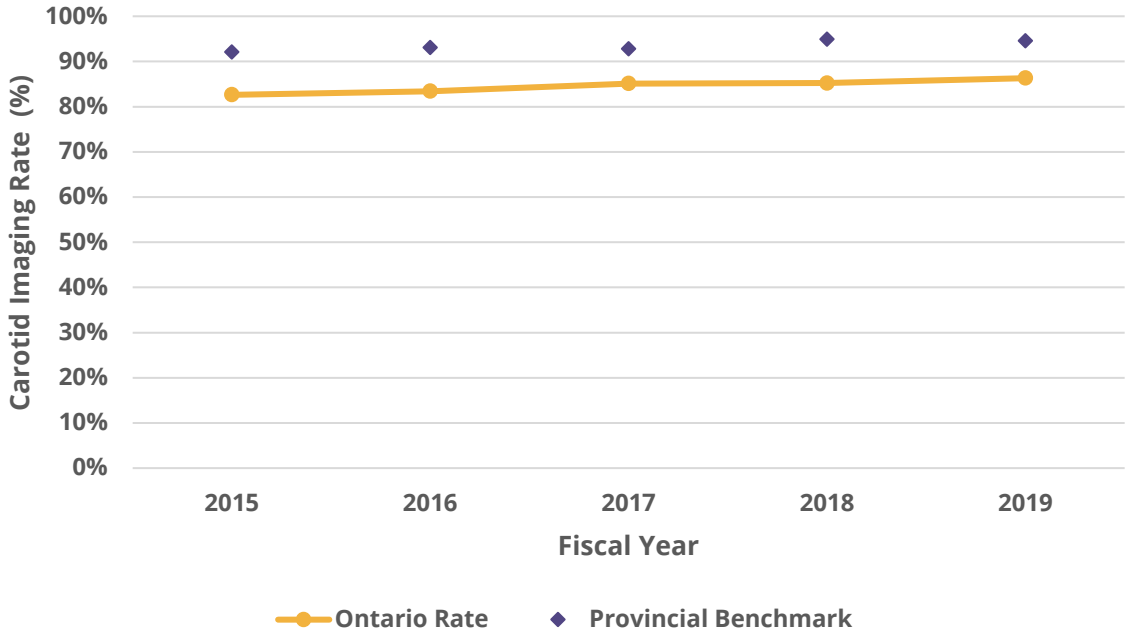
Interpretation Consideration:

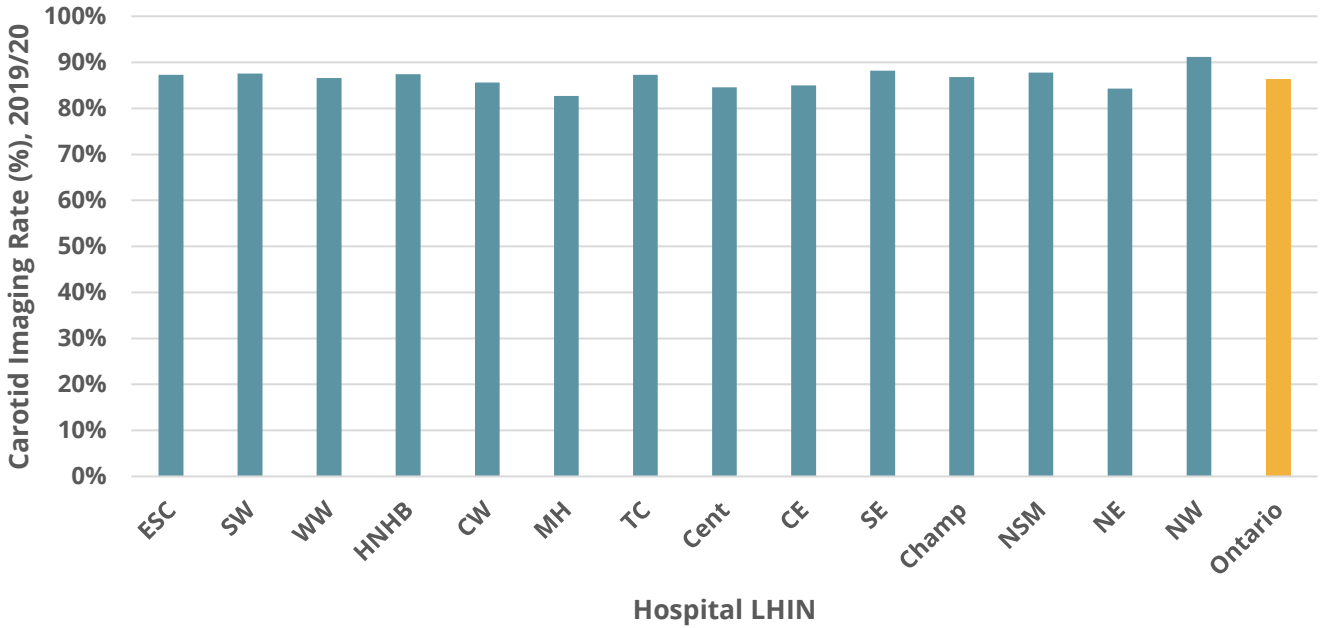
Desired directionality is higher. The rate of filling a prescription for anticoagulant therapy has remained steady for the last three fiscal years. Prescription drug information data are only available for those 65 years and older and who filled the prescription using the Ontario Drug Benefit plan. An integrated care approach that focuses on diagnosis, education and behaviour modification with health care providers and patients is required to optimize anticoagulant use as a prevention strategy for stroke.

Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario
Indicator 1.4: Carotid Imaging Rate for Ischemic Stroke Admission to Acute Care, FY 2019/20

Indicator Description:

The proportion of acute ischemic stroke patients who received any one of the following carotid imaging procedures during their inpatient stay: carotid Doppler, carotid computed tomography angiography (CTA), carotid magnetic resonance angiography (MRA) or carotid angiography.





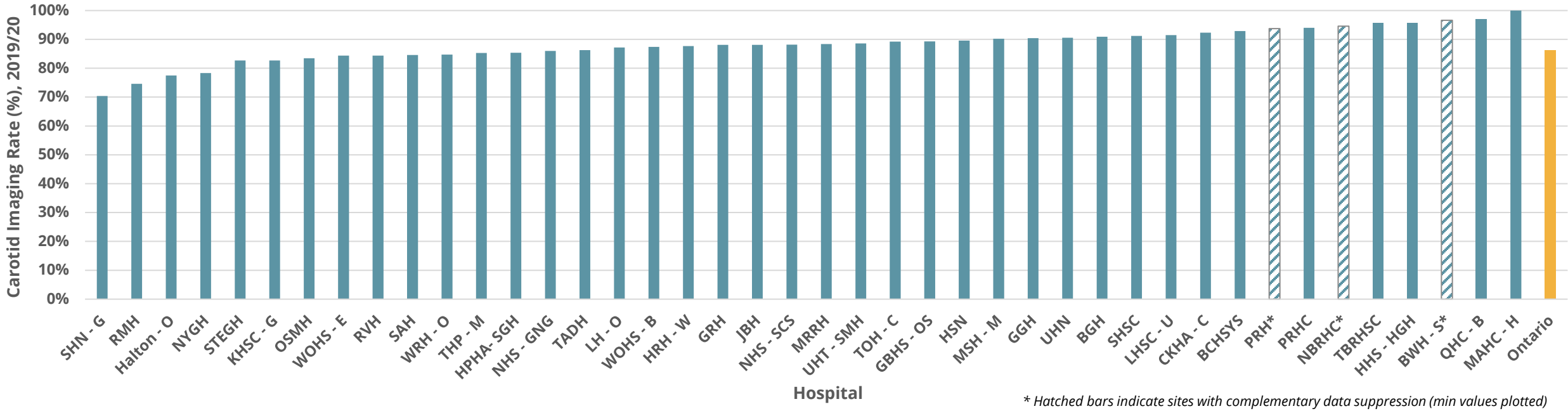
Interpretation Consideration:

Desired directionality is high. All LHINs achieved rates greater than 80%, with NW LHIN achieving greater than 90%. Coding for carotid imaging is optional in the DAD dataset but mandatory in NACRS dataset, therefore data capture may be contributing to the variation observed.

Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario
Indicator 1.4: Carotid Imaging Rate for Ischemic Stroke Admission to Acute Care, FY 2019/20

Indicator Description:

Hospital Level Results. The proportion of acute ischemic stroke patients who received any one of the following carotid imaging procedures during their inpatient stay: carotid Doppler, carotid computed tomography angiography (CTA), carotid magnetic resonance angiography (MRA) or carotid angiography.



** Hatched bars indicate sites with complementary data suppression (min values plotted)*

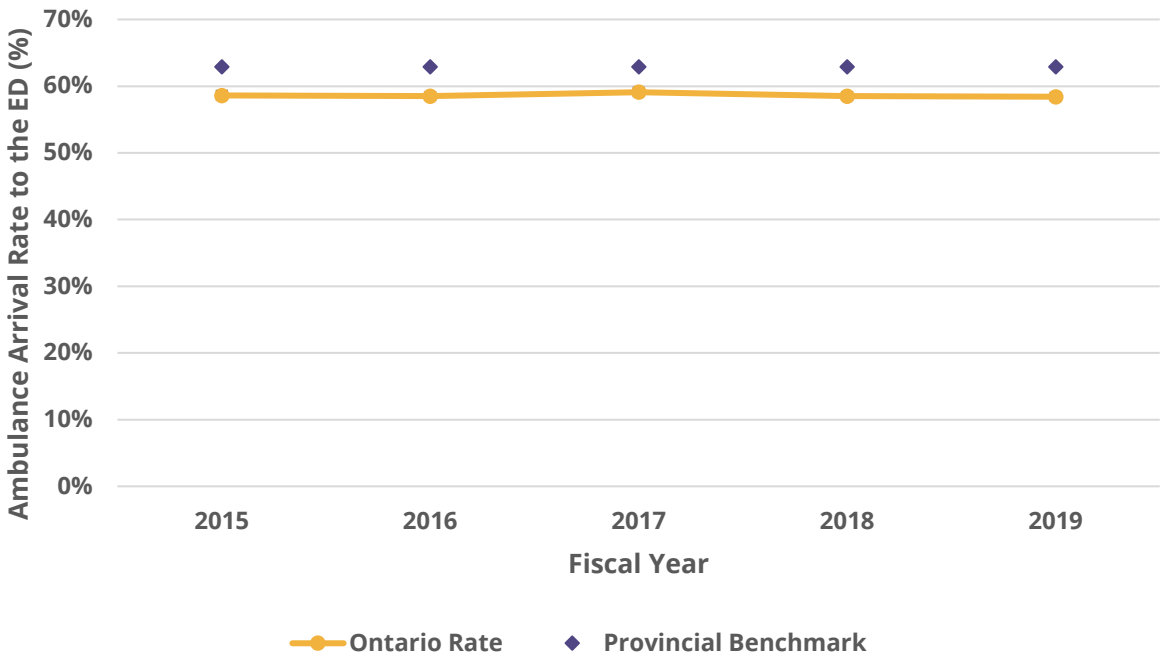
Interpretation Consideration:

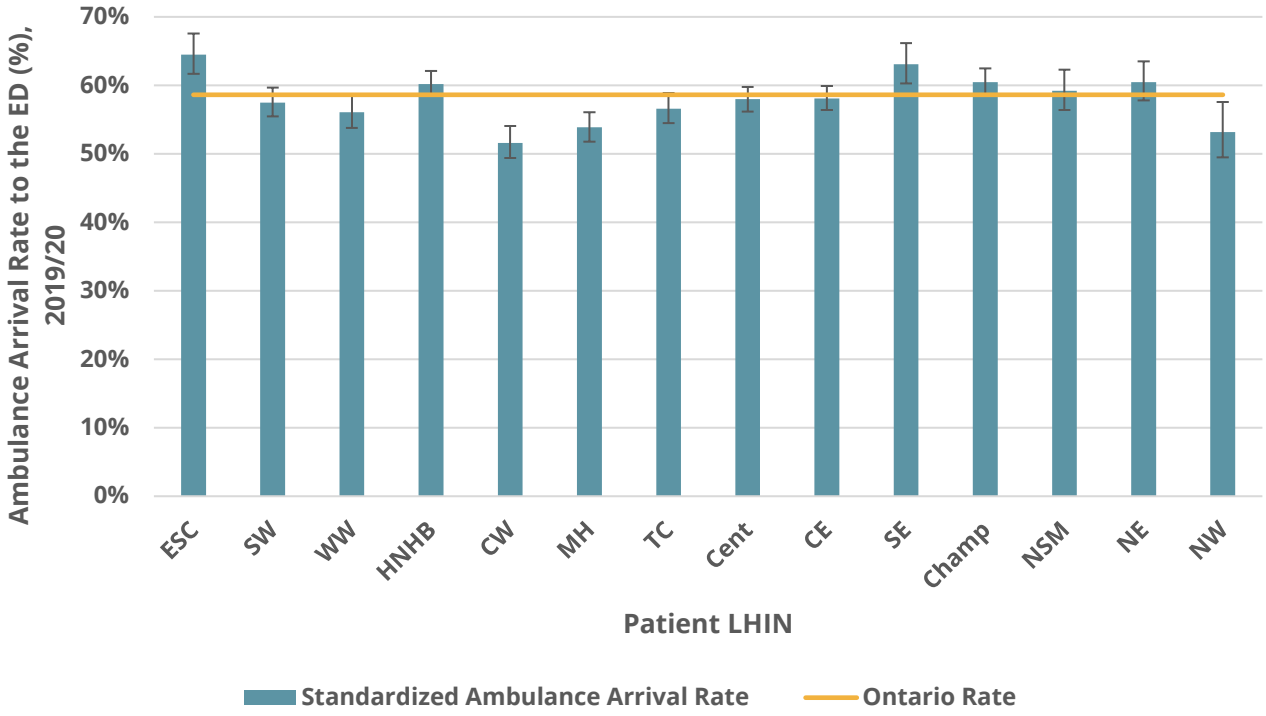
Desired directionality is high. Carotid imaging rate ranges from 70% (SHN-G) to 100% (MAHC-H). Coding for carotid imaging is optional in the DAD dataset but mandatory in NACRS dataset, therefore data capture may be contributing to the variation observed.

Chapter 1: Prevention and Public Awareness of Stroke and TIA in Ontario
Indicator 1.5: Standardized Ambulance Arrival Rate to the Emergency Department for Stroke & TIA Patients, FY 2019/20

Indicator Description:

The rate that stroke/TIA patients arrived by ground, or a combination of ground and air ambulance to the emergency department (ED). This indicator is standardized for stroke type.





Interpretation Consideration:

Desired directionality is high. Ambulance arrival rates to the ED has remained relatively the same for the last five fiscal years. In 2019/20, ESC and SE LHIN were the only LHINs that were statistically higher than the Ontario rate. All stroke regions have ambulance protocols that facilitate access to specialized stroke hospitals. Public awareness that focuses on recognizing the signs and symptoms of stroke and the importance of calling 911, is critical to influence ambulance use.

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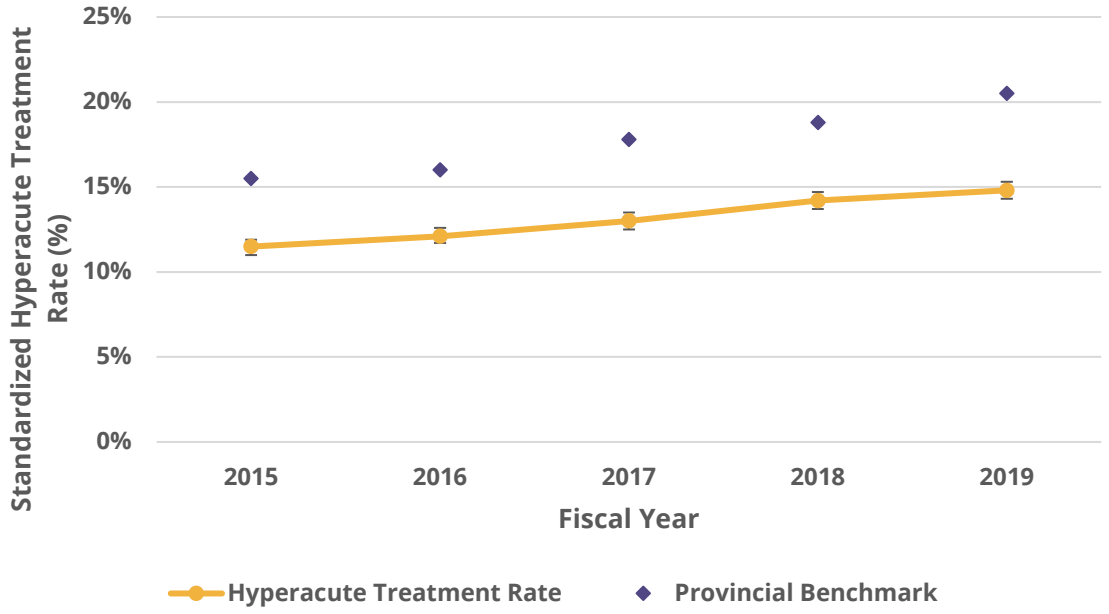
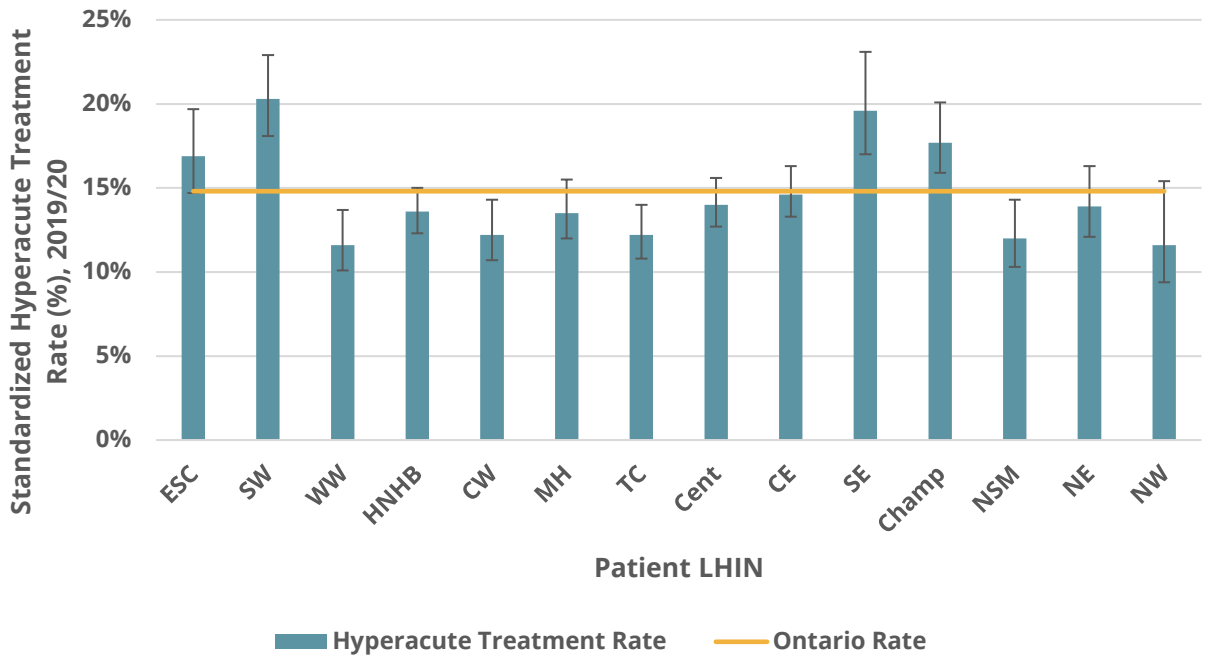
Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.1.1: Standardized Hyperacute Treatment Rate (tPA and/or EVT), FY 2019/20

Indicator Description:

This indicator measures the rate of ischemic stroke patients who received hyperacute therapy which includes endovascular thrombectomy (EVT) and/or tissue plasminogen activator (tPA). The indicator is standardized for type II (i.e., in-hospital stroke) stroke diagnosis and whether ischemic stroke was the MRDx.





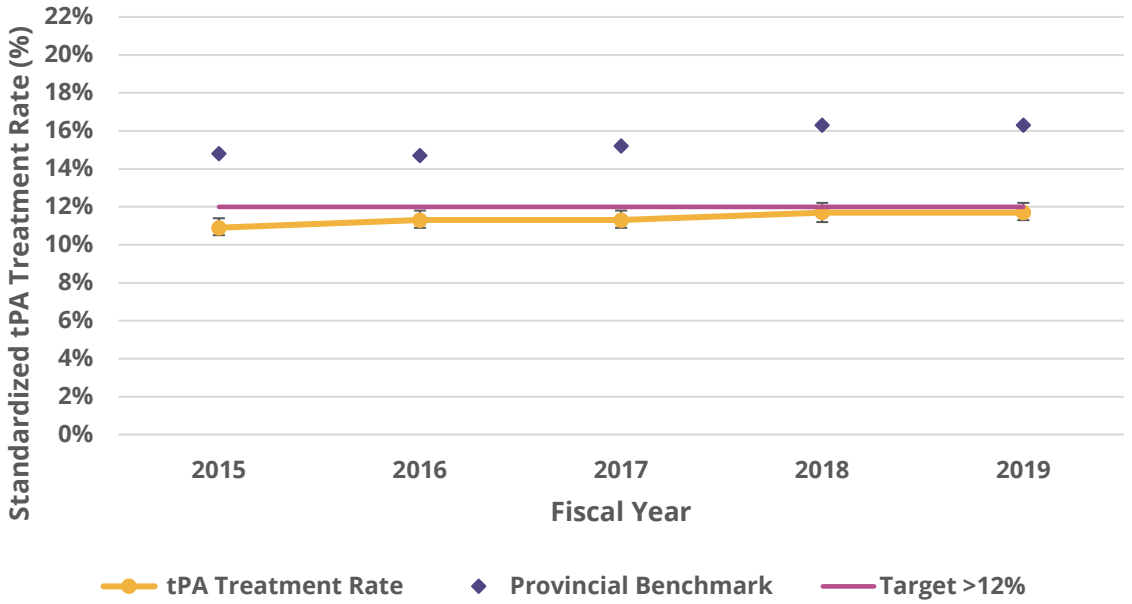
Interpretation Consideration:

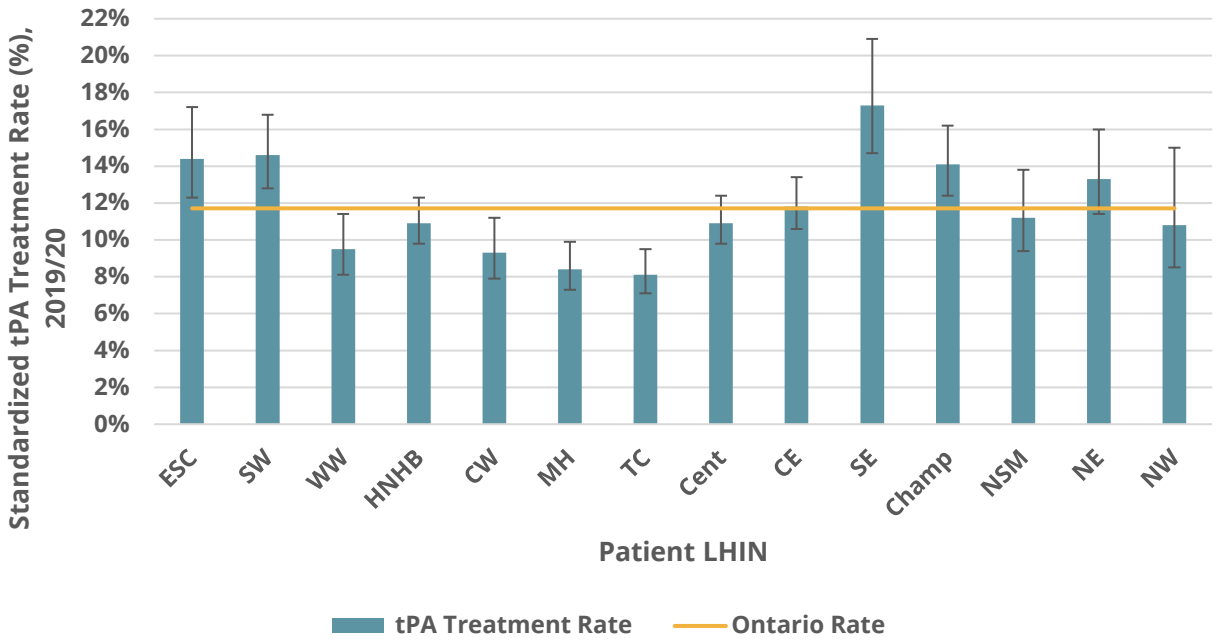
Desired directionality is high. With the introduction of EVT, hyperacute treatment rates have been steadily increasing in the last five fiscal years. There is variability in access to hyperacute treatment in the province, with a range of 11.6% (WW and NW) to 20.3% (SW). Hyperacute treating centres will need to continue to optimize regional access.

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.1.2: Standardized tPA Rate, FY 2019/20

Indicator Description:

This indicator measures the rate of ischemic stroke patients who received tissue plasminogen activator (tPA). The indicator is standardized for type II (i.e., in-hospital stroke) stroke diagnosis and whether ischemic stroke was the MRDx. Target is >12%[5]





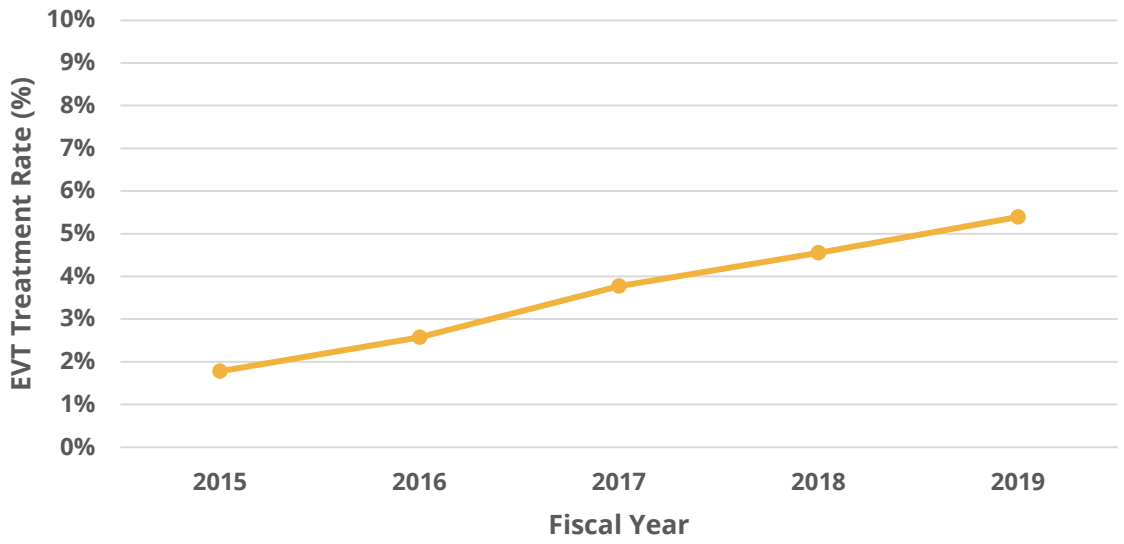
Interpretation Consideration:

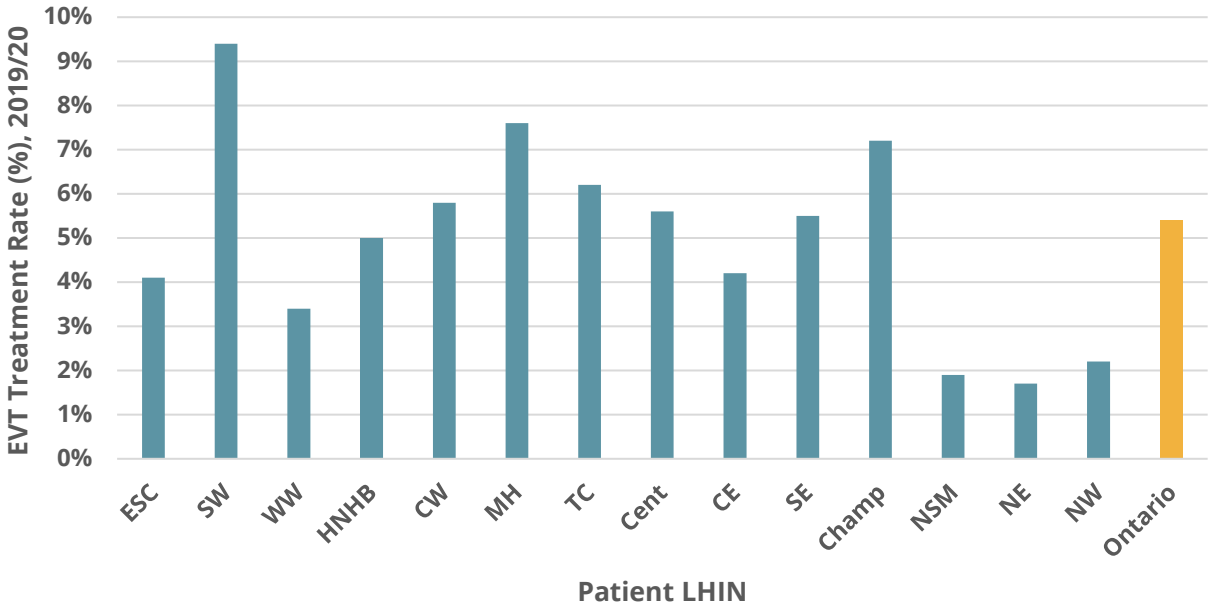
Desired directionality is high. Provincial access to tPA has remained the same for the last two fiscal years. WW, CW, MH and TC LHIN's tPA treatment rate is statistically below the provincial rate. LHIN performance may be influenced by the level of organized stroke care and patient behaviour (e.g., delays in seeking medical attention). Regions need to take into consideration pre-hospital and other emergency factors that may be influencing results.

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.1.3: EVT Treatment Rate, FY 2019/20

Indicator Description:

This indicator measures the rate of ischemic stroke patients who received endovascular thrombectomy (EVT) therapy.





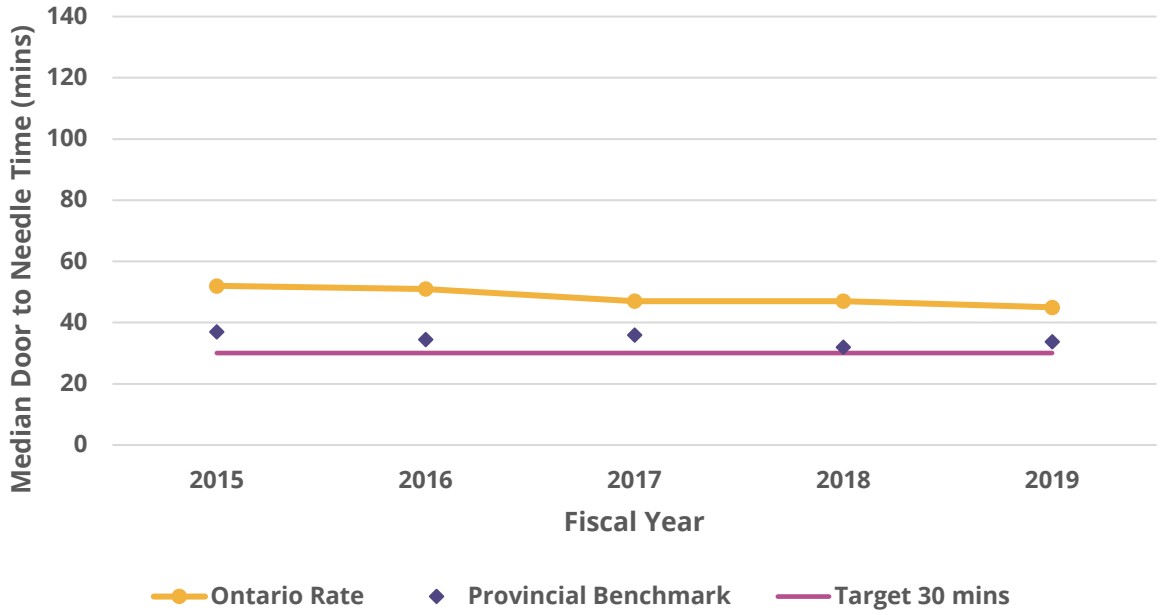
Interpretation Consideration:

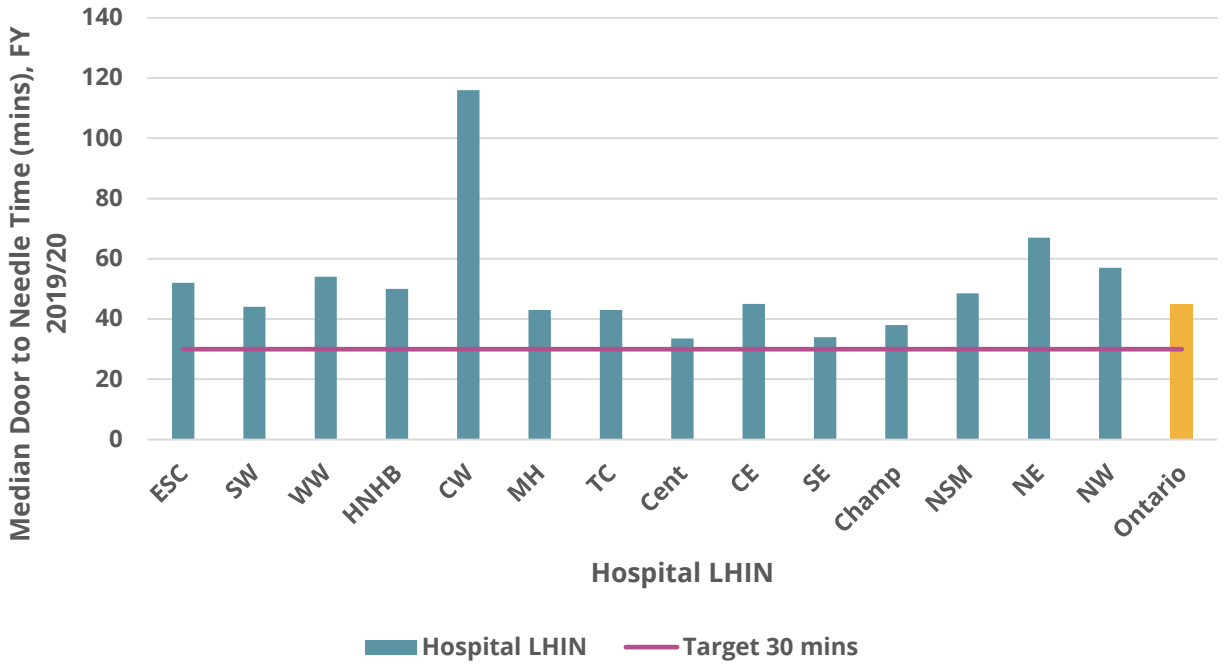
Desired directionality is high. The provincial EVT treatment rate has had considerable growth in the past five fiscal years, from 1.8% in 2015 to 5.4% in 2019; however, there is wide variation in access to EVT treatment in the LHINs ranging from 1.7% (NE) to 9.4% (SW). Regions should continue to work with partner organizations to optimize access to this treatment. The expansion of the EVT treatment window will assist growth in access, particularly for those living at greater distances from EVT centres.

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.2: Median Door-to-Needle Time for tPA Treatment (mins), FY 2019/20

Indicator Description:

The time, in minutes, between a stroke patient's emergency department (ED) door time and the time thrombolysis with tissue plasminogen activator (tPA) was administered is referred to as door-to-needle (DTN) time. The target median door to needle time is 30 minutes.[3]





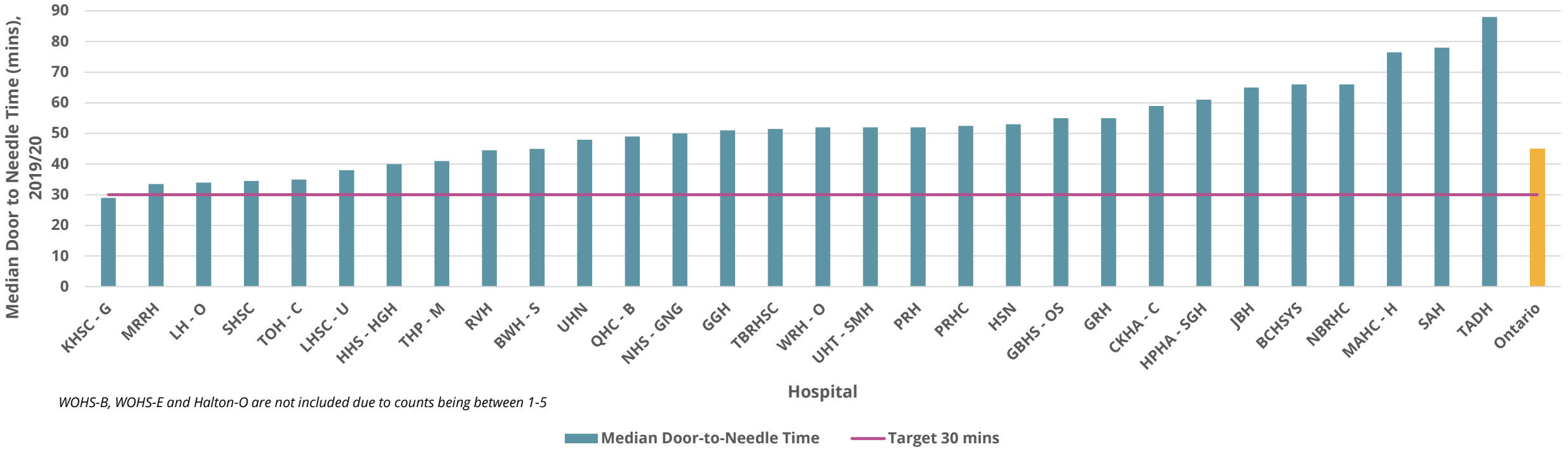
Interpretation Consideration:

Desired directionality is low. Start of the ED door time is defined as ED triage or ED registration time (which ever comes first). Provincially median door-to-needle time has improved (declined) from 52 mins in 2015 to 45 mins in 2019; however, variability across regions remains. None of the LHINs achieved the target of 30 minutes, and the range among the LHINs was 34 minutes (Cent and SE) to 116 minutes (CW).

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.2: Median Door-to-Needle Time for tPA Treatment (mins), FY 2019/20

Indicator Description:

Hospital Level Results. The time, in minutes, between a stroke patient's emergency department (ED) door time and the time thrombolysis with tissue plasminogen activator (tPA) was administered is referred to as door-to-needle (DTN) time. The target median door to needle time is 30 minutes.[3]



WOHS-B, WOHS-E and Halton-O are not included due to counts being between 1-5

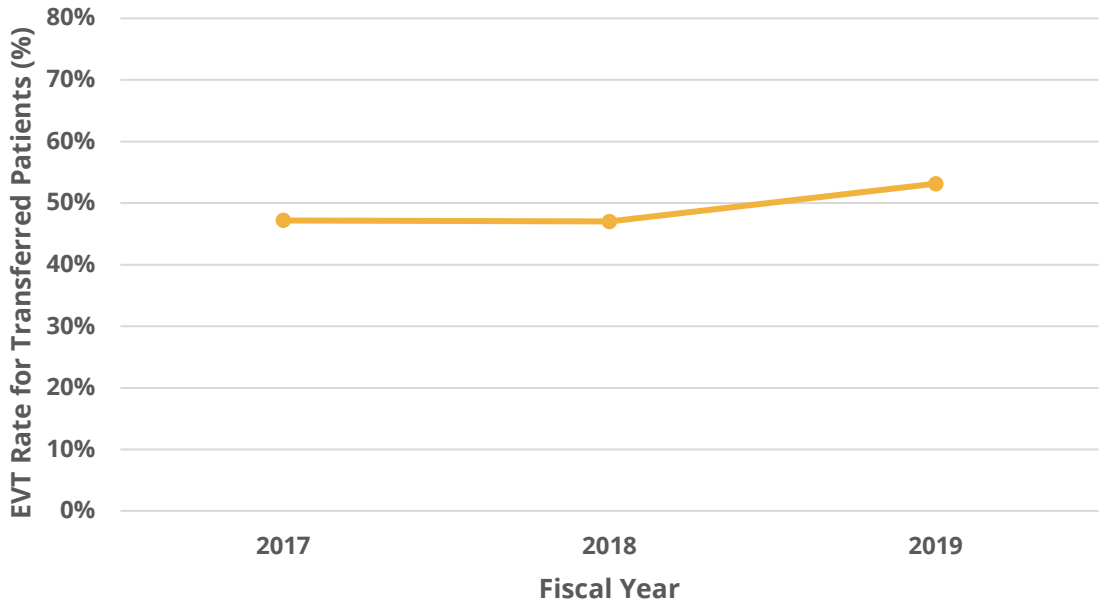
Interpretation Consideration:

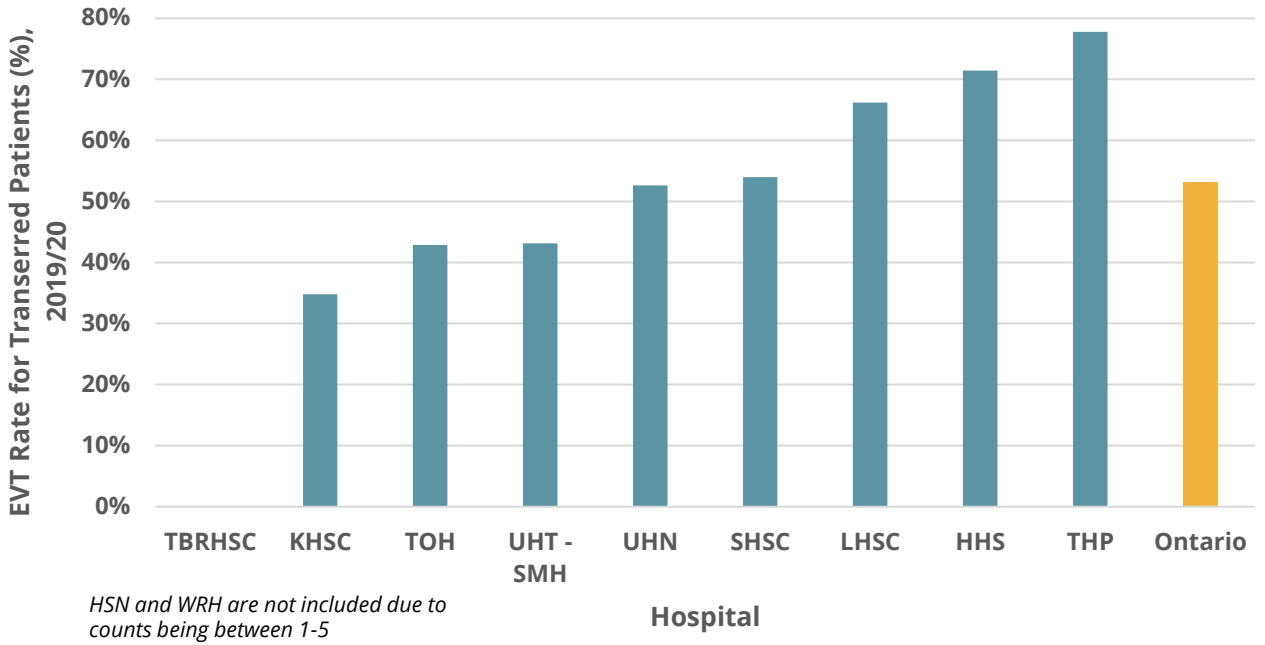
Desired directionality is low. Start of the ED door time is defined as ED triage or ED registration time (which ever comes first). KHSC-G was the only hospital that achieved target time. Median door-to-needle time ranges from 29 minutes (KHSC–G) to 88 minutes (TAGH). Hospitals should be reviewing their processes of care to drive quality improvement on access to this time dependent treatment.

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.3: EVT Rate for Ischemic Stroke Patients Transferred From a District Stroke Centre (DSC) or tPA Hospital ED to an EVT Hospital, FY 2019/20

Indicator Description:

This indicator measures the rate of EVT treatment of ischemic stroke patients that were transferred from the Emergency Department of a District Stroke Centre (DSC) or tPA hospital to an EVT capable hospital.





HSN and WRH are not included due to counts being between 1-5

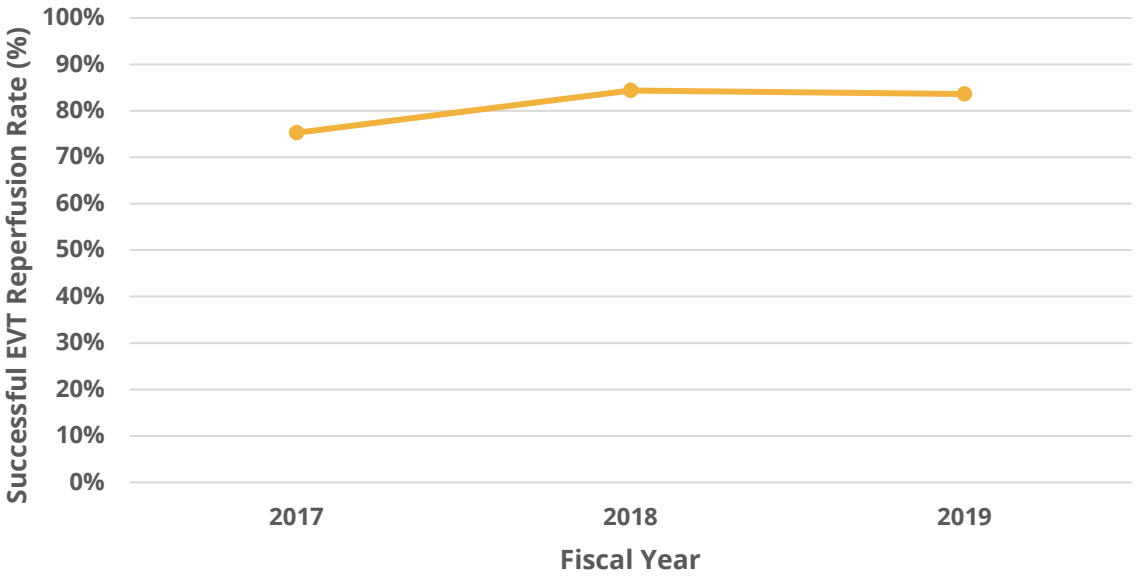
Interpretation Consideration:

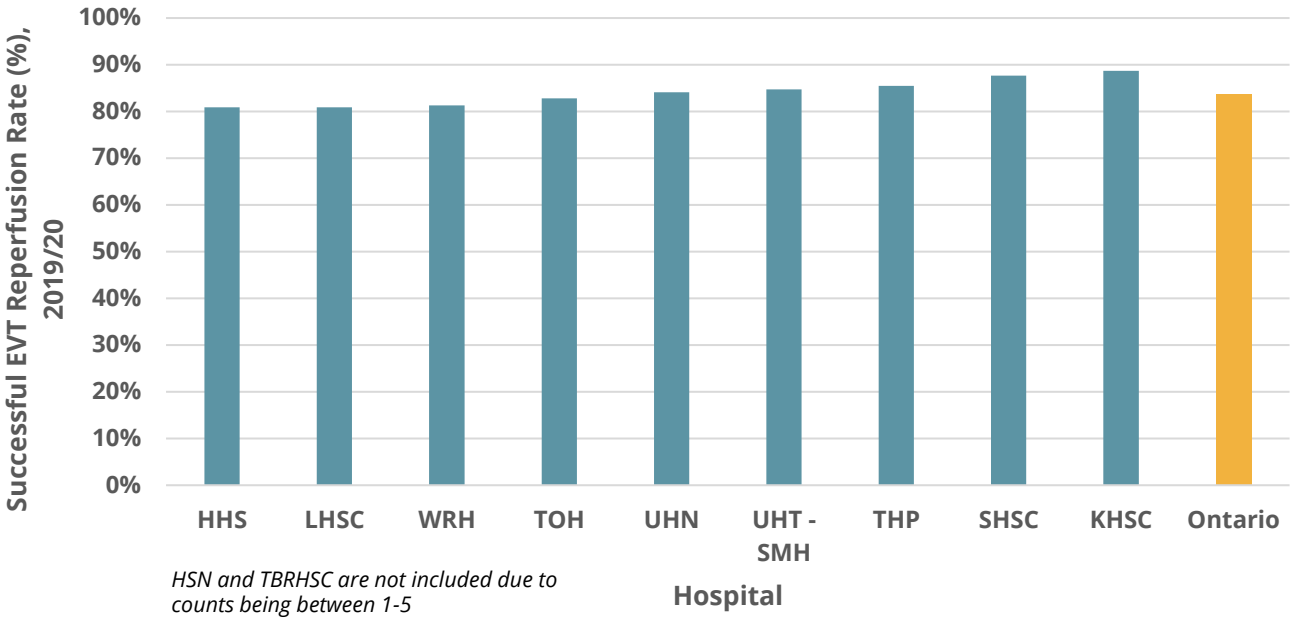
Desired directionality is high. This indicator does not include transfers of inpatients and is limited to patients with an ischemic stroke diagnosis criteria for the ED record at the DSC/tPA hospital. Patients who are transferred to an EVT site are considered to be transferred for EVT, and it is possible that transfers may be for reasons other than EVT (e.g., stroke unit care).

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.4: Successful Reperfusion Rate for Patients that Received EVT, FY 2019/20

Indicator Description:

Percentage of EVT patients with a thrombolysis in cerebral infarction score (TICI score) of 2b or 3 documented at the conclusion of the EVT procedure.





HSN and TBRHSC are not included due to counts being between 1-5

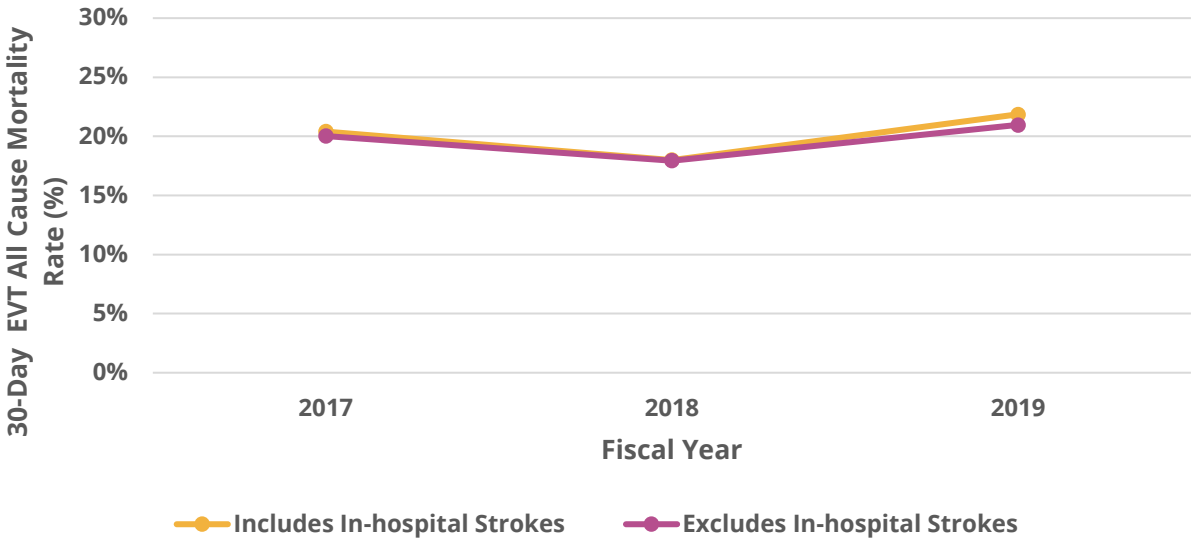
Interpretation Consideration:

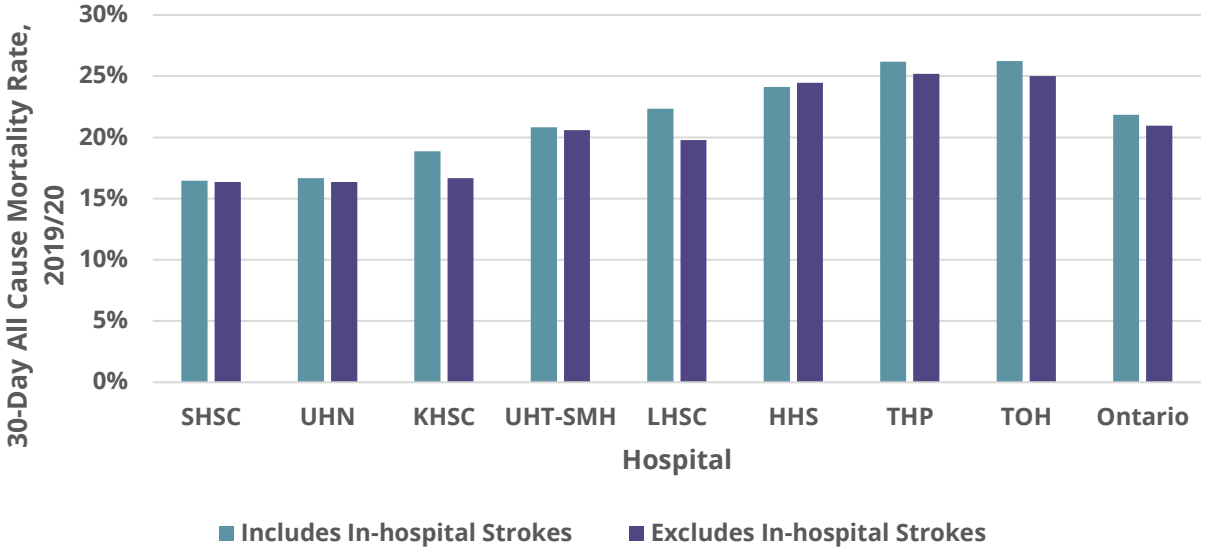
Desired directionality is high. All EVT hospitals had a successful reperfusion rate of 80% or greater in 2019/20. EVT reperfusion rates align with, or in some instances are better than those reported in the literature.[6-8]

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.5: 30-Day All Cause Mortality Rate of Patients that Received an EVT, FY 2019/20

Indicator Description:

The 30-Day all cause mortality following EVT is a crude performance indicator. The cohort includes all ischemic stroke patients that had an EVT procedure and is stratified by including or excluding those who experience stroke while in-hospital stroke.





HSN, TBRHSC and WRH are not included due to counts being between 1-5

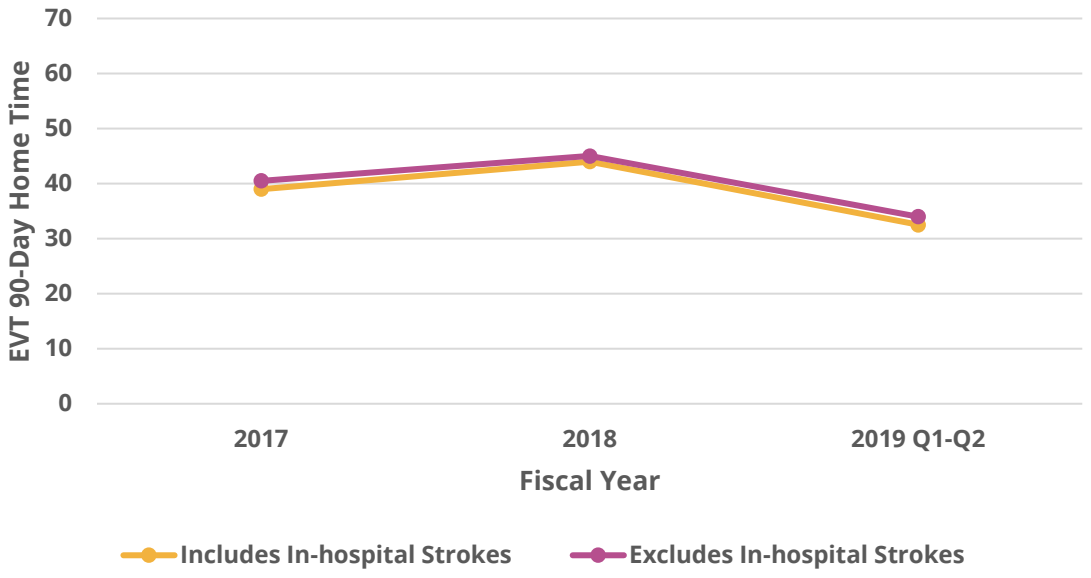
Interpretation Consideration:

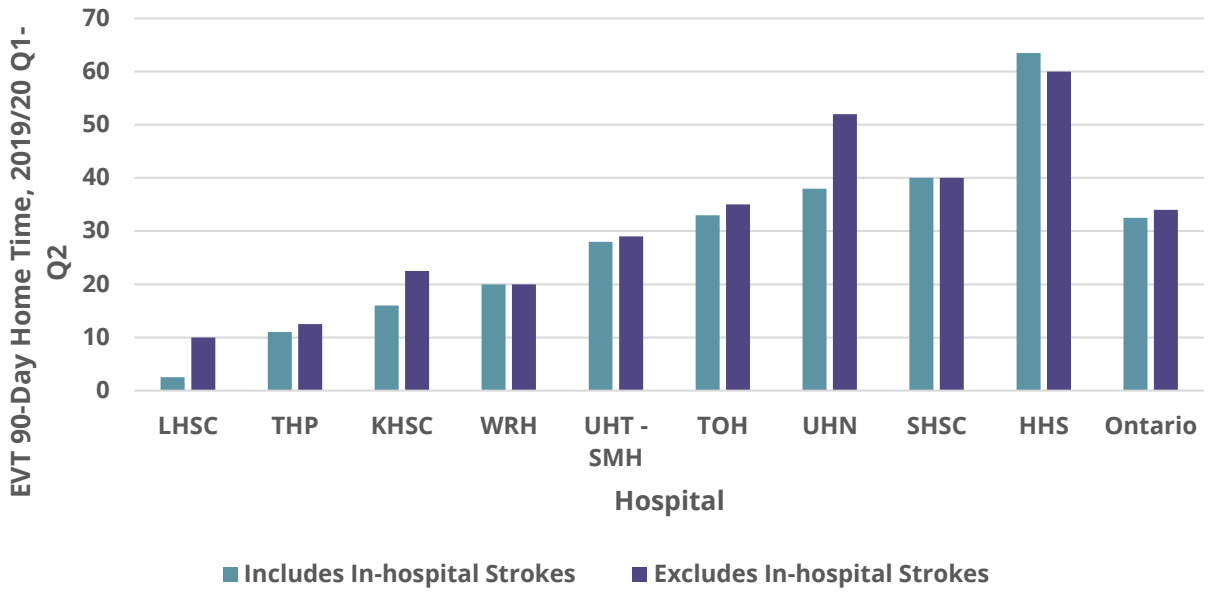
Desired directionality is low. The indicator is not risk adjusted; hence, patient characteristics such as age, stroke severity, and comorbidities may contribute to the observed variation year over year. Mortality rates align with or are slightly higher than those reported in the literature. [6-8]

Chapter 2: Hyperacute Care Access and Outcomes for Ischemic Stroke
Indicator 2.6: Median Days at Home in the First 90-Days Following EVT, FY 2019/20 Q1-Q2

Indicator Description:

The number of days an EVT patient spent alive and outside of a health institution (hospital, inpatient rehab and/or skilled nursing facility) in the first 90 days after the EVT hospitalization and is stratified by including or excluding those who experience stroke while in-hospital stroke.





TBRHSC are not included due to counts being between 1-5 HSN did not have their EVT program during this reporting period.

Interpretation Consideration:

Desired directionality is high. Factors that contribute to lower days at home include: zero home time; in-hospital mortality; admission to CCC, LTC, or to inpatient rehabilitation versus home rehabilitation; ALC LOS; readmission and post discharge mortality. This creates a composite indicator of performance. This measure is used as a proxy for the Modified Rankin Scale, a measure of the degree of disability for patients' post-stroke.[9] A limitation to this indicator is the inability to determine the level of assistance a patient requires, and the access/availability of social/community supports in order to keep the patient home.

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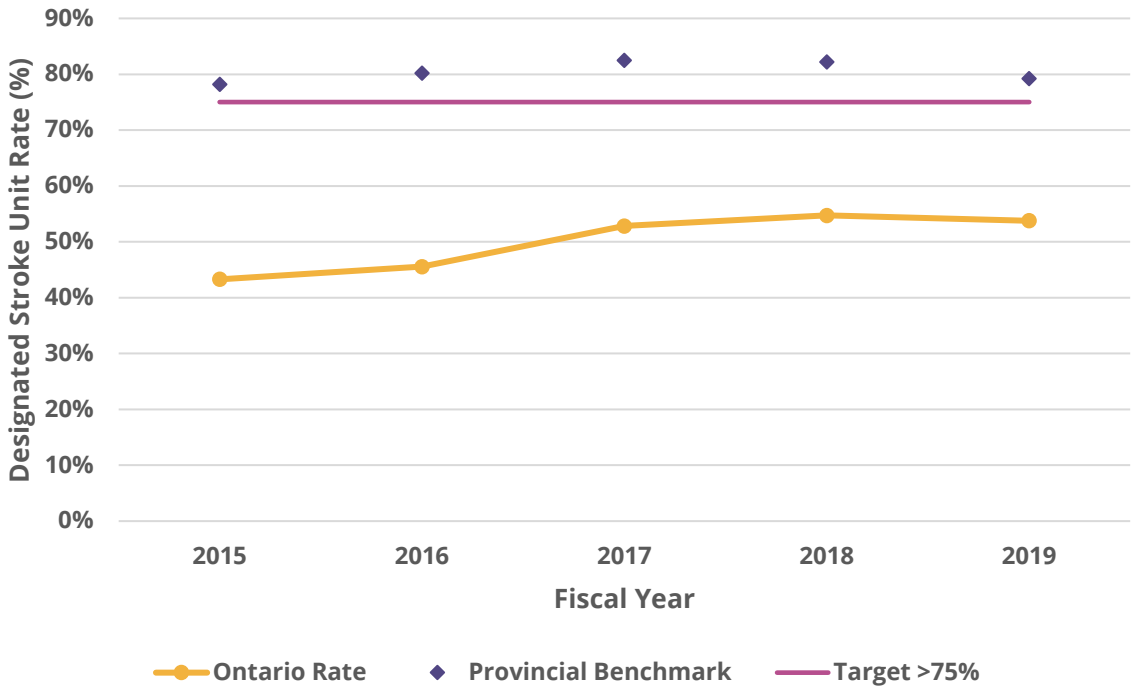
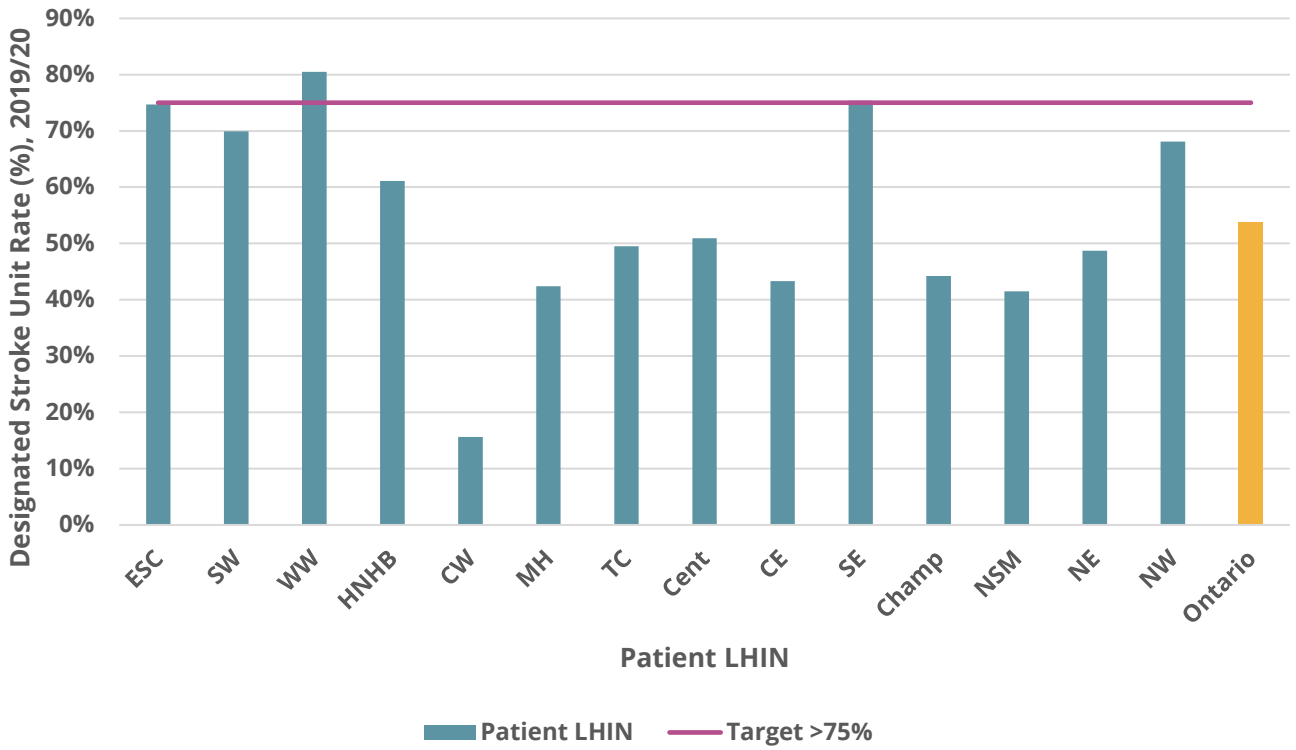
Chapter 3: Acute Care Access and Outcomes for Stroke and TIA

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.1: Designated Stroke Unit Rate for Stroke/TIA Acute Patients, FY 2019/20

Indicator Description:

This indicator measures the proportion of stroke/TIA patients treated in a designated stroke unit for any part of their index (first) admission. Target is >75%[3]





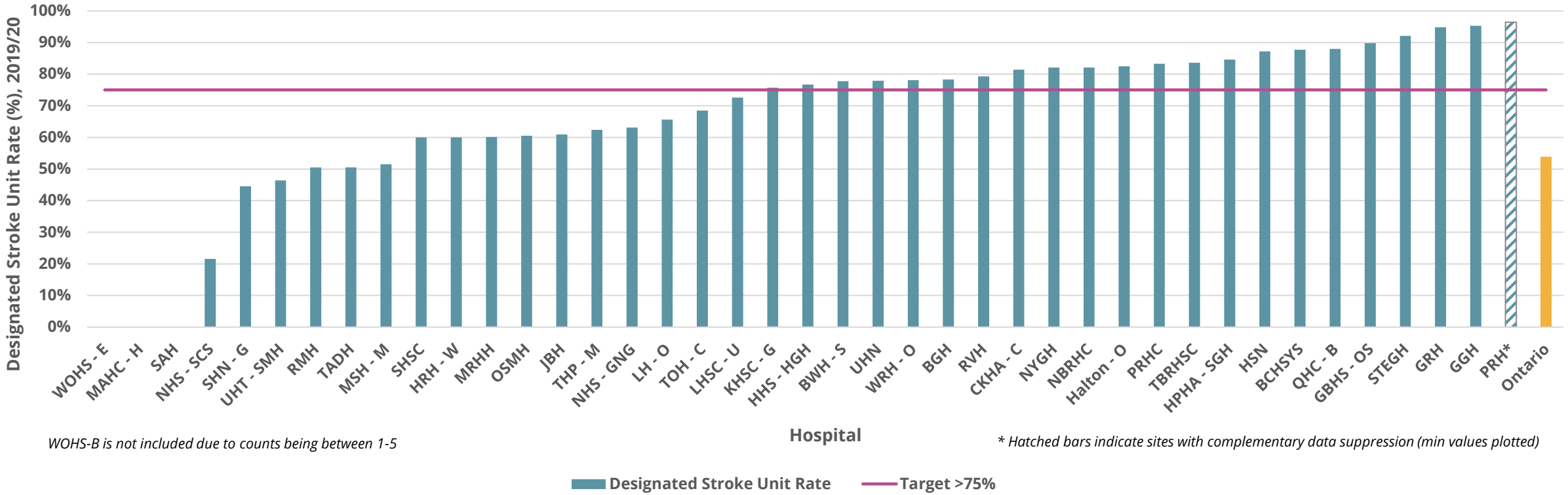
Interpretation Consideration:

Desired directionality is higher. If a patient receives stroke unit care at a non-index hospital (i.e., not the first acute hospital they were admitted to), this will not be captured in the metric. The Ontario rate of acute care treatment at a designated stroke unit decreased from 55% in 2018/19 to 54% in 2019/20. The target of >75% was achieved in the patient LHINs of WW and SE. There is geographic inequity in access to this best practice ranging from 16% (CW) to 81% (WW).

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.1: Designated Stroke Unit Rate for Stroke/TIA Acute Patients, FY 2019/20

Indicator Description:

Hospital Level Results. This indicator measures the proportion of stroke/TIA patients treated in a designated stroke unit for any part of their index (first) admission. Target is >75%[3]



WOHS-B is not included due to counts being between 1-5

** Hatched bars indicate sites with complementary data suppression (min values plotted)*

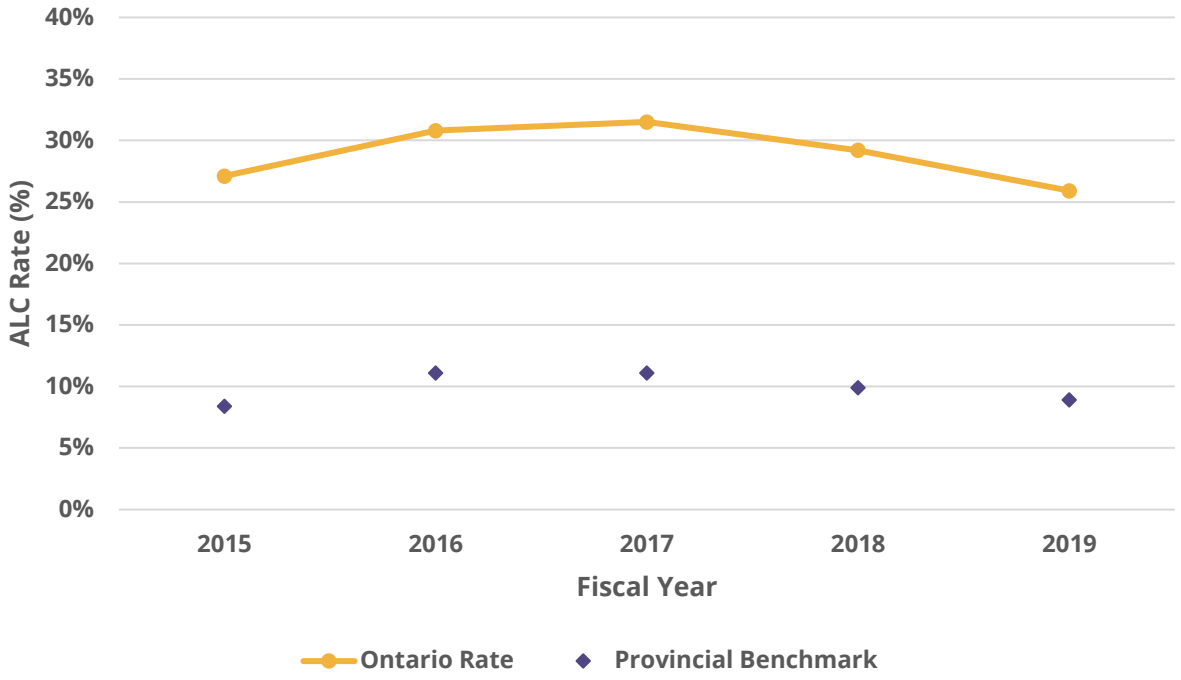
Interpretation Consideration:

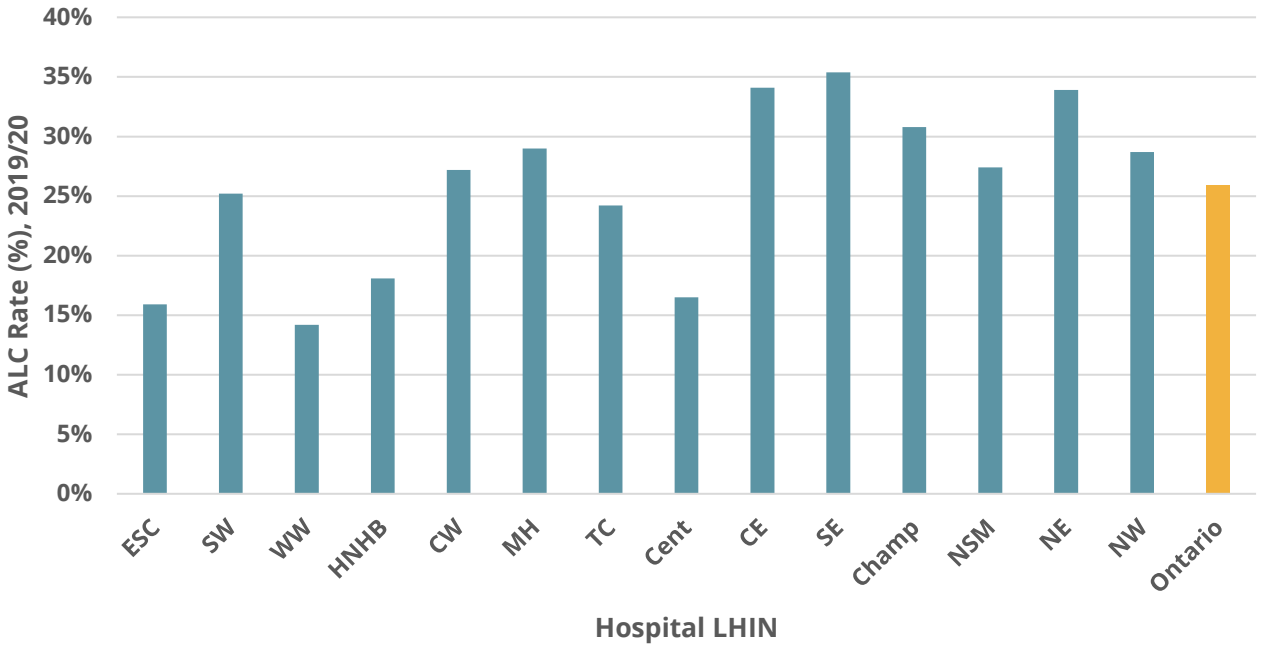
Desired directionality is higher. Patients who receive stroke unit care are more likely to survive, return home and regain independence compared to patients who receive generalized care.[2] To optimize access and improve outcomes to this specialized care, consideration will need to be given to hospital (local) and regional level barriers and enablers. In addition, review and update of the indicator methodology may be helpful to ensure that measurement is reflective of the true performance within the system (e.g., patients not treated in a stroke unit at the index hospital, but are transferred and treated in a stroke unit at the receiving hospital are currently not counted).

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.2: Alternative Level of Care (ALC) Proportion of Total Days for Stroke and TIA Inpatients, FY 2019/20

Indicator Description:

This indicator measures the proportion of total acute hospital days that patients are designated as requiring an alternative level care (ALC).





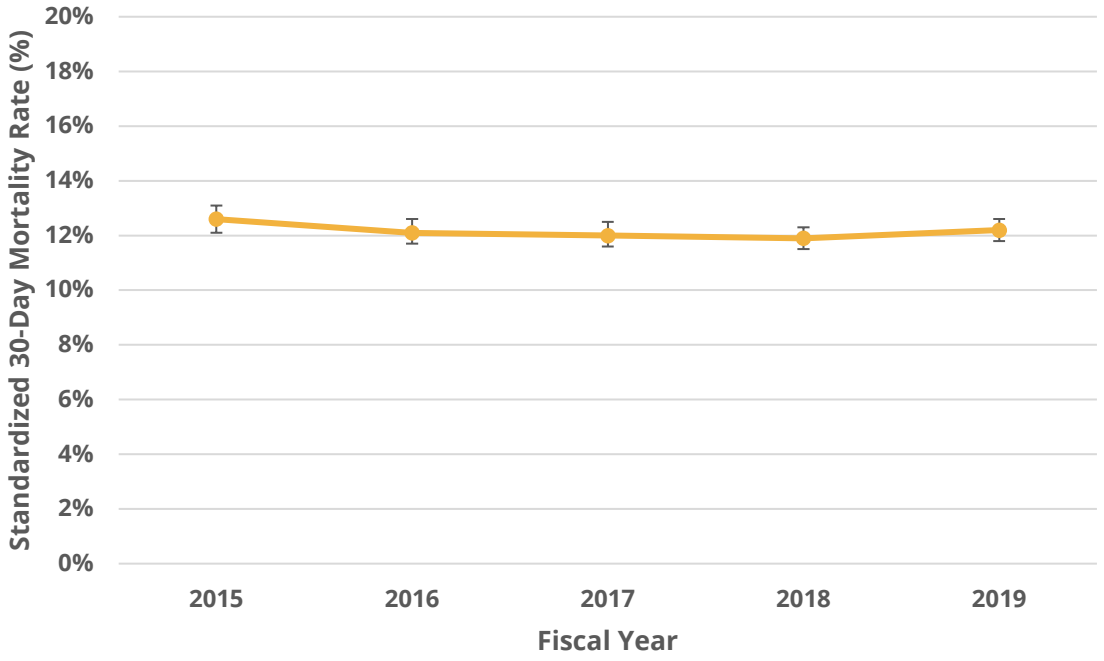
Interpretation Consideration:

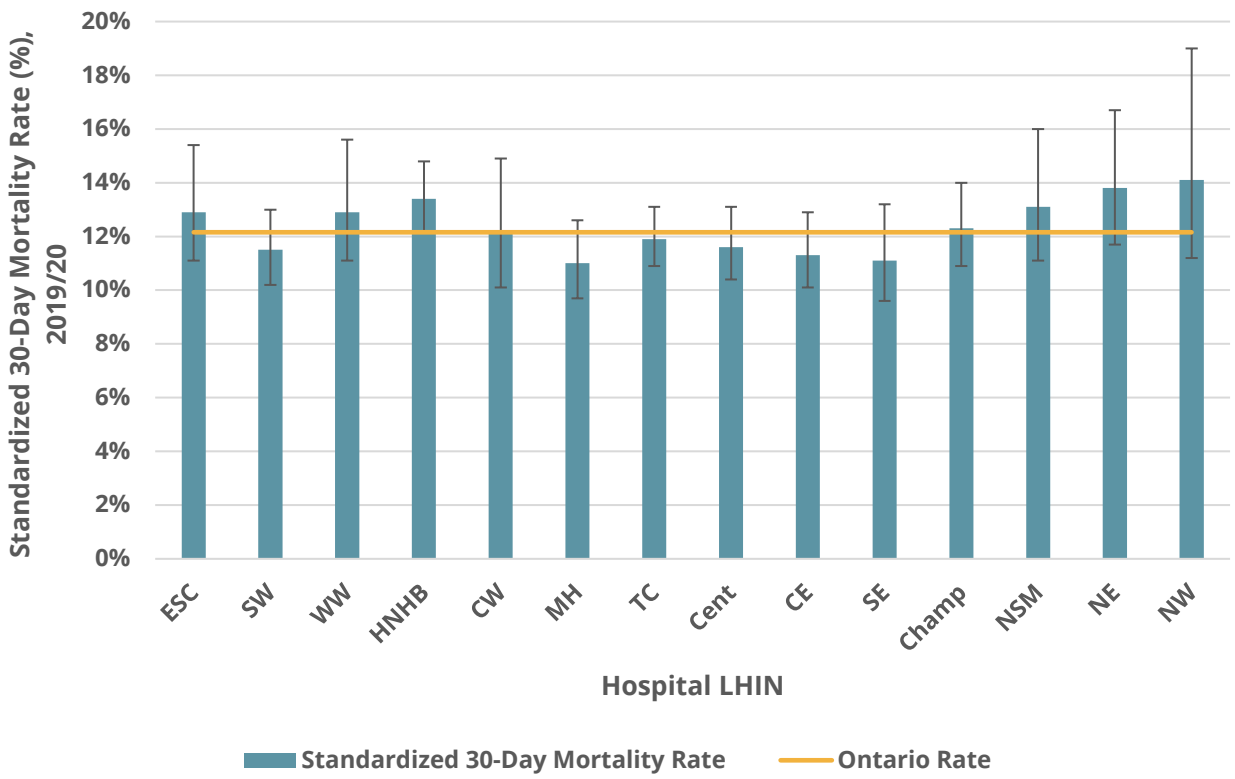
Desired directionality is lower. The provincial ALC rate in the last two fiscal years has decreased. There is wide variation across the LHINs with the ALC rate range of 14% (WW LHIN) to 35% (SE LHIN). A higher proportion of ALC days relative to total length of stay can be interpreted as lack of access to long-term care beds, and post-stroke care including rehabilitation and homecare services.

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.3: Standardized 30-Day All-Cause Mortality Rate of Stroke and TIA Admissions to Acute Care, FY 2019/20

Indicator Description:

This indicator measures the all-cause mortality rate in the 30-days following admission for stroke or TIA. This indicator is adjusted for patient age, stroke type, ambulance arrival and medical history factors including hypertension, atrial fibrillation, and a Charlson Comorbidity Index Score of 7+.





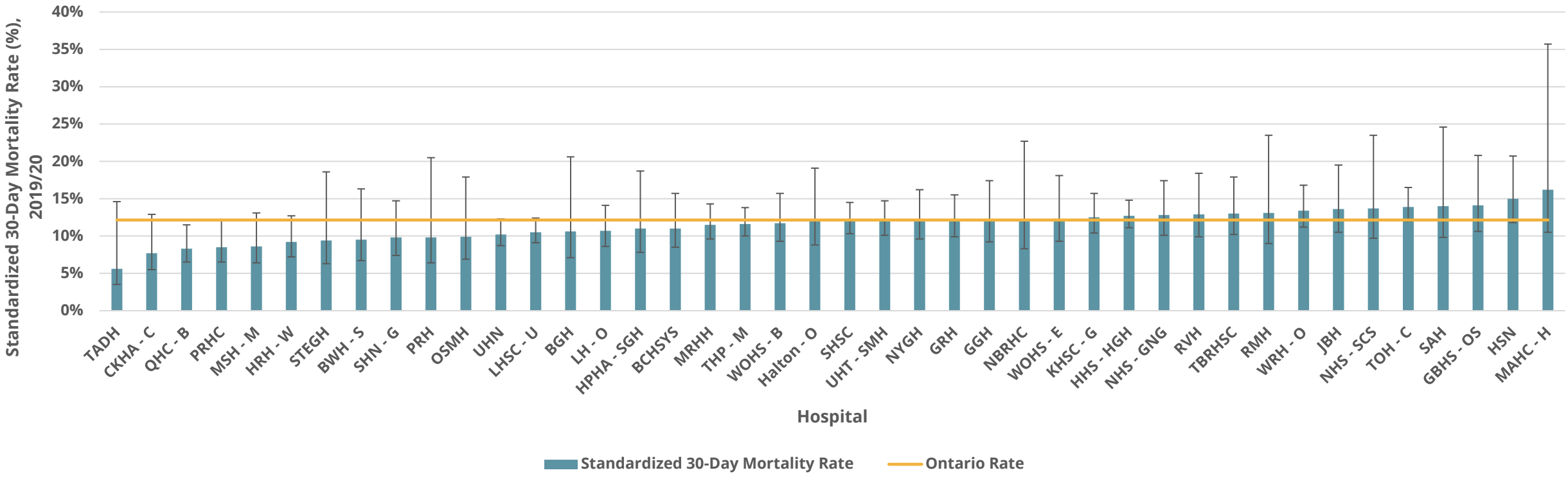
Interpretation Consideration:

Desired directionality is lower. The standardized mortality rate for Ontario has remained relatively flat for the past five years around 12% and there is variation amongst LHINs. This indicator measures all-cause mortality; therefore, death may not be related to the stroke event.

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.3: Standardized 30-Day All-Cause Mortality Rate of Stroke and TIA Admissions to Acute Care, FY 2019/20

Indicator Description:

Hospital Level Results. This indicator measures the all-cause mortality rate in the 30-days following admission for stroke or TIA. This indicator is adjusted for patient age, stroke type, ambulance arrival and medical history factors including hypertension, atrial fibrillation, and a Charlson Comorbidity Index Score of 7+.



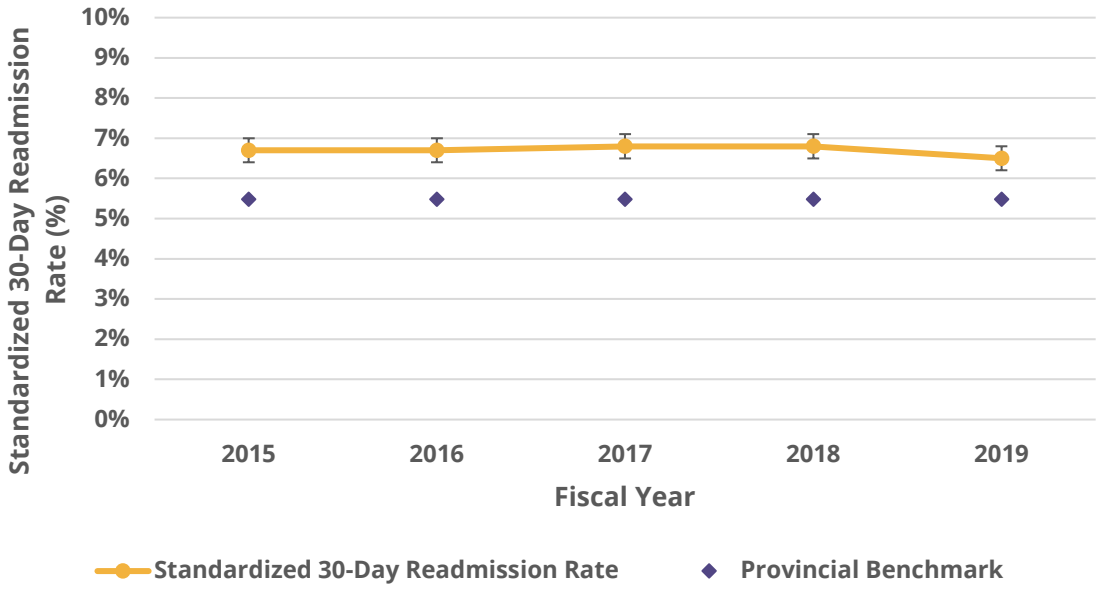
Interpretation Consideration:

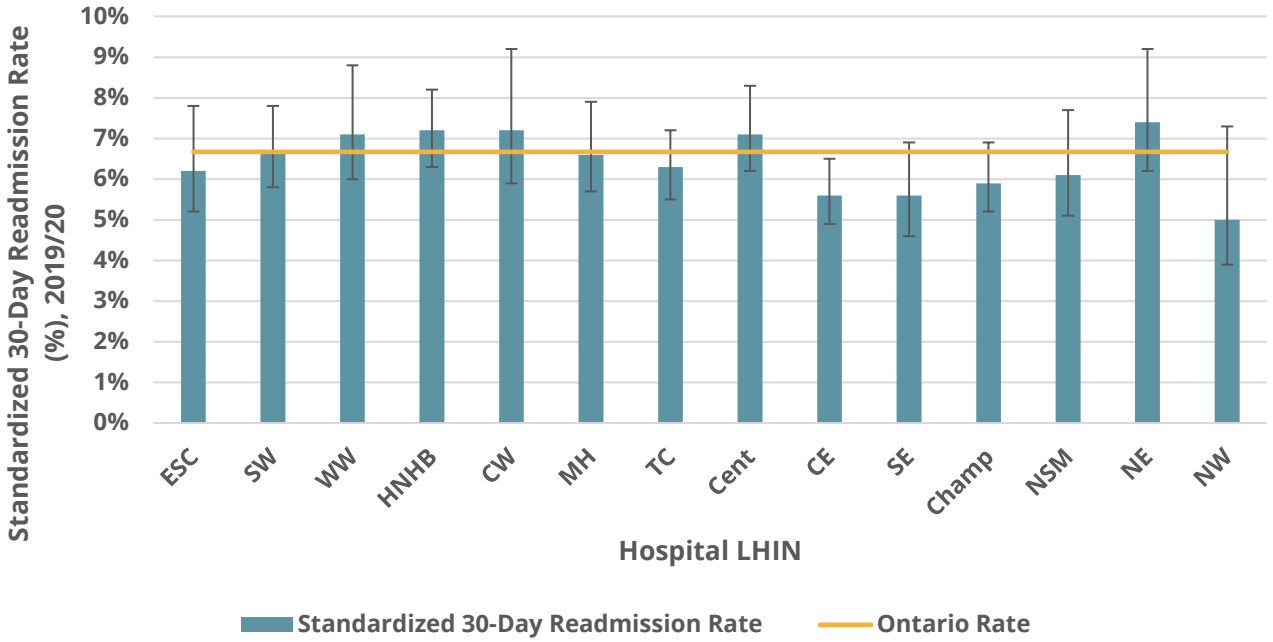
Desired directionality is lower. In 2019/20, QHC-B was the only hospital that was statistically lower than the Ontario rate, while all the other hospitals were not statistically different than the Ontario rate, though some show more variance than others. There may be opportunity to improve consistency of outcomes within or across centres. This indicator measures all-cause mortality; therefore, death may not be related to the stroke event.

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.4: Standardized 30-Day All-Cause Readmission Rate, FY 2019/20

Indicator Description:

This indicator measures the rate at which TIA and stroke patients are readmitted for any cause in the 30-days following discharge from acute care or the emergency department. This indicator is adjusted for patient age and stroke type.





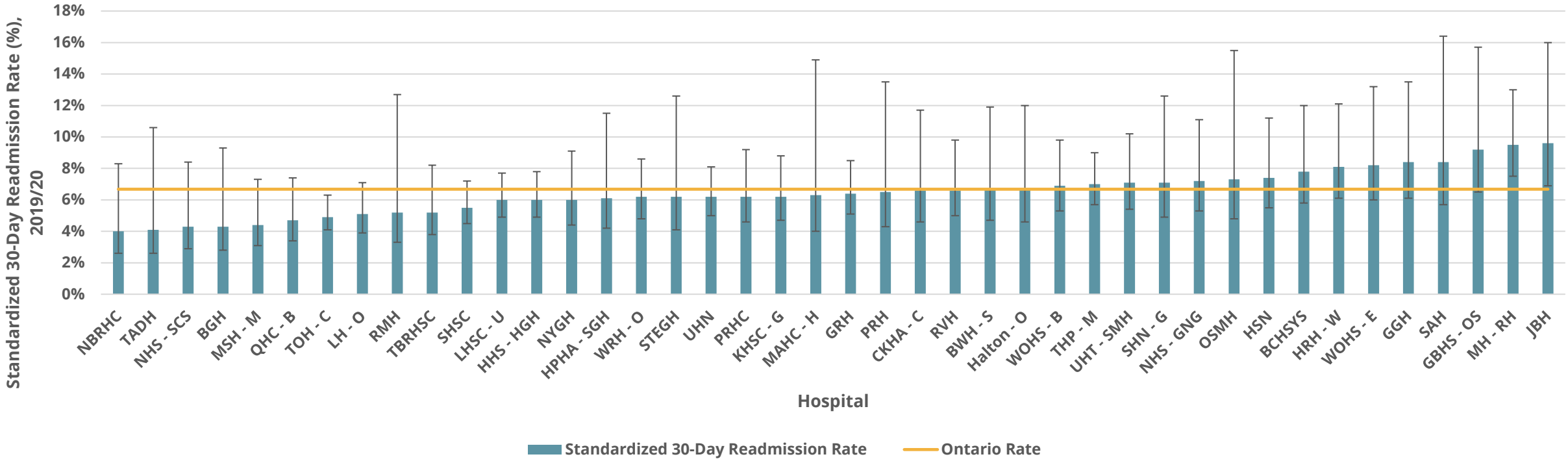
Interpretation Consideration:

Desired directionality is lower. This indicator is for all-cause readmission; therefore, a patient can be readmitted due to non-stroke related causes. In 2019/20, CE LHIN was the only LHIN that was statistically lower than the Ontario rate. For the past five fiscal years, readmission rate has remained relatively flat at under 7%.

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.4: Standardized 30-Day All-Cause Readmission Rate, FY 2019/20

Indicator Description:

This indicator measures the rate at which TIA and stroke patients are readmitted for any cause in the 30-days following discharge from acute care or the emergency department. This indicator is adjusted for patient age and stroke type.



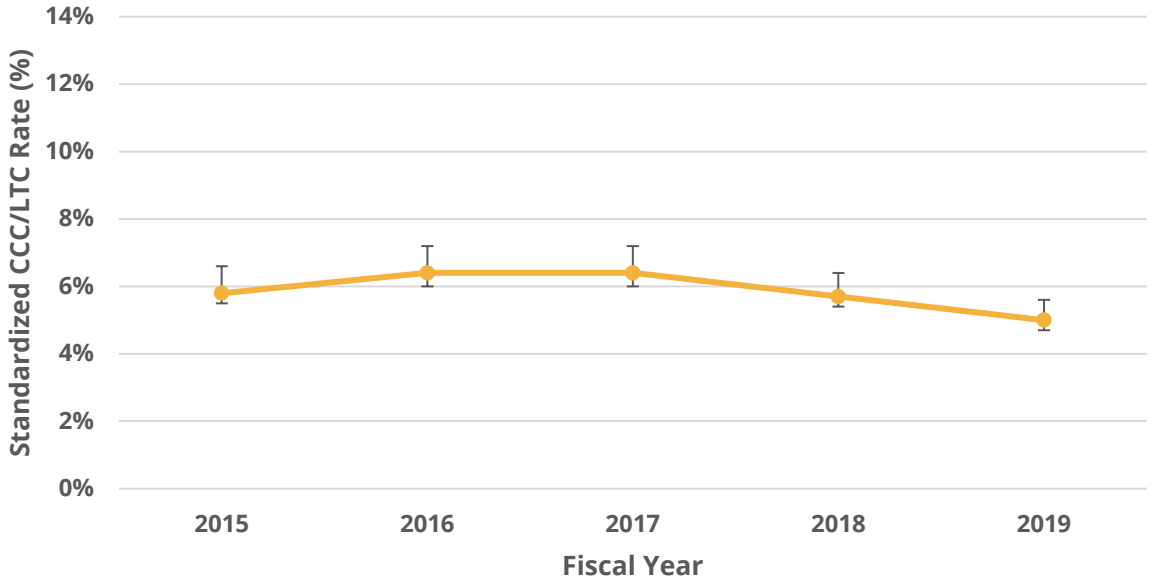
Interpretation Consideration:

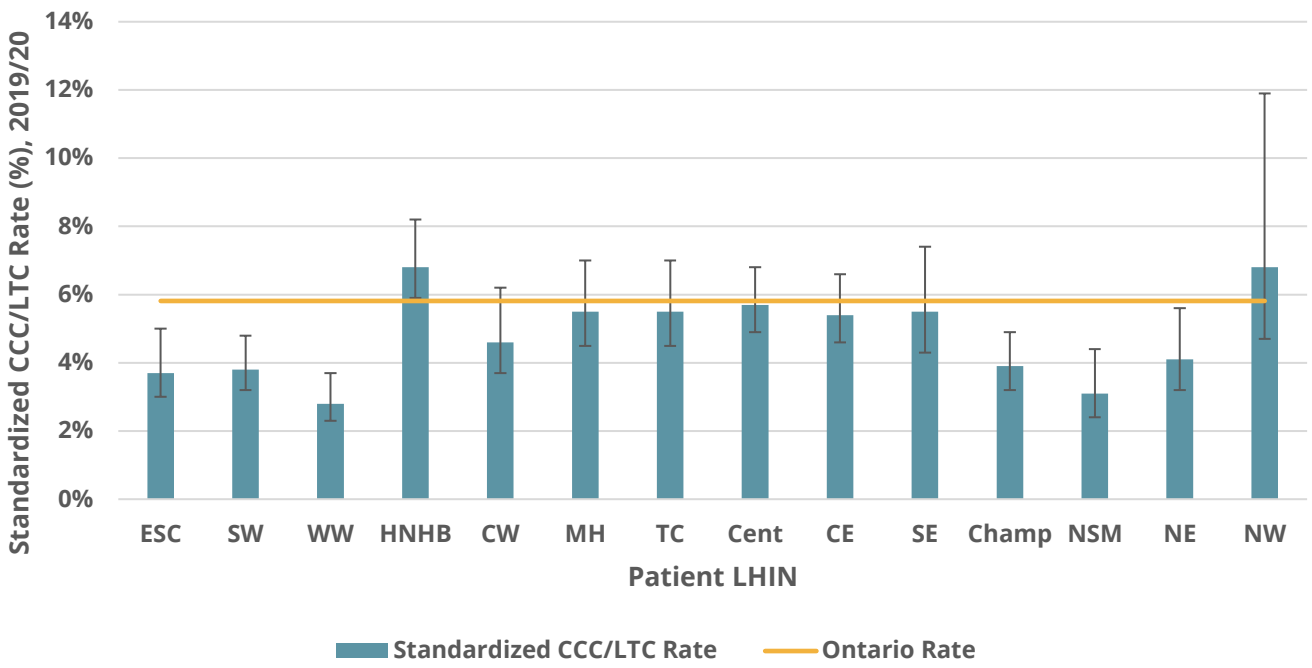
Desired directionality is lower. This indicator is for all-cause readmission; therefore, a patient can be readmitted due to non-stroke related causes. In 2019/20, TOH-C was the only hospital that was statistically lower than the Ontario rate. Some show more variance than others. There may be opportunity to improve consistency of outcomes within or across centres.

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.5: Standardized Rate of Discharge to Complex Continuing Care (CCC) or Long-Term Care (LTC), FY 2019/20

Indicator Description:

This indicator measures the proportion of acute stroke/TIA patients discharged from the index (first) acute care hospital to long-term care (LTC) or complex continuing care (CCC), excluding patients admitted to acute care from chronic hospitals, nursing homes, and homes for the aged. The indicator is adjusted for patient age and stroke type.





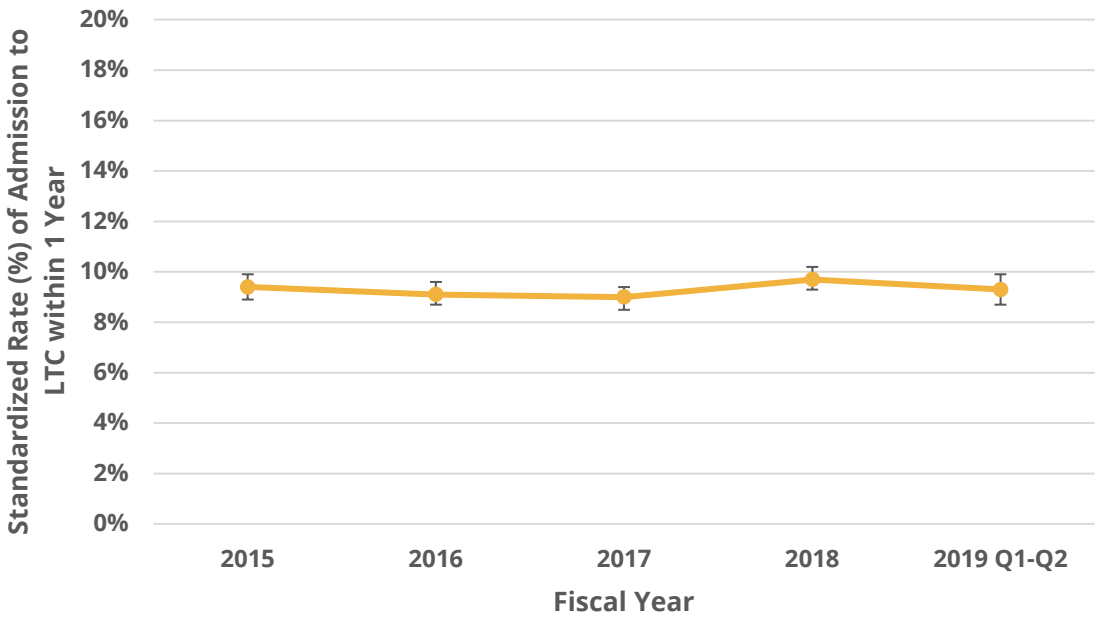
Interpretation Consideration:

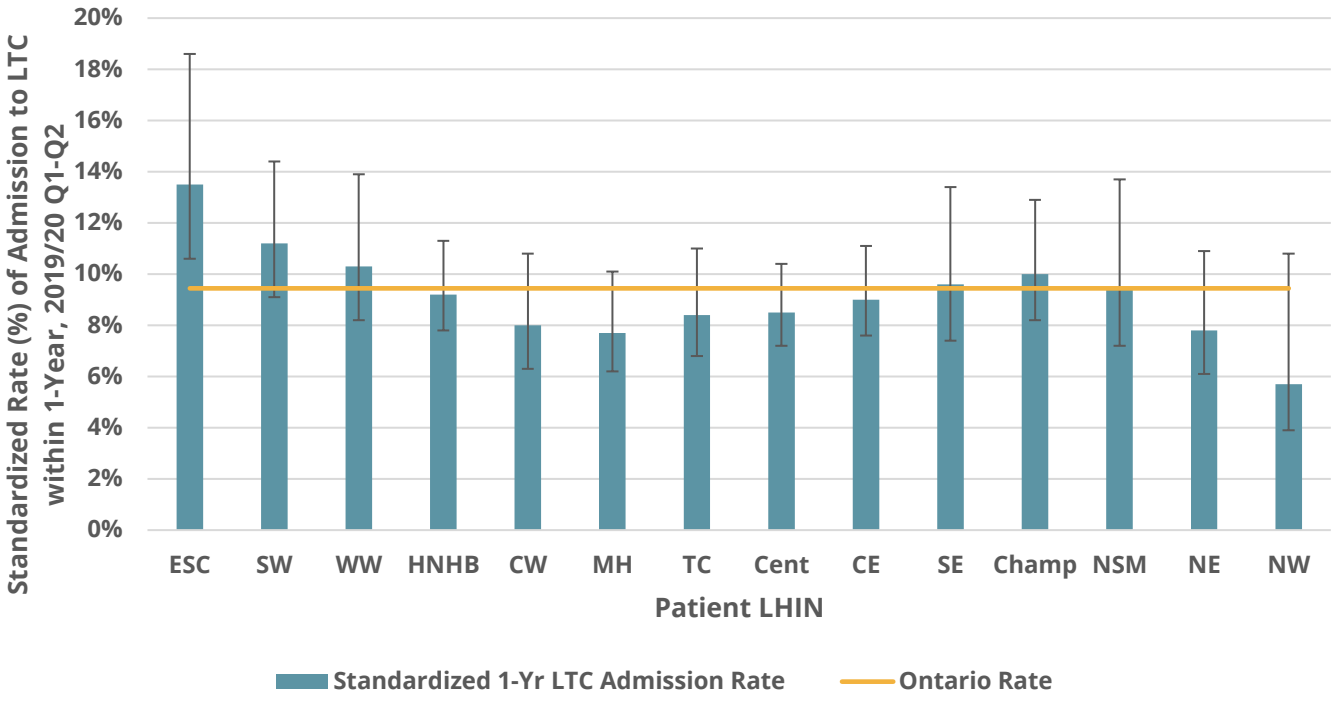
Desired directionality is lower. Patients discharged home and waiting for admission to LTC are not included in the results. There is variability across the province of stroke patients who are discharged to CCC/LTC. This could be related to many factors including variable access to LTC beds, inpatient rehabilitation and/or to home and community care support. CCC beds may be utilized in different ways across the province; this would require further investigation.

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.6: Standardized Rate of Admission to Long-Term Care (LTC) within 1-Year, FY 2019/20 Q1-Q2

Indicator Description:

This indicator measures the proportion of stroke/TIA patients admitted into a long-term care facility within one year (365 days) following discharge from acute care. This indicator excludes patients admitted to acute care from chronic hospitals, nursing homes, and homes for the aged. The indicator is adjusted for patient age and stroke type.





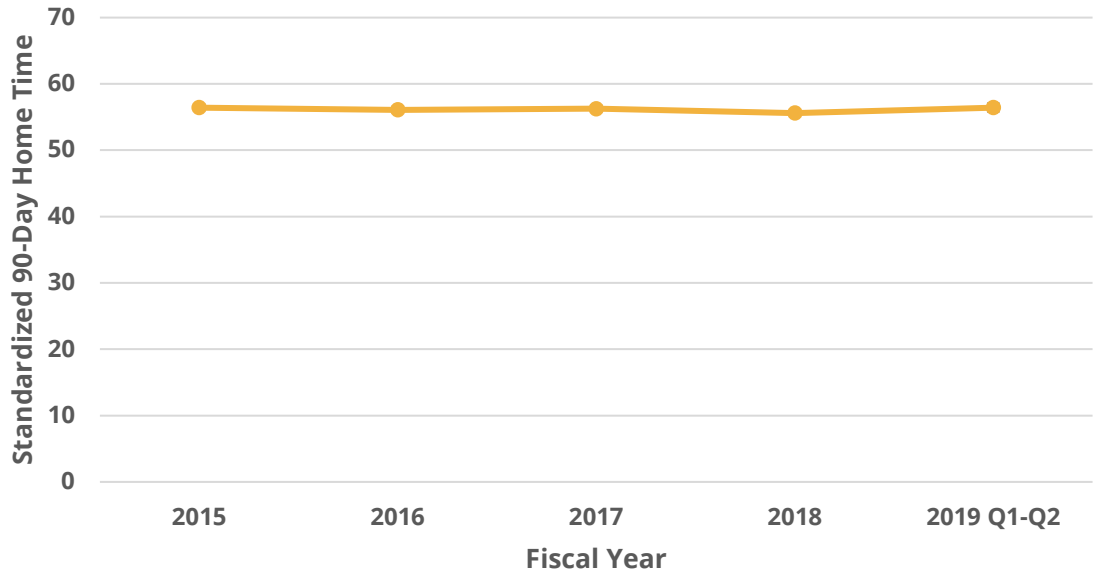
Interpretation Consideration:

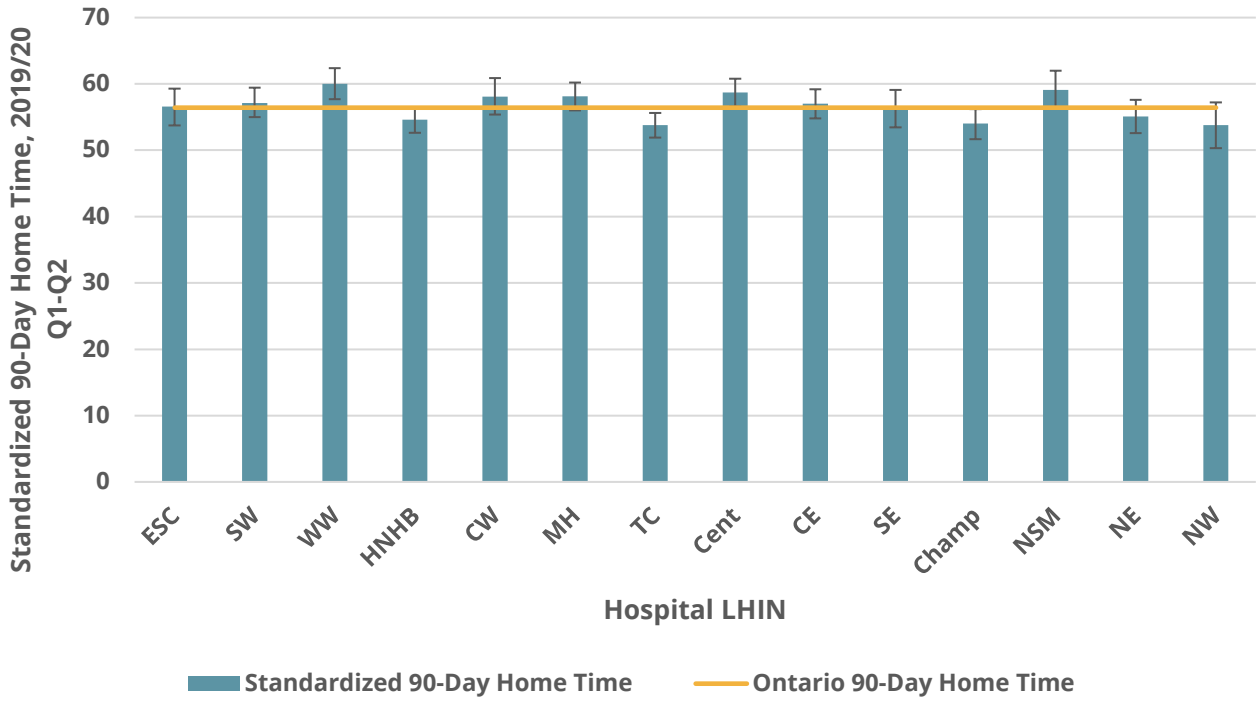
Desired directionality is lower. Patients discharged home and waiting for admission to LTC are not included in the results. For the past five fiscal years, the provincial rate has remained relatively flat at under 10%. ESC LHIN is statistically above the provincial rate, while all the other LHNs are not significantly different than the provincial rate.

Chapter 3: Acute Care Access and Outcomes for Stroke and TIA
Indicator 3.7: Standardized Days at Home in the First 90-Days After Stroke/TIA Admission, FY 2019/20 Q1-Q2

Indicator Description:

This indicator measures the number of days spent at home in the 90-Days following index Stroke/TIA admission. The days at home indicator is standardized for patient age and stroke type.





Interpretation Consideration:

Desired directionality is high. Factors that contribute to lower days at home include: zero home time; in-hospital mortality; admission to CCC , to LTC, or to inpatient rehabilitation versus home rehabilitation; ALC LOS; readmission; and post discharge mortality. This creates a composite indicator of performance. When standardized for patient age and stroke type, patients spent approximately 56 days at home in the first 90 days following a stroke. Further analysis would be needed to understand why there appears to be less variation in this outcome indicator over other outcome indicators. A limitation to this indicator is the inability to determine the level of assistance a patient requires, and the access/availability of social/community supports in order to keep the patient home.

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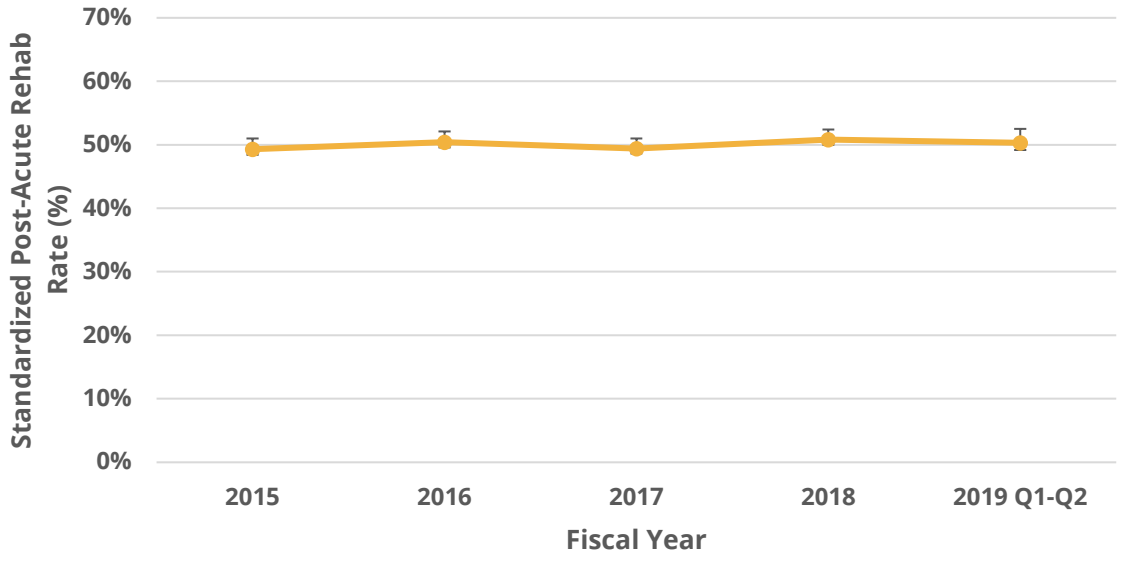
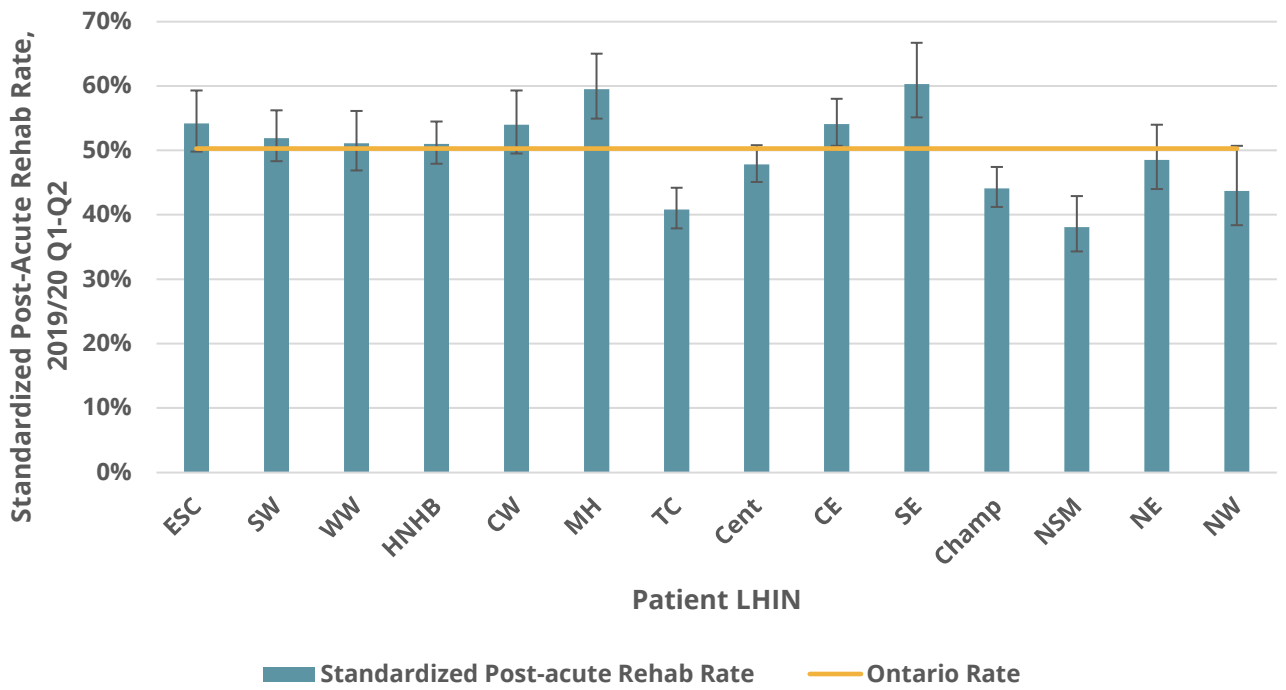
Chapter 4: Post-acute Stroke Rehabilitation Access and Timeliness

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.1.1: Standardized Rate of Access to Post-Acute Inpatient and Home-Based Rehabilitation, FY 2019/20 Q1-Q2

Indicator Description:

Proportion of stroke patients discharged alive from acute care who were either admitted into inpatient rehabilitation or received at least 3 home-based rehabilitation visits. Outpatient rehabilitation is not captured in this indicator. The indicator is standardized for stroke type and AlphaFIM® instrument (AlphaFIM®) score which provides insight into the stroke severity (level of disability function).





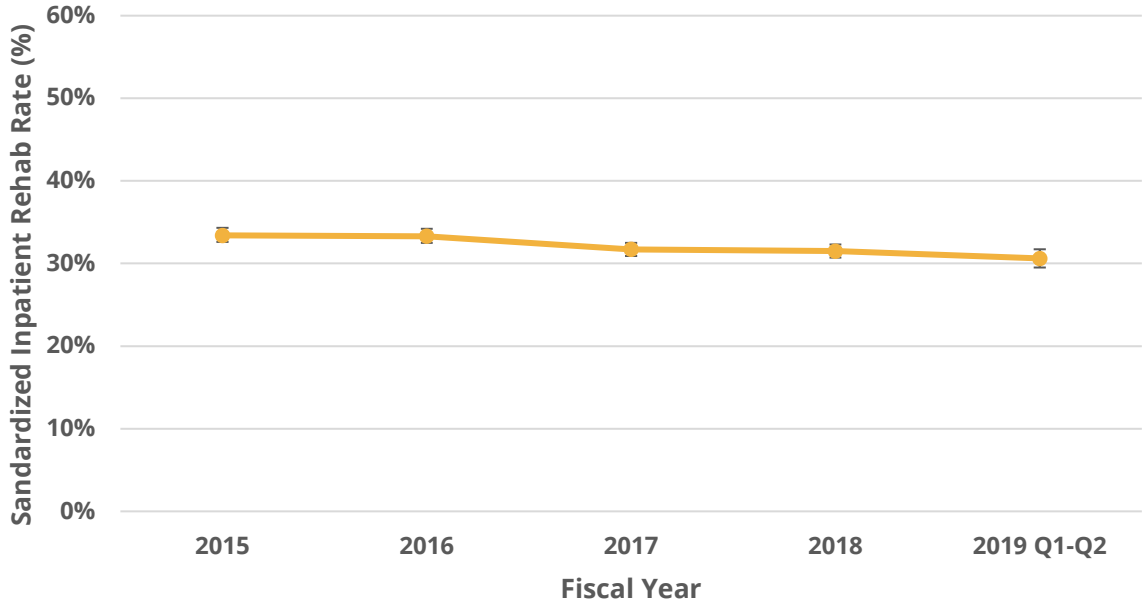
Interpretation Consideration:

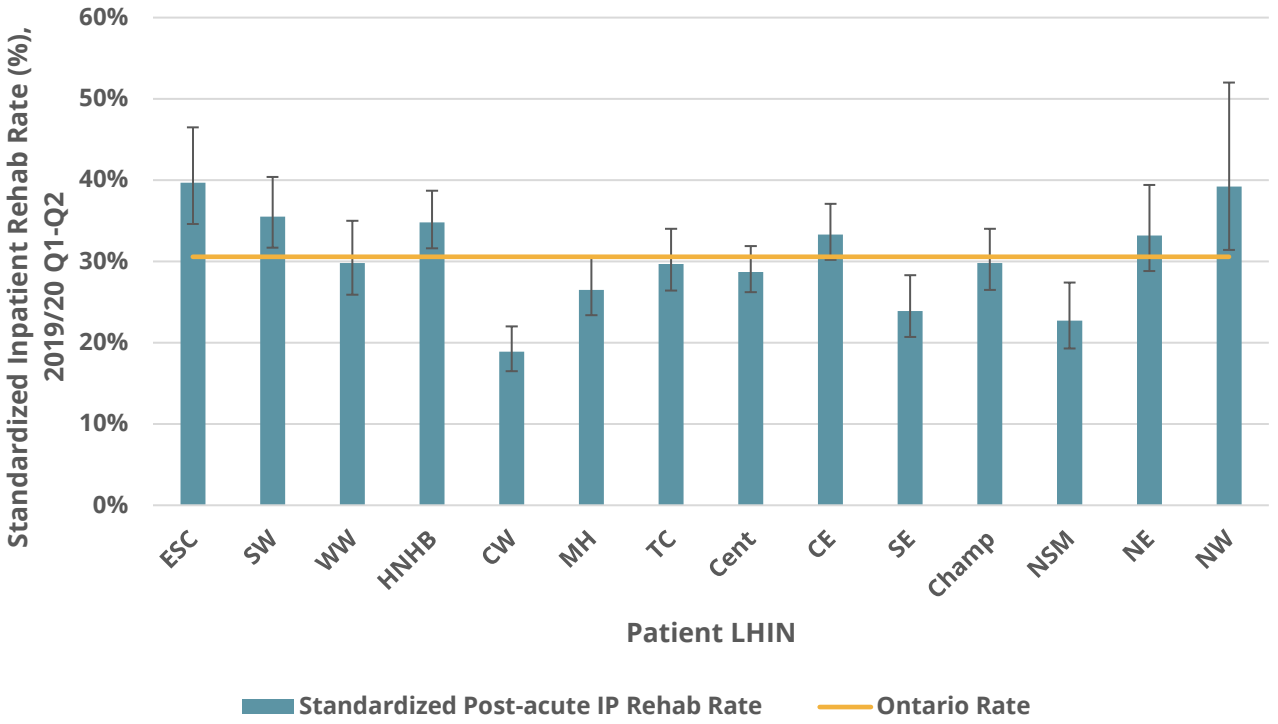
Desired directionality is higher. Provincial access to post-acute rehabilitation (inpatient or home-based) remains relatively flat at 50% from 2015/16 – 2019/20 Q1-Q2. Fully interpreting this trend requires understanding of capacity within the system for community-based stroke rehabilitation services. Currently, there is no standardized provincial system to capture outpatient rehabilitation data. Furthermore, home-based rehabilitation provided by hospitals, are not captured in the HCD (homecare database). For a listing of in-home Community Stroke Rehabilitation Programs across Ontario, see Appendix E.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.1.2: Standardized Rate of Access to Post-Acute Inpatient Rehabilitation, FY 2019/20 Q1-Q2

Indicator Description:

Proportion of stroke patients discharged alive from acute care who went into inpatient rehabilitation. The indicator is standardized for stroke type and AlphaFIM® instrument (AlphaFIM®) score which provides insight into the stroke severity (level of disability function).





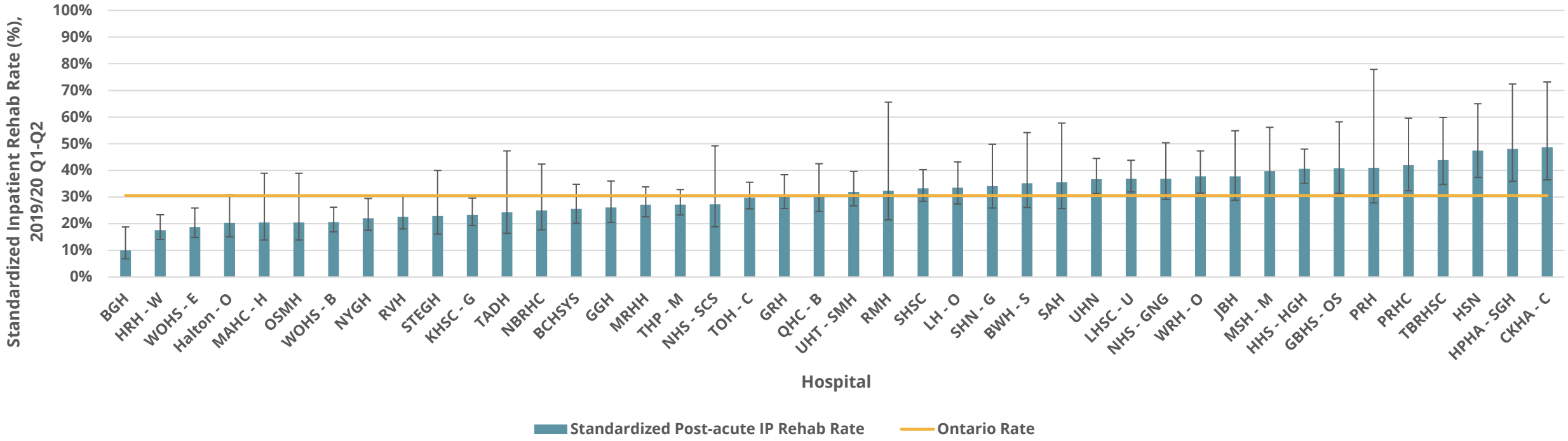
Interpretation Consideration:

Inpatient rehab is most appropriate for stroke patients with moderate to severe disability. There is high variability of access to inpatient stroke rehabilitation across the LHINs. High rates may reflect lack of access to community-based rehabilitation, necessitating admission of stroke patients with milder disability to inpatient rehab programs. Regional context and availability of all rehabilitation services should be considered when interpreting this indicator. Future considerations for this indicator may be to stratify by mild, moderate and severe disability to better understand inpatient rehabilitation utilization.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.1.2: Standardized Rate of Access to Post-Acute Inpatient Rehabilitation, FY 2019/20 Q1-Q2

Indicator Description:

Hospital Level Results. Proportion of stroke patients discharged alive from acute care who went into inpatient rehabilitation. The indicator is standardized for stroke type and AlphaFIM® instrument (AlphaFIM®) score which provides insight into the stroke severity (level of disability function).



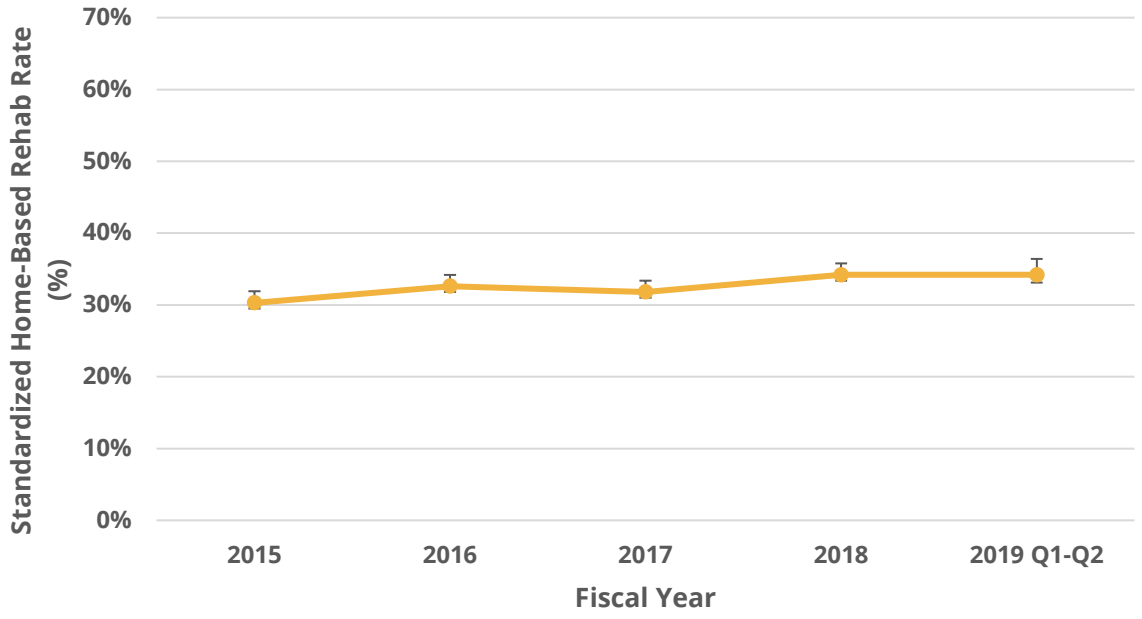
Interpretation Consideration:

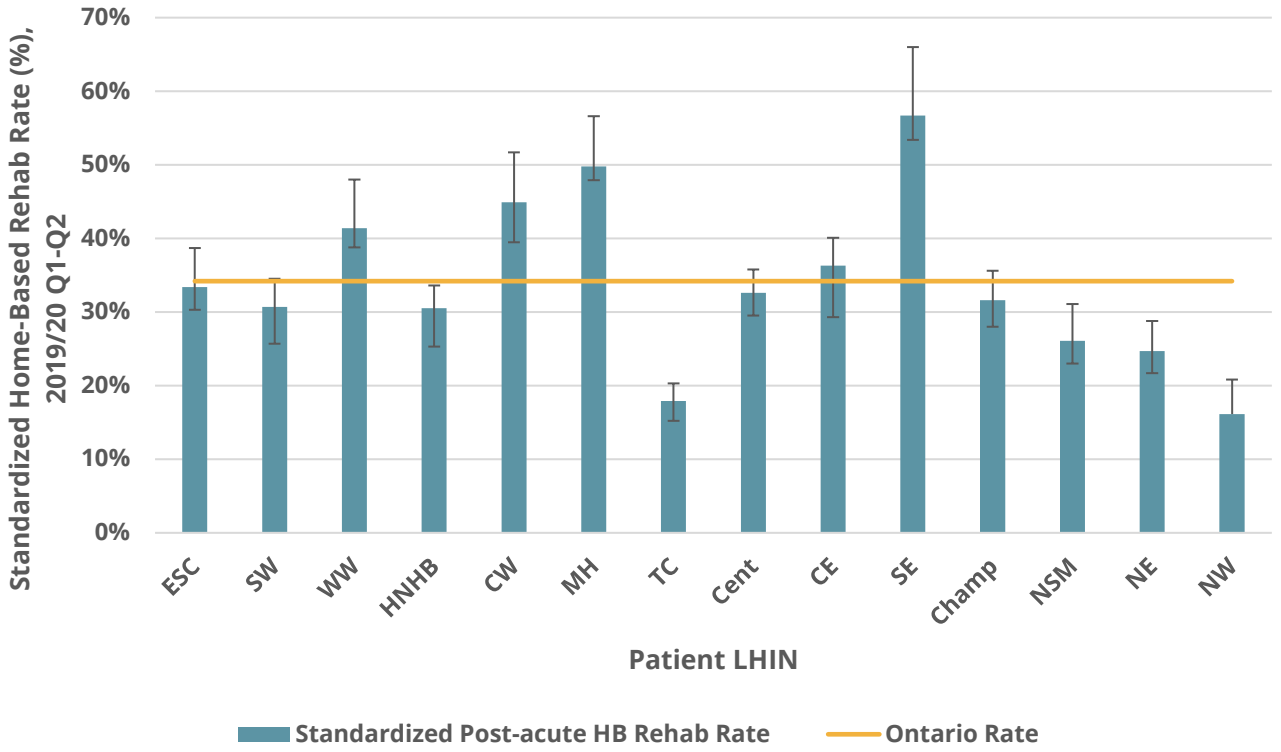
This indicator is reported by the index (first) acute hospital, i.e.., if a patient is transferred to from hospital A to hospital B and is subsequently discharged to IP rehabilitation, that patient is attributed to hospital A. Across these acute hospitals there is high variability of access to inpatient rehabilitation beds for stroke patients. To optimize access to inpatient stroke rehabilitation care, all hospitals should continue to work with their system partners to ensure services, capacity resources and pathways are adequate to meet patients' needs across all rehabilitation settings.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.1.3: Standardized Rate of Access to Post-Acute Home-Based Rehabilitation, FY 2019/20 Q1-Q2

Indicator Description:

Proportion of stroke patients discharged alive from acute care who received at least 3 home-based rehabilitation visits. The indicator is standardized for stroke type and AlphaFIM® instrument (AlphaFIM®) score which provides insight into the stroke severity (level of disability function).





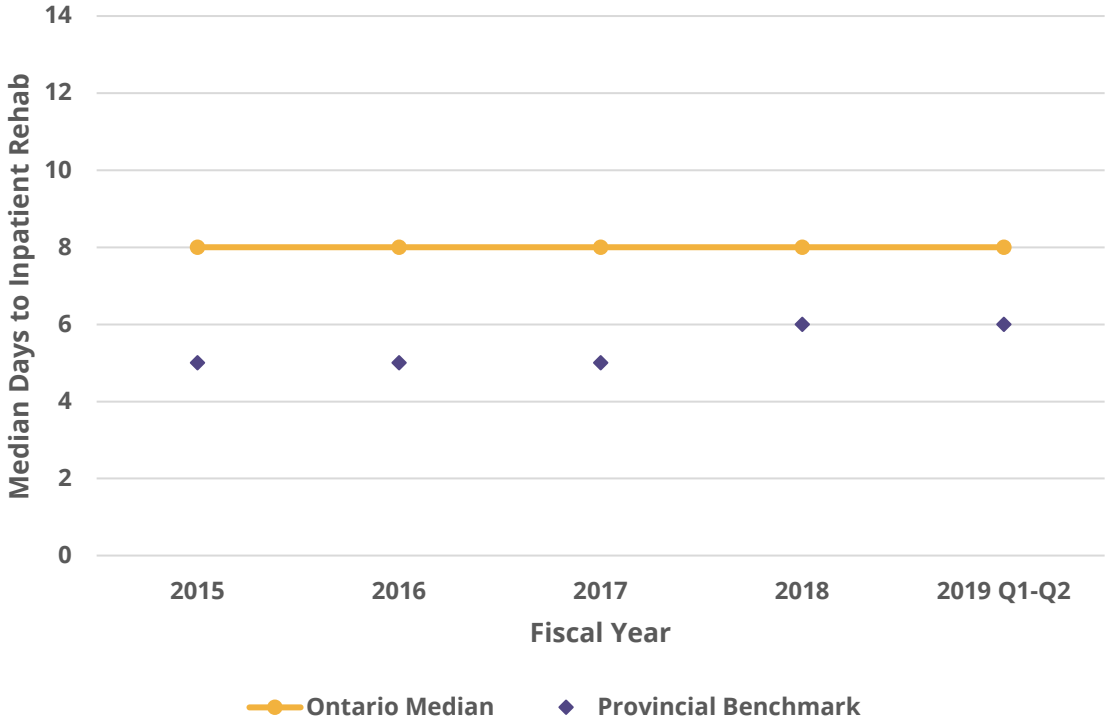
Interpretation Consideration:

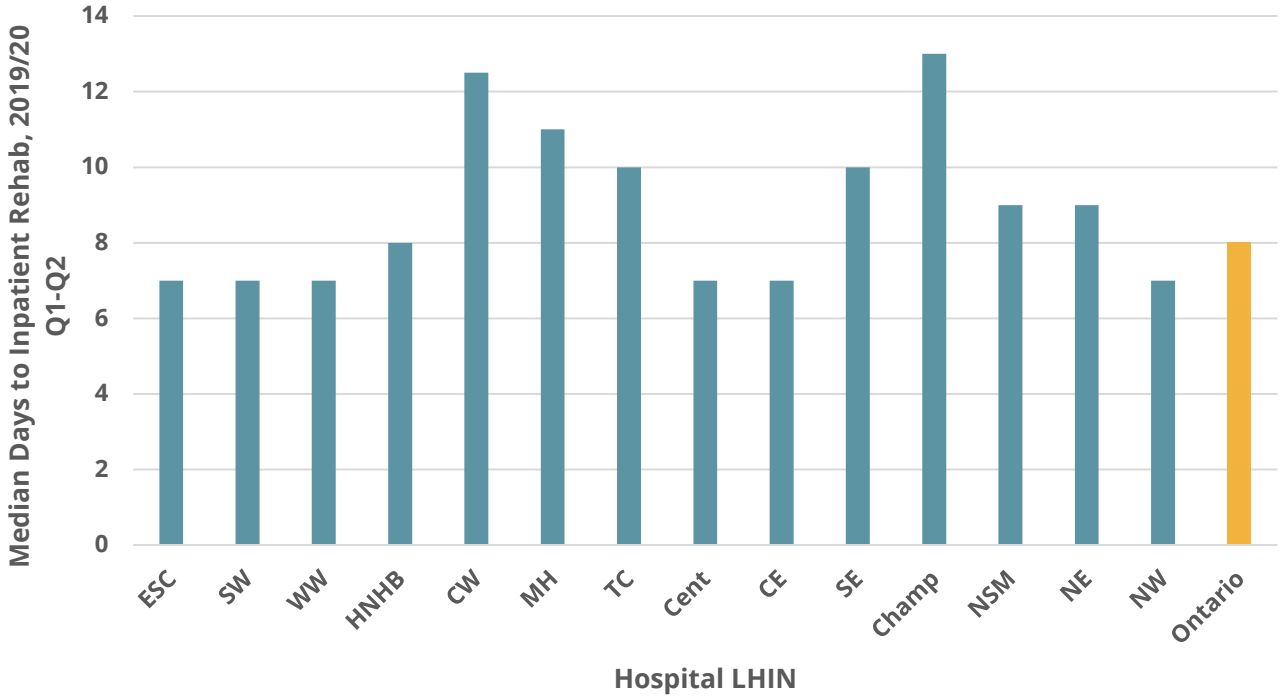
Provincial access to home-based rehabilitation increased from 30% in 2015/16 to 34% in 2019/20 Q1-Q2. Variability within the LHINs may reflect availability of both inpatient and outpatient rehabilitation services; however, there is no standardized provincial system to capture outpatient rehabilitation data. Furthermore, home-based rehabilitation provided by hospitals, are not captured in the HCD (homecare database). For a listing of in-home Community Stroke Rehabilitation Programs across Ontario, see Appendix E.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.2.1: Median Days to First Post-Acute Inpatient Rehabilitation, FY 2019/20 Q1-Q2

Indicator Description:

Median time (days) from acute admission to post-acute inpatient rehabilitation admission. Metric includes stroke patients that were admitted to inpatient rehabilitation within one calendar day following discharge from acute care.





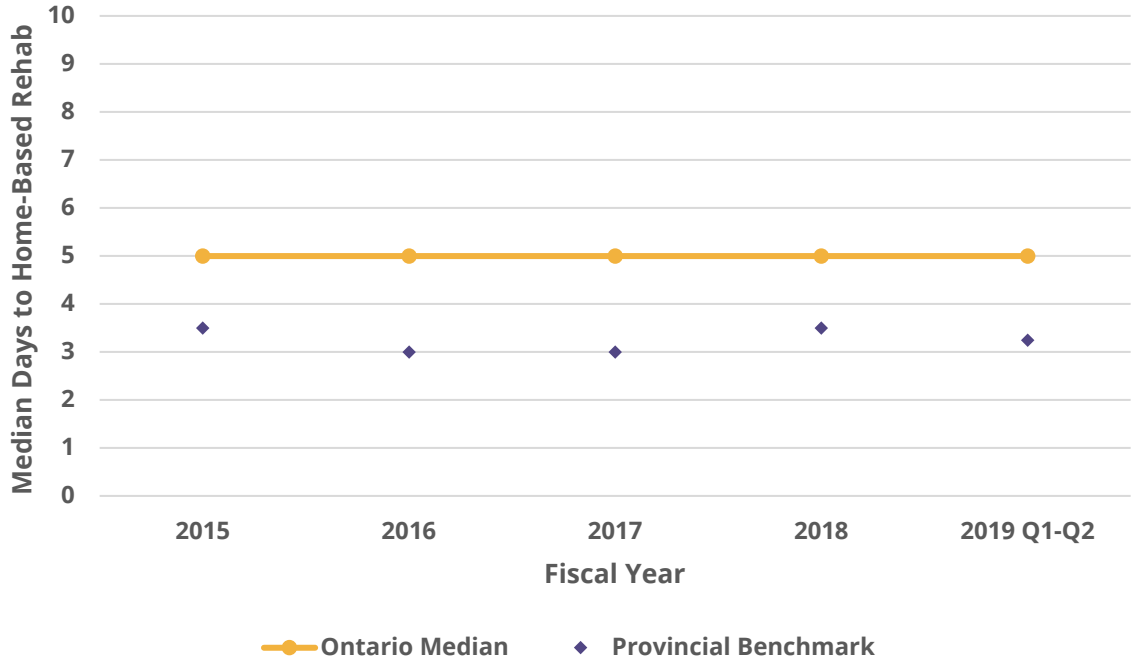
Interpretation Consideration:

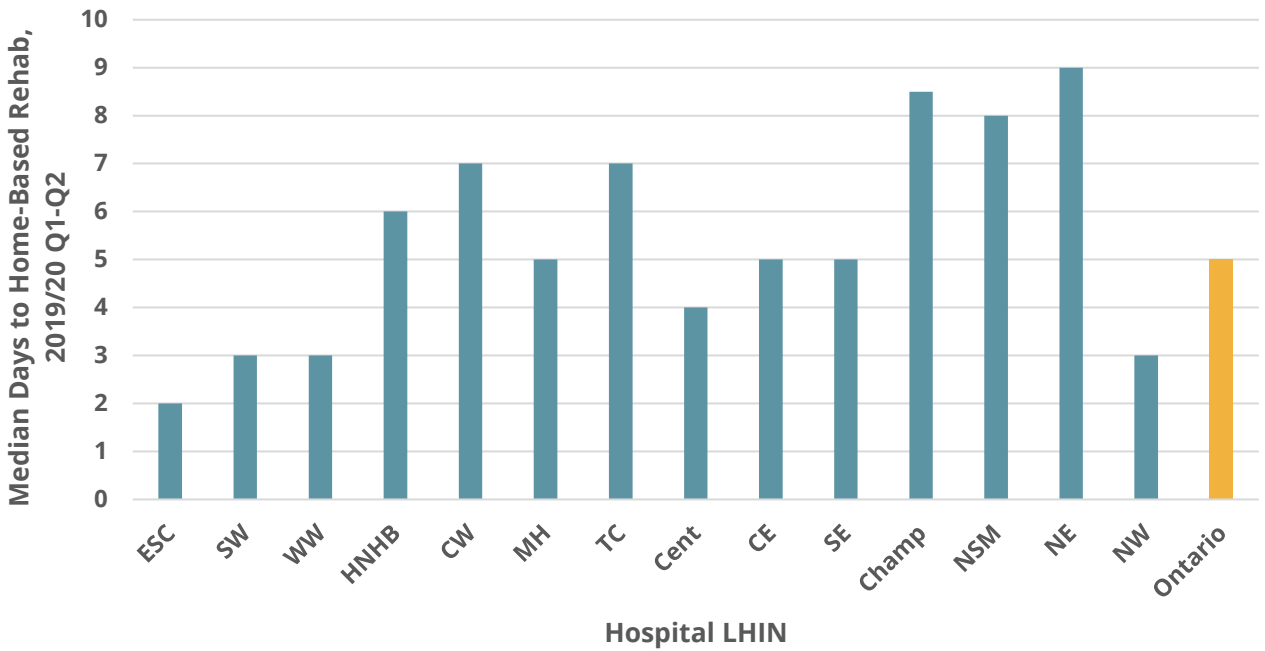
Best practice recommends that ischemic stroke patients should access inpatient rehabilitation by day 6 of acute admission, and hemorrhagic stroke patients should access inpatient rehabilitation by day 8 of their acute admission.[4] Provincially median days to inpatient rehabilitation was 8 days for the entire reporting period; however, there is regional variability which may reflect various factors e.g., inpatient and community-based rehabilitation capacity, referral processes, stroke type and medical complexities.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.2.2: Median Days to First Post-Acute Home-Based Rehabilitation, FY 2019/20 Q1-Q2

Indicator Description:

Median time (days) from acute discharge to post-acute home-based rehabilitation visit (at least 3 home-based visits). Stroke patients admitted to inpatient rehabilitation are not included in this metric.





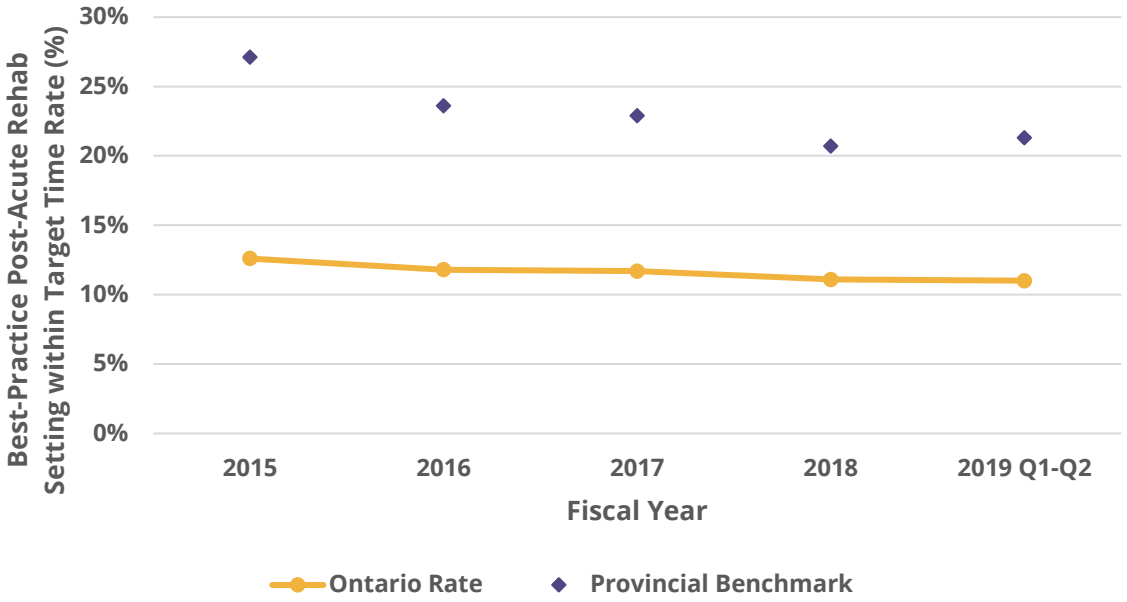
Interpretation Consideration:

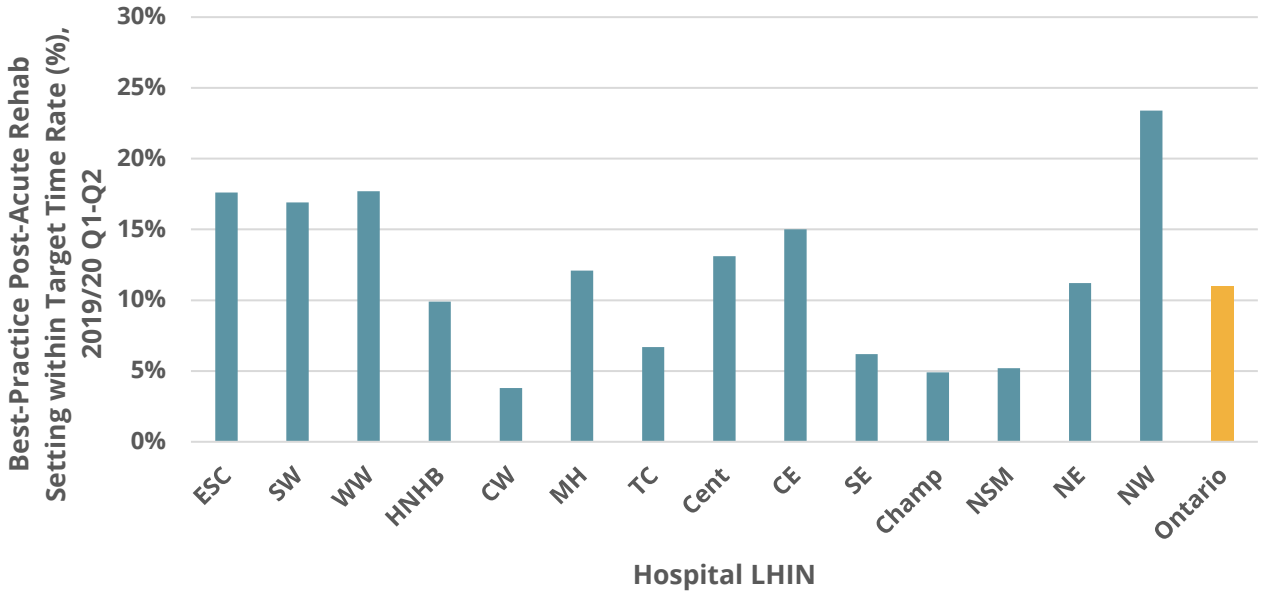
Home-based rehabilitation should be made available within 48 hours after discharge from acute care.[9] This indicator only considers time to first visit and does not reflect timeliness of subsequent visits. Provincially median days to home-based rehabilitation visits was 5 days for the past 5 years; however, there is regional variability which may reflect various factors e.g., existence of stroke specific home-based rehabilitation, capacity to admit, referral processes and first visit protocols. Furthermore, home-based rehabilitation provided by hospitals, are not captured in the HCD (homecare database). For a listing of in-home Community Stroke Rehabilitation Programs across Ontario, see Appendix E.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.3: Best Practice Post-Acute Rehabilitation Setting within Target Time Rate, FY 2019/20 Q1-Q2

Indicator Description:

This indicator is the proportion of stroke patients who received post-acute rehab at the care setting and within recommended times as determined by the AlphaFIM® instrument (AlphaFIM®) score which provides insight into the stroke severity (level of disability function), according to current best practices. Patients without an AlphaFIM® score are not included in the indicator.





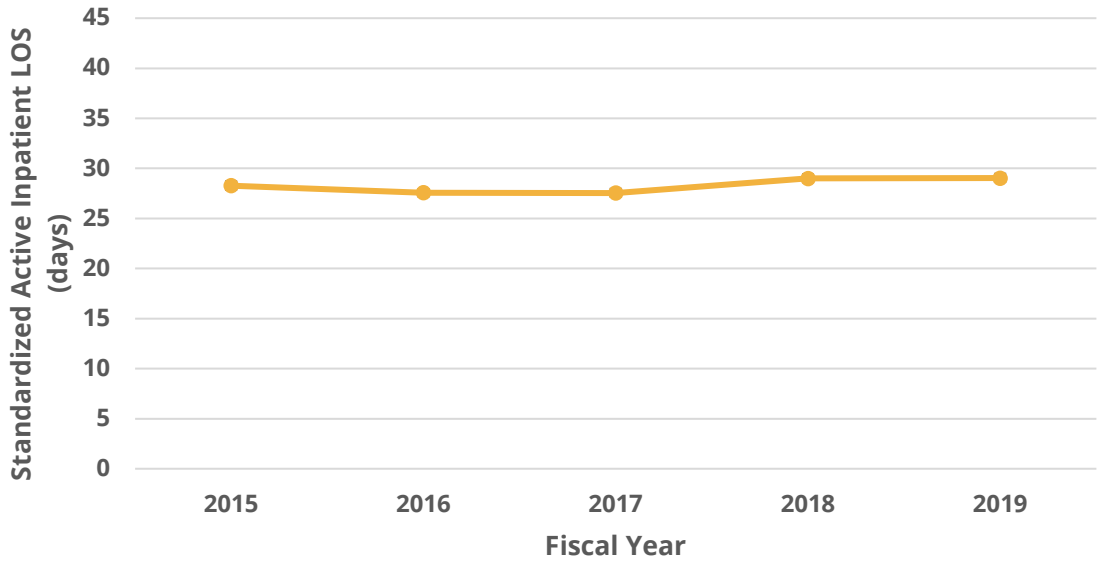
Interpretation Consideration:

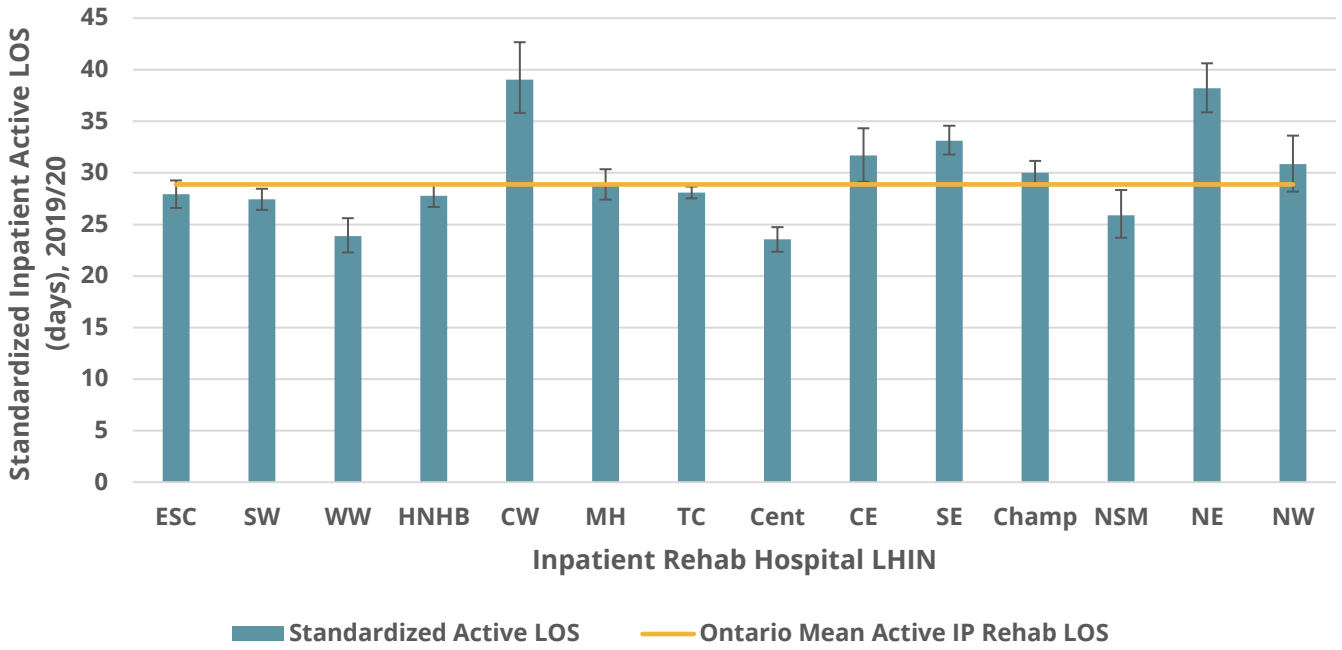
Desired directionality is higher. Fully interpreting this indicator requires understanding of capacity within the system for community-based stroke rehabilitation services. Currently, there is no standardized provincial system to capture outpatient rehabilitation data; hence, patients who are referred to outpatient rehab programs within target times will not be included in this metric. Furthermore, home-based rehabilitation provided by hospitals are not captured in the HCD (homecare database). For a listing of in-home Community Stroke Rehabilitation Programs across Ontario, see Appendix E. Regions will need to take into consideration patients' needs, rehabilitation resources, and a systems approach to addressing gaps in timely access to appropriate rehabilitation settings.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.4: Standardized Active Inpatient Rehabilitation Length of Stay (LOS) (days), FY 2019/20

Indicator Description:

This indicator measures the average active length of stay of stroke patients in inpatient rehabilitation. The indicator is standardized for FIM motor score and FIM cognitive score.





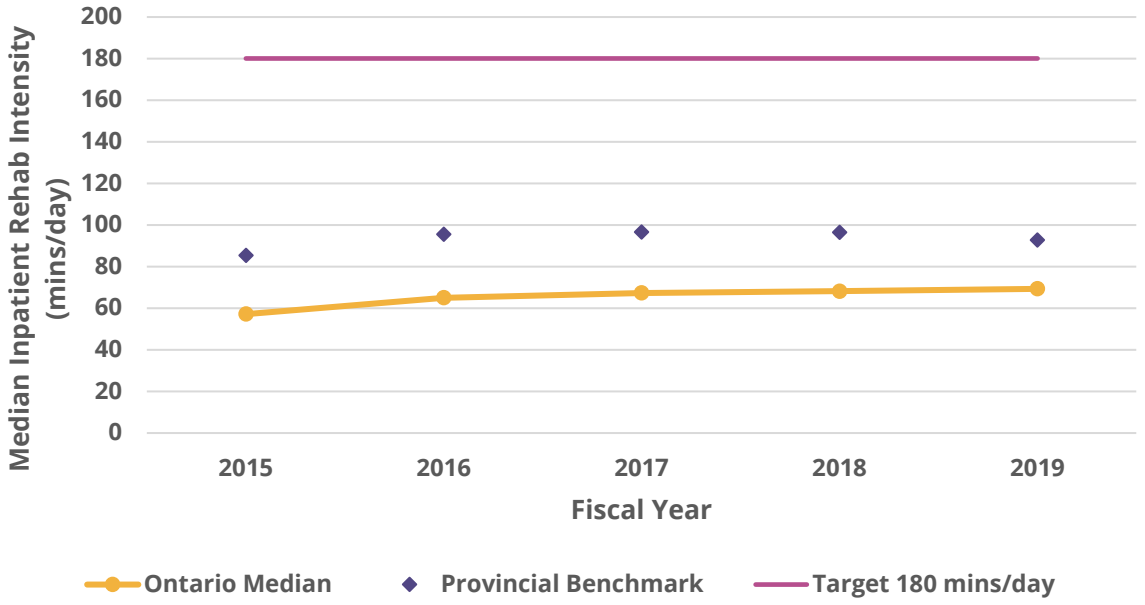
Interpretation Consideration:

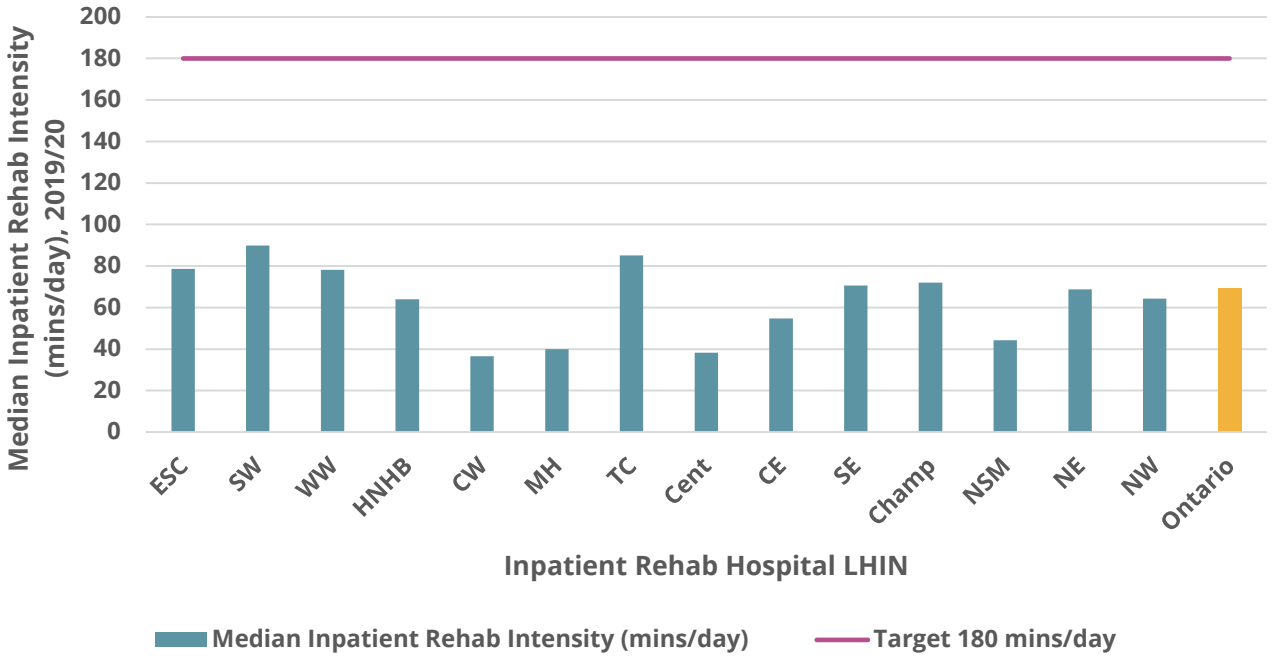
Patient's length of stay in post-acute inpatient rehabilitation is based on the patient's needs. Availability of community support and rehabilitation services may influence flow through the system.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.5: Median Minutes per Day of Direct Inpatient Rehabilitation Therapy, FY 2019/20

Indicator Description:

This indicator measures number of minutes per day of direct therapy received by stroke patients during their active inpatient rehab stay. Target is 180 minutes/day[4]





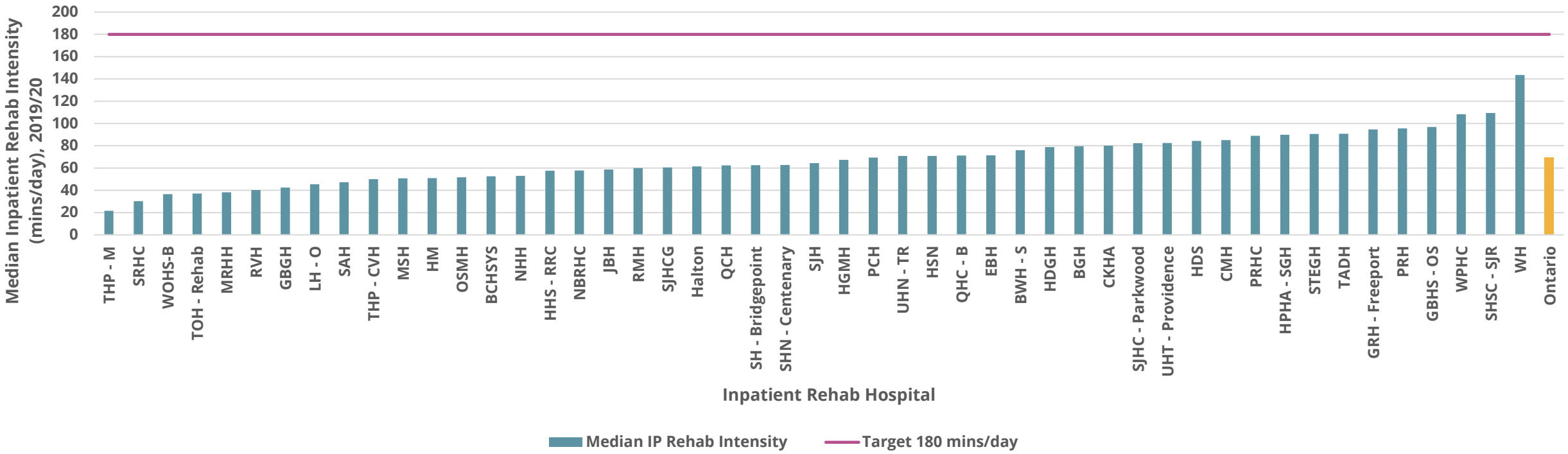
Interpretation Consideration:

Desired directionality is high. Direct inpatient rehabilitation therapy in Ontario has increased from 57.2 minutes per day in 2015, to 69.3 minutes per day in 2019. There is wide variation in LHIN performance in 2019 from 36.5 minutes per day in CW LHIN to 89.9 minutes per day in SW LHIN. All LHINs are well below the target of 180 minutes per day of direct inpatient rehabilitation therapy. This metric excludes group therapy, and any rehabilitation assistant time that accounts for more than 33% of the total rehabilitation time.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.5: Median Minutes per Day of Direct Inpatient Rehabilitation Therapy, FY 2019/20

Indicator Description:

Inpatient Rehabilitation Hospital Level Results. This indicator measures number of minutes per day of direct therapy received by stroke patients during their active inpatient rehab stay. Target is 180 minutes/day[4]



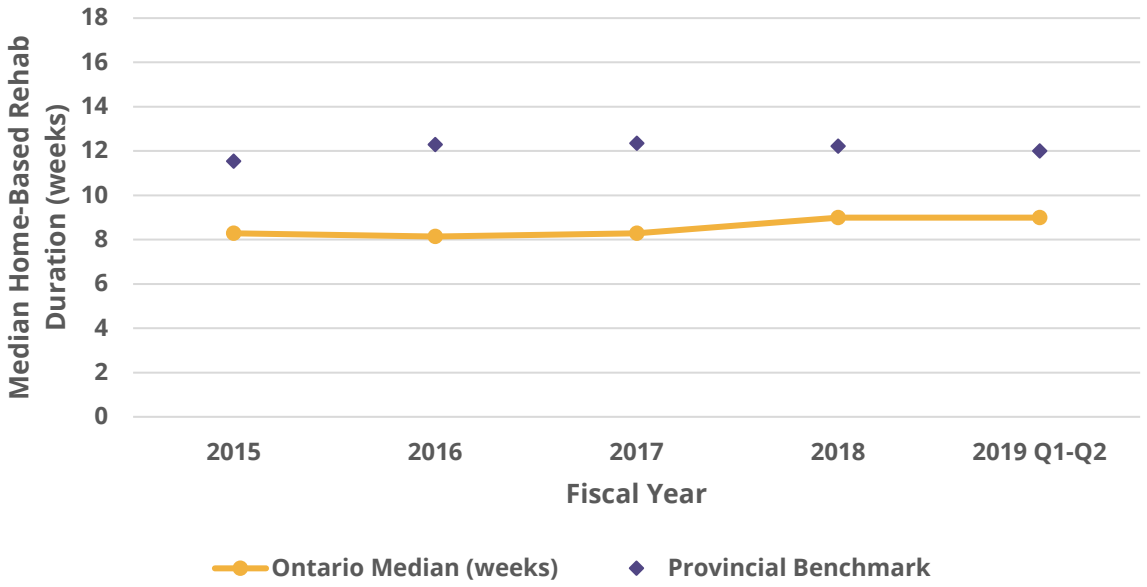
Interpretation Consideration:

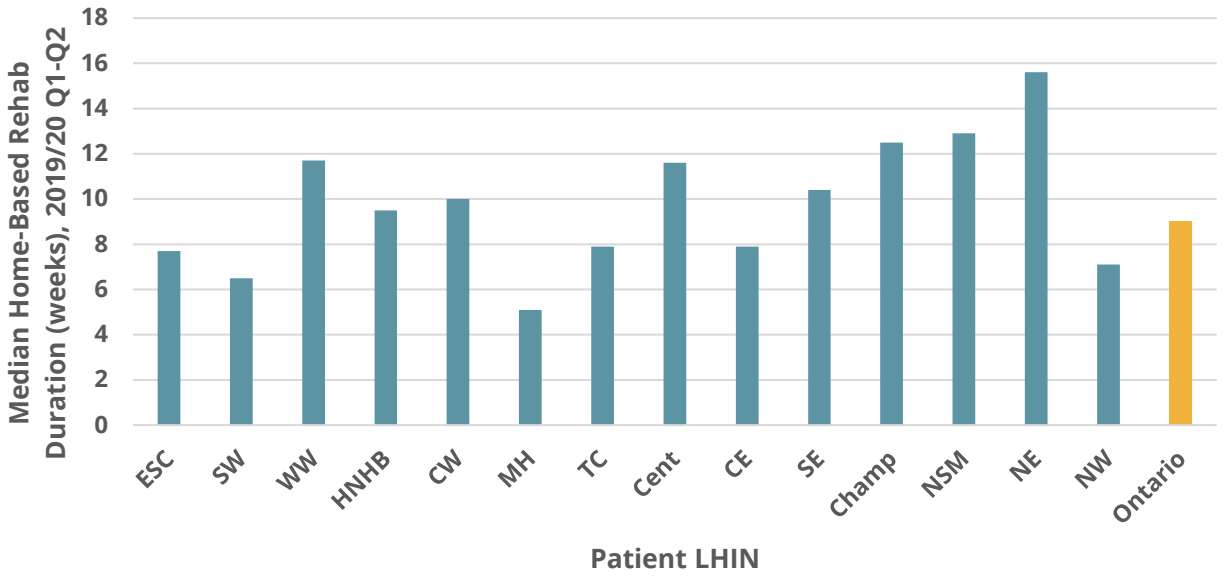
Desired directionality is high. There is wide variation in hospital performance in 2019 from 21.5 minutes per day for THP-M to 143.5 minutes per day for WH. All inpatient rehabilitation hospitals are below the target of 180 minutes per day of direct inpatient rehabilitation therapy.[4] This metric excludes group therapy, and any rehabilitation assistant time that accounts for more than 33% of the total rehabilitation time.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.6: Median Duration of Home-Based Rehabilitation (weeks), FY 2019/20 Q1-Q2

Indicator Description:

The number of weeks of home-based rehabilitation (PT, OT, SLP, and/or social work) following discharge from acute care or inpatient rehabilitation, up to a maximum of 180 days. The first home-based rehab visit must start within 60 days of discharge from acute or inpatient rehabilitation, and the patient must receive at least 3 home-based rehabilitation visits.





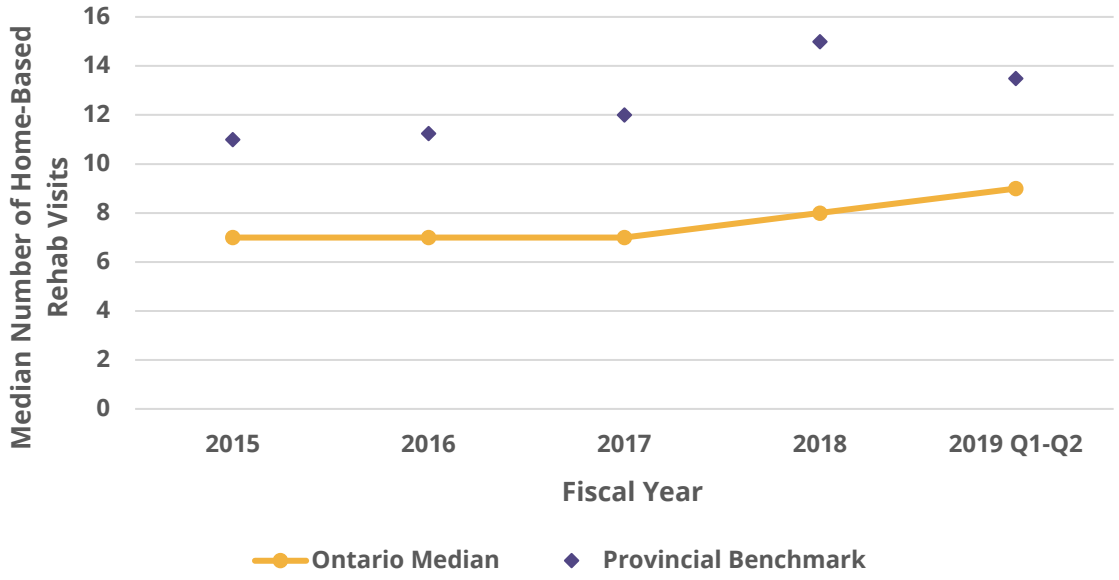
Interpretation Consideration:

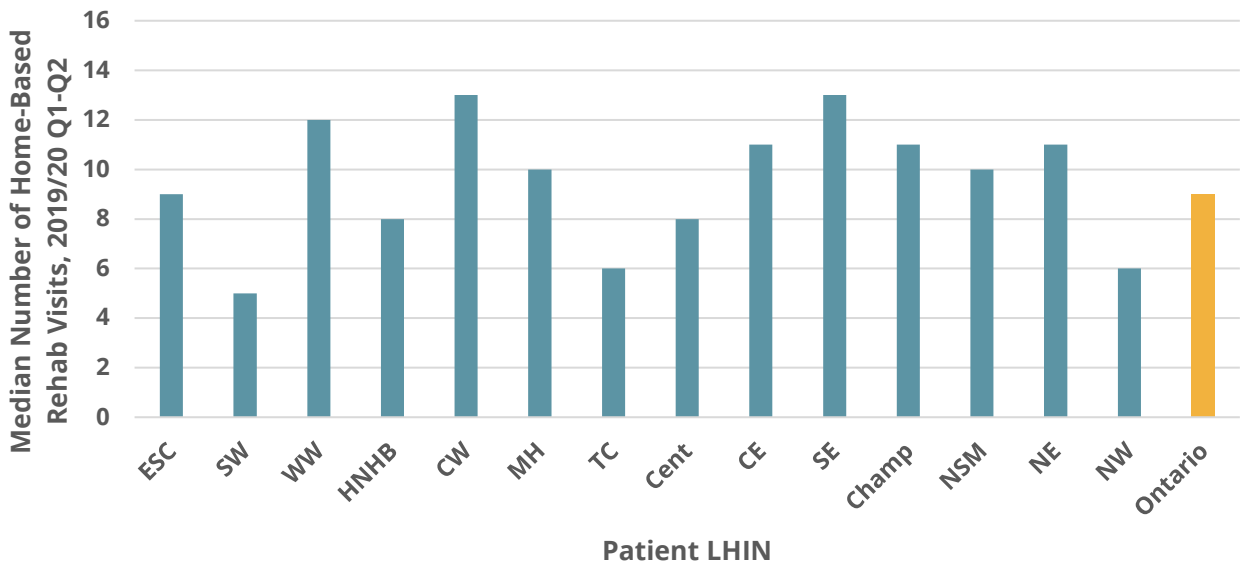
Desired directionality is high. Regions providing home-based rehab therapy where there are planned or expected breaks between therapy visits will have a longer duration; therefore, longer duration may not equate to more visits. Home-based rehabilitation provided by hospitals are not captured in the HCD (homecare database). For a listing of in-home Community Stroke Rehabilitation Programs across Ontario, see Appendix E.

Chapter 4: Post-Acute Stroke Rehabilitation Access and Timeliness
Indicator 4.7: Median Number of Home-Based Rehabilitation Visits, FY 2019/20 Q1-Q2

Indicator Description:

The number of home-based rehabilitation visits (PT, OT, SLP, and/or social work) among stroke patients who received at least 3 home-based rehabilitation visits following discharge from acute care or inpatient rehabilitation.





Interpretation Consideration:

Desired directionality is high. When reviewing the results of this indicator, take into consideration the context of the number of weeks of home-based rehabilitation duration from indicator 4.6; hence, the Ontario rate is approximately one visit per week for 9 weeks. Best practice recommends 2-5 visits per week per discipline for a minimum of 8 weeks.[10] Home-based rehabilitation provided by hospitals are not captured in the HCD (homecare database). For a listing of in-home Community Stroke Rehabilitation Programs across Ontario, see Appendix E.

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Parts of this material are based on data and/or other information compiled and provided by CIHI. However, the analyses, conclusions, opinions, and statements expressed in the material are those of the author(s), and not necessarily those of CIHI.

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Appendix A: Ontario Hospitals with Acute Specialized Stroke Programs

Ontario Hospitals with Acute Specialized Stroke Programs

Site	Regional Stroke Centre	District Stroke Centre	Stroke Unit	tPA	EVT
Bluewater Health - Sarnia General		X	X	X	
Brant Community Healthcare Sys - Brantford		X	X	X	
Brockville General Hosp			X		
Chatham-Kent Health Alliance - Chatham		X	X	X	
Grand River Hospital Corp – Waterloo		X	X	X	
Grey Bruce Health Services - Owen Sound		X	X	X	
Guelph General Hospital			X	X	
Halton Healthcare Services Corp - Oakville			X	X	
Hamilton Health Sciences Corp - General	X		X	X	X
Health Sciences North - Laurentian	X		X	X	X
Humber River Hospital - Wilson			X		
Huron Perth Healthcare Alliance - Stratford General Hospital		X	X	X	
Joseph Brant Hospital			X	X	
Kingston Health Sciences Centre - General	X		X	X	X
Lakeridge Health Oshawa		X	X	X	
London Health Sciences Centre - University	X		X	X	X
Mackenzie Richmond Hill Hospital		X	X	X	
Markham Stouffville Hospital – Markham			X		
Muskoka Algonquin Healthcare – Huntsville		X		X	
Niagara Health System - Greater Niagara		X	X	X	
Niagara Health System - St. Catherine's General			X		

Ontario Hospitals with Acute Specialized Stroke Programs

Site	Regional Stroke Centre	District Stroke Centre	Stroke Unit	tPA	EVT
North Bay Regional Health Centre		X	X	X	
North York General Hospital			X		
Orillia Soldier's Memorial Hospital			X		
Ottawa Hospital (The) - Civic	X		X	X	X
Pembroke Regional Hospital		X	X	X	
Peterborough Regional Health Centre		X	X	X	
Quinte Healthcare Corporation - Belleville		X	X	X	
Ross Memorial Hospital			X		
Royal Victoria Regional Health Centre	X		X	X	
Sault Area Hospital - Sault Ste Marie		X		X	
Scarborough Health Network - General			X		
St Thomas-Elgin General Hospital			X		
Sunnybrook Health Sciences Centre	X		X	X	X
Thunder Bay Regional Health Sciences Centre	X		X	X	X
Timmins & District General Hospital		X	X	X	
Trillium Health Partners - Mississauga	X		X	X	X
Unity Health Toronto - St. Michael's Hospital	X		X	X	X
University Health Network	X		X	X	X
William Osler Health System - Brampton (Civic)			X	X	
William Osler Health System – Etobicoke			X	X	
Windsor Regional Hospital - Ouellette Campus		X	X	X	X

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Appendix B: Abbreviations

LHIN Abbreviations used in Report

Abbreviation	LHIN
ESC	Erie St. Clair
SW	South West
WW	Waterloo Wellington
HNHB	Hamilton Niagara Haldimand Brant
CW	Central West
MH	Mississauga Halton
TC	Toronto Central
Cent	Central
CE	Central East
SE	South East
Champ	Champlain
NSM	North Simcoe Muskoka
NE	North East
NW	North West

Acute Hospital (Sites) Abbreviations used in Report

Abbreviation	Site
BWH - S	Bluewater Health - Sarnia General
BCHSYS	Brant Community Healthcare Sys - Brantford
BGH	Brockville General Hospital
CKHA - C	Chatham-Kent Health Alliance - Chatham
GRH	Grand River Hospital Corp - Waterloo
GBHS - OS	Grey Bruce Health Services - Owen Sound
GGH	Guelph General Hospital
Halton - O	Halton Healthcare Services Corp - Oakville
HHS - HGH	Hamilton Health Sciences Corp - General
HSN	Health Sciences North - Laurentian
HRH – W	Humber River Hospital - Wilson
HPHA – SGH	Huron Perth Healthcare Alliance - Stratford General Hospital
JBH	Joseph Brant Hospital
KHSC – G	Kingston Health Sciences Centre - General
LH – O	Lakeridge Health - Oshawa
LHSC – U	London Health Sciences Centre - University
MRHH	Mackenzie Richmond Hill Hospital
MSH – M	Markham Stouffville Hospital – Markham
MAHC – H	Muskoka Algonquin Healthcare – Huntsville
NHS – GNG	Niagara Health System - Greater Niagara
NHS – SCS	Niagara Health System - St. Catherine's General

Acute Hospital (Sites) Abbreviations used in Report

Abbreviation	Site
NBRHC	North Bay Regional Health Centre
NYGH	North York General Hospital
OSMH	Orillia Soldier's Memorial Hospital
TOH – C	Ottawa Hospital (The) - Civic
PRH	Pembroke Regional Hospital
PRHC	Peterborough Regional Health Centre
QHC – B	Quinte Healthcare Corporation - Belleville
RMH	Ross Memorial Hospital
RVH	Royal Victoria Regional Health Centre
SAH	Sault Area Hospital - Sault Ste Marie
SHN – G	Scarborough Health Network - General
STEGH	St Thomas-Elgin General Hospital
SHSC	Sunnybrook Health Sciences Centre
TBRHSC	Thunder Bay Regional Health Sciences Centre
TADH	Timmins & District General Hospital
THP – M	Trillium Health Partners - Mississauga
UHT – SMH	Unity Health Toronto - St. Michael's Hospital
UHN	University Health Network
WOHS – B	William Osler Health System - Brampton (Civic)
WOHS – E	William Osler Health System - Etobicoke
WRH – O	Windsor Regional Hospital - Ouellette Campus

Inpatient Rehabilitation Hospital Abbreviations used in Report

Abbreviation	Site
BCHSYS	Brantford General Hospital
BGH	Brockville General Hospital
BWH – S	Bluewater Health – Sarnia
CKHA	Chatham-Kent Health Alliance
CMH	Cambridge Memorial Hospital
EBH	Bruyere CC - Elizabeth Bruyere Hospital
GBGH	Georgian Bay General Hospital
GBHS – OS	Grey Bruce Health Services – Owen Sound
GRH – Freeport	Grand River Hospital – Freeport
Halton	Halton Healthcare Services
HDGH	Hotel Dieu Grace Healthcare
HDS	Hotel Dieu Shaver Health And Rehabilitation Centre
HGMH	Hopital Glengarry Memorial Hospital
HHS – RRC	Hamilton Health Sciences - Regional Rehab
HM	Hopital Montfort
HSN	Health Sciences North

Inpatient Rehabilitation Hospital Abbreviations used in Report

Abbreviation	Site
HPHA - SGH	Huron Perth Healthcare Alliance - Stratford General Hospital
JBH	Joseph Brant Memorial Hospital
LH – O	Lakeridge Health – Oshawa
MRHH	Mackenzie Richmond Hill Hospital
MSH	Markham Stouffville Hospital
NBRHC	North Bay Regional Health Centre
NHH	Northumberland Hills Hospital
OSMH	Orillia Soldiers Memorial Hospital
PCH	Providence Care Hospital
PRH	Pembroke Regional Hospital
PRHC	Peterborough Regional Health Centre
QCH	Queensway Carleton Hospital
QHC – B	Quinte Health Care
RMH	Ross Memorial Hospital
RVH	Royal Victoria Regional Health Centre
SAH	Sault Area Hospital
SHN – Centenary	Scarborough Health Network – Centenary Hospital
SH – Bridgepoint	Sinai Health – Bridgepoint Active Healthcare

Inpatient Rehabilitation Hospital Abbreviations used in Report

Abbreviation	Site
SJH	St. Joseph's Hospital – Thunder Bay
SJHCG	St Joseph's Health Centre Guelph
SJHC - Parkwood	St. Joseph's Health Care - London-Parkwood Institute
SHSC - SJR	Sunnybrook Health Sciences Centre - St. John's Rehab
SRHC	Southlake Regional Health Center
STEGH	St Thomas Elgin General Hospital
TADH	Timmins & District General Hospital
THP - CVH	Trillium Health Partners - Credit Valley Hospital
THP - M	Trillium Health Partners - Mississauga Hospital
TOH- Rehab	TOH - The Rehabilitation Centre
UHN - TR	University Health Network – Toronto Rehab
UHT - Providence	Unity Health Toronto - Providence Healthcare
WH	Woodstock General Hospital
WOHS-B	William Osler Health System - Brampton (Civic)
WPHC	West Park Healthcare Centre

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Appendix C: Most Responsible Stroke Diagnosis (MRDx) ICD-10CA Codes

Most Responsible Stroke Diagnosis (MRDx) ICD-10CA Codes

Stroke Type	Code	Diagnosis Description
Hemorrhagic	I60	Subarachnoid haemorrhage
Hemorrhagic	I61	Intracerebral haemorrhage
Ischemic	H341	Central retinal artery occlusion
Ischemic	I63	Cerebral infarction
TIA	G45	Transient cerebral ischaemic attacks and related syndromes
TIA	H340	Transient retinal artery occlusion
Unspecified	I64	Stroke, not specified as haemorrhage or infarction
Excluded	G454	Transient global amnesia
Excluded	I608	Other subarachnoid haemorrhage
Excluded	I636	Cerebral infarction due to cerebral venous thrombosis, non-pyogenic

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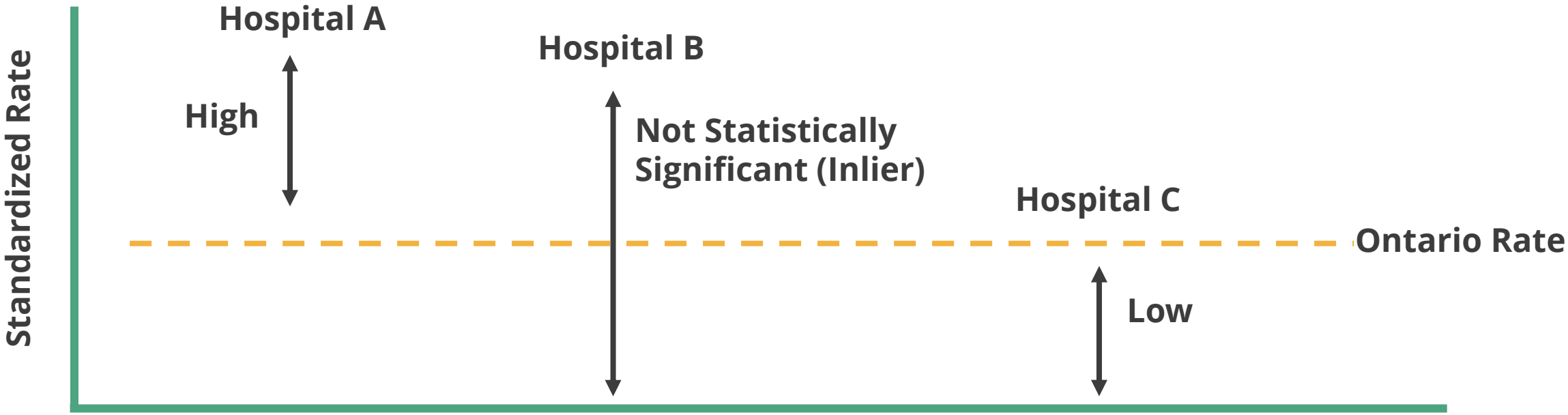
Appendix D: Interpretation of Performance Status for Standardized Indicators

Interpretation of Performance Status for Standardized Indicators



Notes:

- Arrows are 95% confidence intervals (CIs) centered around **hospital/regional** standardized rates.
- CI length is **inversely** proportional to cohort size
  - Shorter length → greater precision (trust)
  - Smaller hospitals have larger variability, and less precise data
- Outlier status is determined by comparing the Ontario rate to the hospital/regional standardized CIs. i.e. Does Ontario's rate fall inside the hospital/region's CI?

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Appendix E: In-Home Community Stroke Rehabilitation Programs

In-Home Community Stroke Rehabilitation Programs

The following list of regions has been provided to support interpretation of in-home stroke rehabilitation indicators in 2019/20. The intent is to provide insight where there are coordinated programs available that are known to offer interprofessional in-home stroke specific rehabilitation services that at a minimum include physiotherapy, occupational therapy, and speech language pathology. These programs are in addition to the usual Home and Community Care Support Services that are available in all areas in Ontario.

LHIN Regions with Hospital Based - In-Home Stroke Specific Rehabilitation Program covering all or part of their region

(Data not reported in the Home Care Database (HCD), and not included in indicator data.)

- South West
- Erie St. Clair

LHIN Regions with Home and Community Care Based - In Home Stroke Specific Rehabilitation Programs covering all or part of their region

(Data reported in the HCD and included in indicator data)

- Erie St. Clair
- Waterloo Wellington
- Hamilton Niagara Haldimand Brant
- Central West
- Central East
- South East
- Champlain
- North Simcoe Muskoka

Note: The list may not be exhaustive of all programs that offer some in-home rehabilitation and program offerings may vary within or between LHIN regions.

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Appendix F: Glossary

Glossary

Term/Acronym	Definition
ABC Benchmark Methodology	Achievable Benchmarks of Care methodology. Summarizes the performance among the highest performing facilities or sub-LHINs representing at least 20% of all patients eligible for the appropriate care.
ALC	Alternate level of care. An ALC patient is one who has finished the acute care phase of his/her treatment but remains in an acute bed. This classification is invoked when the patient's physician gives an order to change the level of care from acute care and requests a transfer for the patient.
AlphaFIM®	Standardized method of assessing patient disability/functional status in the acute care setting. AlphaFIM® is a registered trademark of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.
CCC	Complex continuing care
CIHI	Canadian Institute for Health Information
CIHI-CCRS	CIHI's Continuing Care Reporting System; contains client data collected from participating long-term care facilities and complex continuing care facilities
CIHI-DAD	CIHI's Discharge Abstract Database; captures administrative, clinical and demographic information on hospital discharges (including deaths, sign-outs and transfers). Some provinces and territories also use the DAD to capture day surgery.
CIHI-NACRS	CIHI's National Ambulatory Care Reporting System; contains data for all hospital- and community-based ambulatory care.
CIHI-NRS	CIHI's National Rehabilitation Reporting System; contains client data collected from participating adult inpatient rehabilitation facilities and programs across Canada.
District stroke centre (DSC)	A facility that has written stroke protocols for emergency services, emergency department care and acute care including transport and triage protocols; ability to offer thrombolytic therapy to suitable ischemic stroke patients; timely computed tomography (CT) scanning and expert interpretation; clinicians with stroke expertise; and linkages to rehabilitation and secondary prevention.
HCD	Home Care Database
Hospital LHIN	Examines the performance from the perspective of the hospitals within the LHIN of interest
Ischemic stroke	Stroke caused by the interruption of blood flow to the brain due to a blood clot.
LHIN	Local Health Integration Network; one of 14 not-for-profit corporations established in Ontario by the MOHLTC, each with specific geographic boundaries. Each LHIN is responsible for planning, integrating and funding local health services.

Glossary

Term/Acronym	Definition
LOS	Length of stay
LTC	Long-term care
MOH	Ontario Ministry of Health
MRDx	Most Responsible Diagnosis, the diagnosis or condition that has the greatest length of stay or greatest use of resources
ODB	Ontario drug benefit claims database
OT	Occupational therapy
PT	Physiotherapy
Patient LHIN	Examines the performance from the perspective of which LHIN the patient lives in (i.e. Patient LHIN residence)
PCCF	Postal Code Conversion File
Provincial Benchmark	Using the ABC methodology to determine which hospitals or subregions, were the highest performing and accounted for at least 20% of the population
Regional stroke centre (RSC)	A facility that has all the requirements of a district stroke centre, plus neurosurgical facilities and interventional radiology.
RPDB	Registered Persons Database; provides basic demographic information about anyone who has ever received an Ontario health card number
SLP	Speech language pathology
Stroke	Occurs when a vessel in the brain ruptures or is blocked by a blood clot.
Sub-region	Smaller subdivisions for each of the 14 Local Health Integration Networks
Telestroke	Ontario Telemedicine Network and Criticall provide stroke expertise via audio/video technology to facilities without stroke physician expertise available onsite
TIA	Transient ischemic attack or mini-stroke