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The State of Stroke Rehabilitation in Ontario: 2016 Focus Report of the Ontario Stroke Network

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Provincial Stroke Rounds March 1, 2017

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Mitigating Potential Bias

The Provincial Stroke Rounds Planning Committee mitigated bias by ensuring there was no Industry involvement in planning or education content.

To comply with accreditation requirements of the College of Family Physicians of Canada and The Royal College of Physicians and Surgeons of Canada, speakers were provided with Declaration of Conflict of Interest forms, which were reviewed by the Ontario Regional Education Group (OREG) Host member on behalf of the Planning Committee and submitted to the NOSM CEPD Office.

The Ontario Regional Education Group (OREG) Host member on behalf of the Planning Committee reviewed the initial presentation supplied by the speaker to ensure no evidence of bias.

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Faculty/Presenter Disclosure

Faculty: Dr. Ruth Hall and Dr. Mark Bayley

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- Other: None

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Objectives

At the end of this presentation, the target audience will be able to:

1. Name at least 5 areas of progress in the delivery of best practices within the Ontario stroke rehabilitation sector.

2. Discuss the impact of the report findings on system level plans for implementation of Quality Based Procedures for stroke.

3. Debate the potential options/recommendations for improving Ontario stroke rehabilitation system and rehabilitation system data monitoring

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Outline

- Context of Rehabilitative in Ontario
- Presentation of Report Findings
- Report Recommendations

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Context of Rehabilitation in Ontario

- 2013 auditor general's report criticized the province's system of rehabilitation care for its lack of coordination and inequitable access.
- Demand for rehabilitation services is expected to increase in the near future as the first of the baby boomer generation turns 75 in 2021.
- Stroke is the 2nd most common reason for admission to rehabilitation.
- Stroke rehabilitation can take place in several settings by trained rehabilitation professionals through a variety of interventions.
- The release of the two clinical handbooks for stroke QBPs, lays out the procedures and recommendations to provide evidence-based care

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OSN Rehab Special Report

Focus of report

- Current state of rehabilitation in Ontario
- What do the patients look like?
- Historical performance – over past 3 years (2011/12 – 2014/15)
- Equity lens – LHINs, sex, rurality
- Success stories

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Methods – Data Sources

1. Ontario Stroke Rehabilitation Facility Survey

Purpose:

1) Inventory of rehabilitation services (inpt and outpt)
2) Context for factors that may be associated with rehabilitative performance
3) Identify care models (inpt and outpt)
4) Evaluate stroke QBP

- Web-based
- Included sites reporting to NRS with ≥6 stroke survivors (N = 52)
- 100% completion rate
- Authors reviewed responses and only modified responses with facility approval

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Methods – Data Sources

2. CIHI –

Ontario Discharge Abstract Database (DAD)

National Rehabilitation Reporting System (NRS)

3. MOHLTC –

Home Care Database – Ontario Association of Community Care Access Centres (HCD-OACCAC)

Linked records across databases using encrypted health card numbers.

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Methods – Analyses

Stroke cohorts derived from administrative databases using ICD-10-CA codes :

H34.1, I60 (excl. I60.8), I61, I63 (excl. I63.6), I64

Age 18 years and older

Linked with encrypted health card number

Exclusions – palliative care as an initial treatment

Charlson comorbidity conditions based on two-year look back in DAD

Rurality = residing in a community with popln < = 10,000

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Methods – Analyses

Stroke cohorts sole derived from the NRS were based on RCG 1

01.1 Left body involvement (right brain)

01.2 Right body involvement (left brain)

01.3 Bilateral involvement

01.4 No paresis

01.9 Other stroke

Stroke cohorts linked to home care ;

a) post acute
b) post inpt rehab

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Methods - Indicators

Indicator	HQO Quality Domain[1]
Stroke Rehabilitation	
Proportion of stroke inpatient rehabilitation patients who received a referral for outpatient/community rehabilitation	Equitable, Effective
Length of time between stroke onset and delivery of first CCAC rehabilitation service	Timely
Length of stay (days) in rehabilitation stratified by RPG	Efficient, Equitable
Mean number of rehabilitation visits provided to CCAC patients	Efficient, Equitable
FIM ® efficiency for moderately disabled stroke patients in inpatient rehabilitation	Efficient, Equitable
Proportion of patients admitted to Inpatient rehabilitation by stroke severity (RPG)	Equitable, Appropriateness
System Integration	
Proportion of patients discharged alive from acute care and admitted to inpatient rehabilitation	Equitable
Length of time between stroke onset and admission to inpatient rehabilitation	Timely
Proportion of patients discharged alive from inpatient rehabilitation to each discharge destination: 1) Home 2) Home with services 3) Acute care 4) Complex continuing care 5) Long-term care	Equitable, Effective
Quality-Based Procedures Indicator[4]	
Proportion of adult survivors admitted to inpatient rehabilitation within 7 days of admission to acute care	Appropriateness
Proportion of patients achieving RPG target for active length of stay in inpatient rehabilitation	Efficient, Equitable

[1] Health Quality Ontario, Ministry of Health and Long-Term Care. Quality Matters: Realizing Excellent Care for All. Toronto: Health Quality Ontario; 2015. Accessed September 6, 2016 http://www.hqontario.ca/Portals/0/documents/health-quality/realizing-excellent-care-for-all-en.pdf

[4] Indicator statements are not as listed in the QBP clinical handbook; they have been modified for ease of understanding the analysis.

Note: FIM® = Functional Independence Measure; a registered trademark of Uniform Data System for Medical Rehabilitation, a division of UB Foundation Activities, Inc.

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Statistical Analyses

- 2014/15 results compared to performance 18 months prior to release of stroke QBP clinical handbook
- Sex differences
- Rurality differences
- Means and medians difference using one-way ANOVA and Kruskal-Wallis respectively
- Categorical variable differences using Chi-square test
- Trend tests using quantile regression for continuous variables & Cochran-Armitage for binary outcomes

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Context of Inpatient Rehabilitation

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Models of Rehabilitation Care

Rehabilitation Model	Description - Based on survey responses
Freestanding, stroke-focused	Rehabilitation site is geographically separate from acute care Stroke survivors co-located, rehabilitation professionals focused on stroke care Includes stroke rehabilitation units
Non-freestanding, stroke-focused	Acute and rehabilitation care is provided in the same building or does not require outdoor transportation Stroke survivors co-located, rehabilitation professionals focused on stroke care Includes integrated stroke units
Freestanding, mixed	Rehabilitation site is geographically separate from acute care Rehabilitation professionals serve multiple patient/survivor groups
Non-freestanding, mixed	Acute and rehabilitation care is provided in the same building or does not require outdoor transportation Rehabilitation professionals serve multiple patient/survivor groups
Comprehensive outpatient rehabilitation	Hospital funded/governed rehabilitation services delivered in a hospital setting that are provided by an interprofessional team (at a minimum, an OT, PT, SLP) specifically assigned to the service, using a case-coordination approach with regular team meetings and the capacity to provide 2–3 visits per week for 8–12 weeks.

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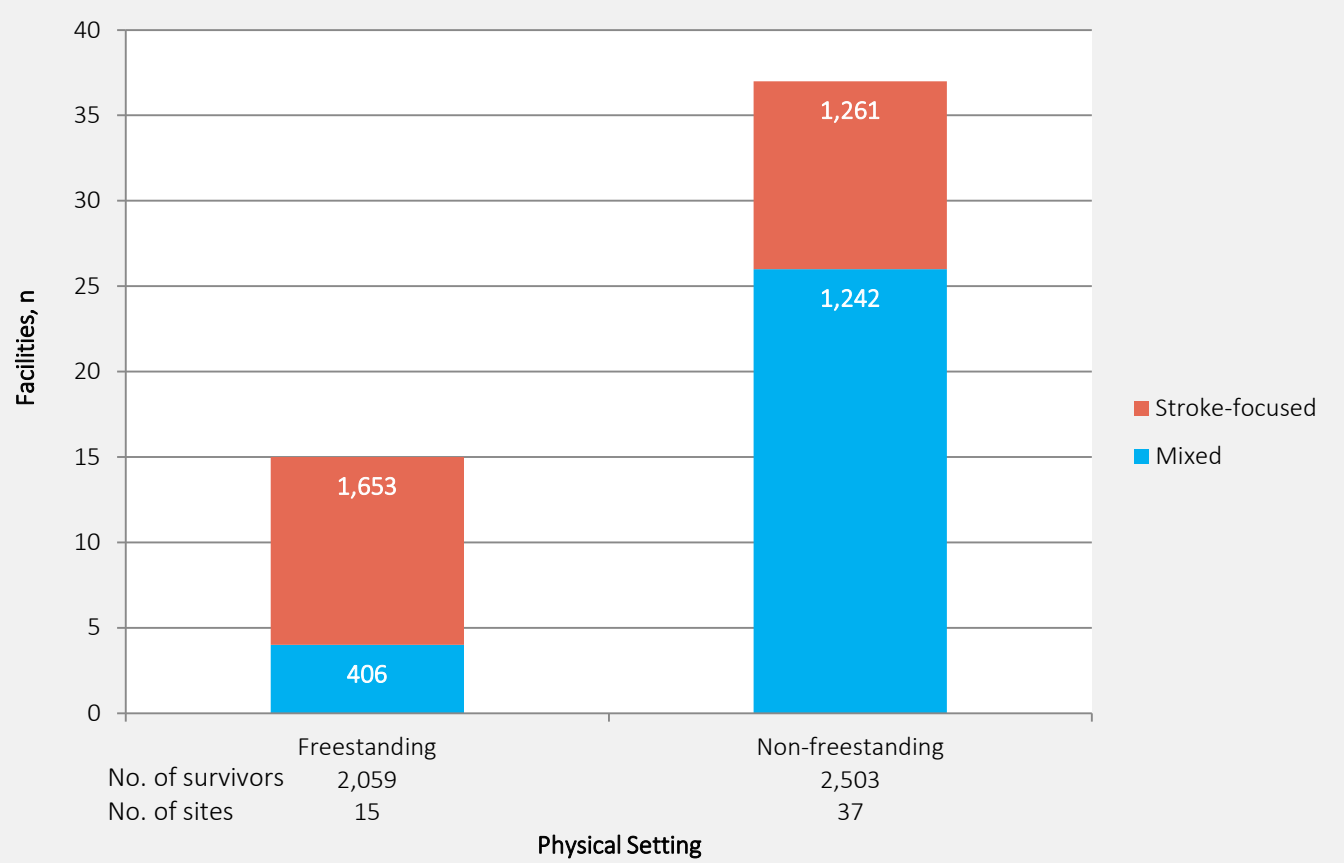
Stroke inpatient rehabilitation care models, in Ontario, 2014/15



Freestanding – Geographically separate from acute care, may or may not fall under a different corporation as affiliated acute care hospitals

Non-freestanding– Acute and rehab care is provided by same organization, in the same building, and may or may not be on different wards/units – requires indoor transportation between units.

Mixed Unit - Rehabilitation is provided to stroke patients on a rehab unit that serves multiple diagnostic groups.

Stroke - Focused Unit - Stroke patients are co-located; rehabilitation professionals are focused on stroke care.

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Characteristics of stroke survivors receiving inpatient rehabilitation, 2014/15

Characteristic	Ontario (n = 4418)
Female (%)	45.9
Median age	74
76-85 years of age (%)	29.3
> 85 years of age (%)	17
Rural residents (%)	12.4
FIM®	
Total Admission FIM® (median)	70
Total Discharge FIM® (median)	103
FIM® efficiency (median)	0.9
Disability (%)	
Mild Disability	12.5
Moderate Disability	44.7
Severe Disability	42.8
Comorbidities (%)	
Hypertension	65.7
Diabetes	32.5
Atrial Fibrillation	31.2
Hemiplegia/Paraplegia	21.9
Hyperlipidemia	18.3
Depression	8.8

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Characteristics of stroke survivors receiving inpatient rehabilitation, 2014/15

Characteristic	Ontario (n = 4418)	
	Admission	Discharge
Living Setting (%)		
Home w/o health services	85.9	28.7
Home w paid health services	7.6	41.6
Assisted Living	5.3	9.2
Residential Care	0.8	10.4
Other (boarding house/shelter or public place, other unknown, acute)	0.5	10.2
Living Arrangements (%)		
With other(s)	69.2	59.3
Alone	26.7	14.5
Care Facility	3.7	19.1
Transitional/Temporary	n/a	2.3
Acute/Unknown/Other	n/a	4.8

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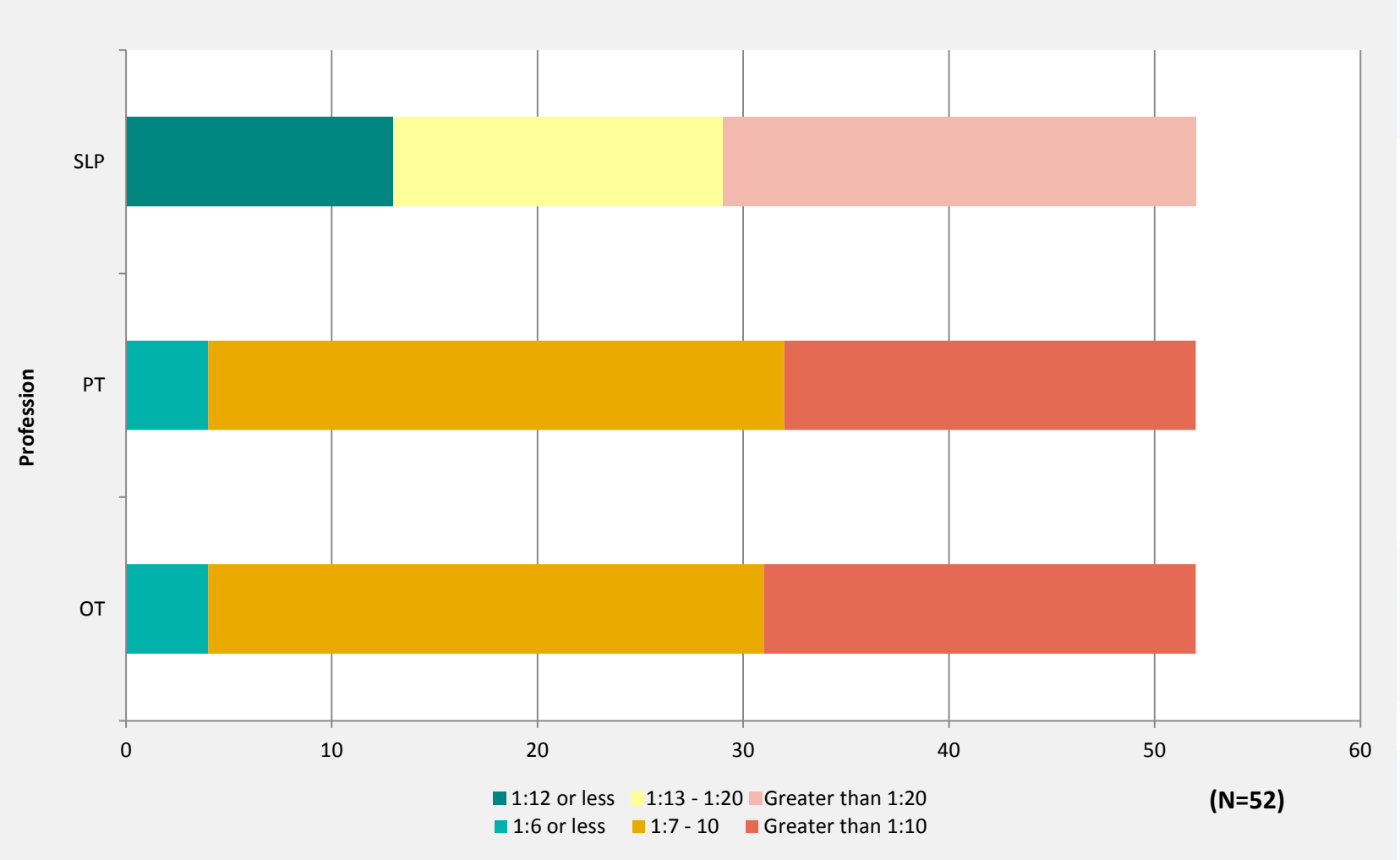
Ratio of therapists to stroke inpatient rehabilitation beds, in Ontario, 2014/15



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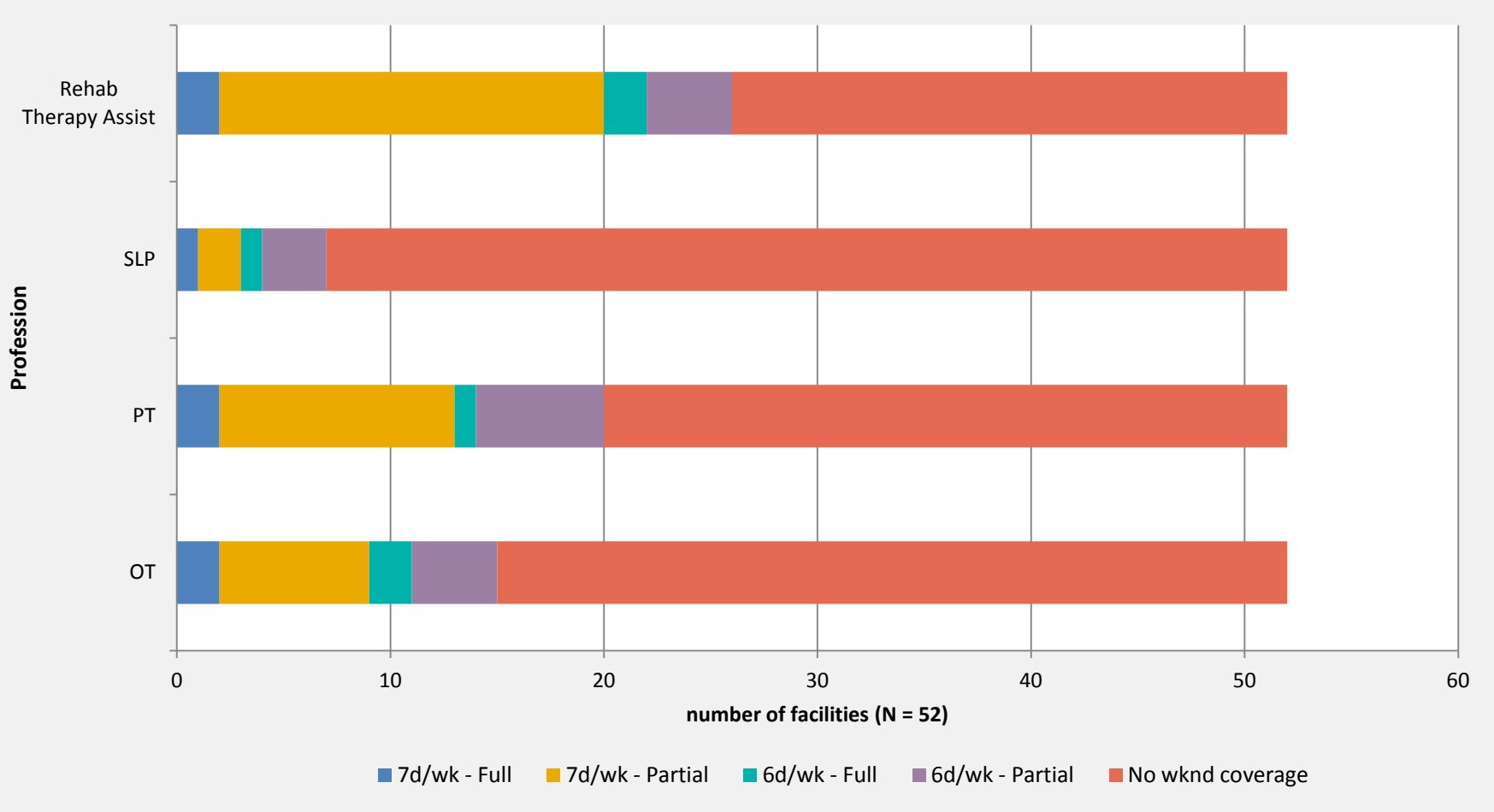
Level of therapy provided to stroke survivors on weekends by profession



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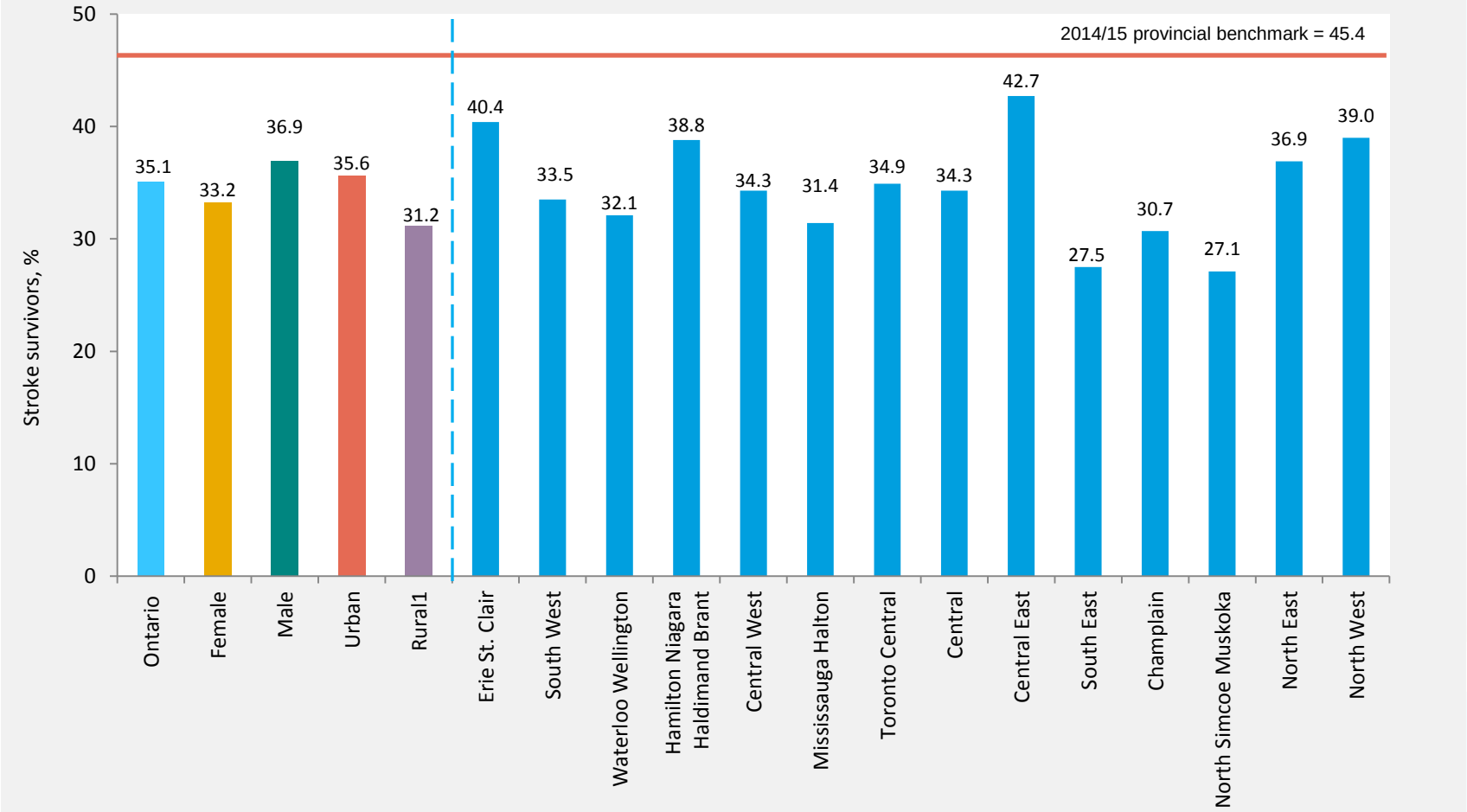
Proportion of adult stroke survivors admitted to inpatient rehabilitation, in Ontario and by sex, rurality and LHIN, 2014/15



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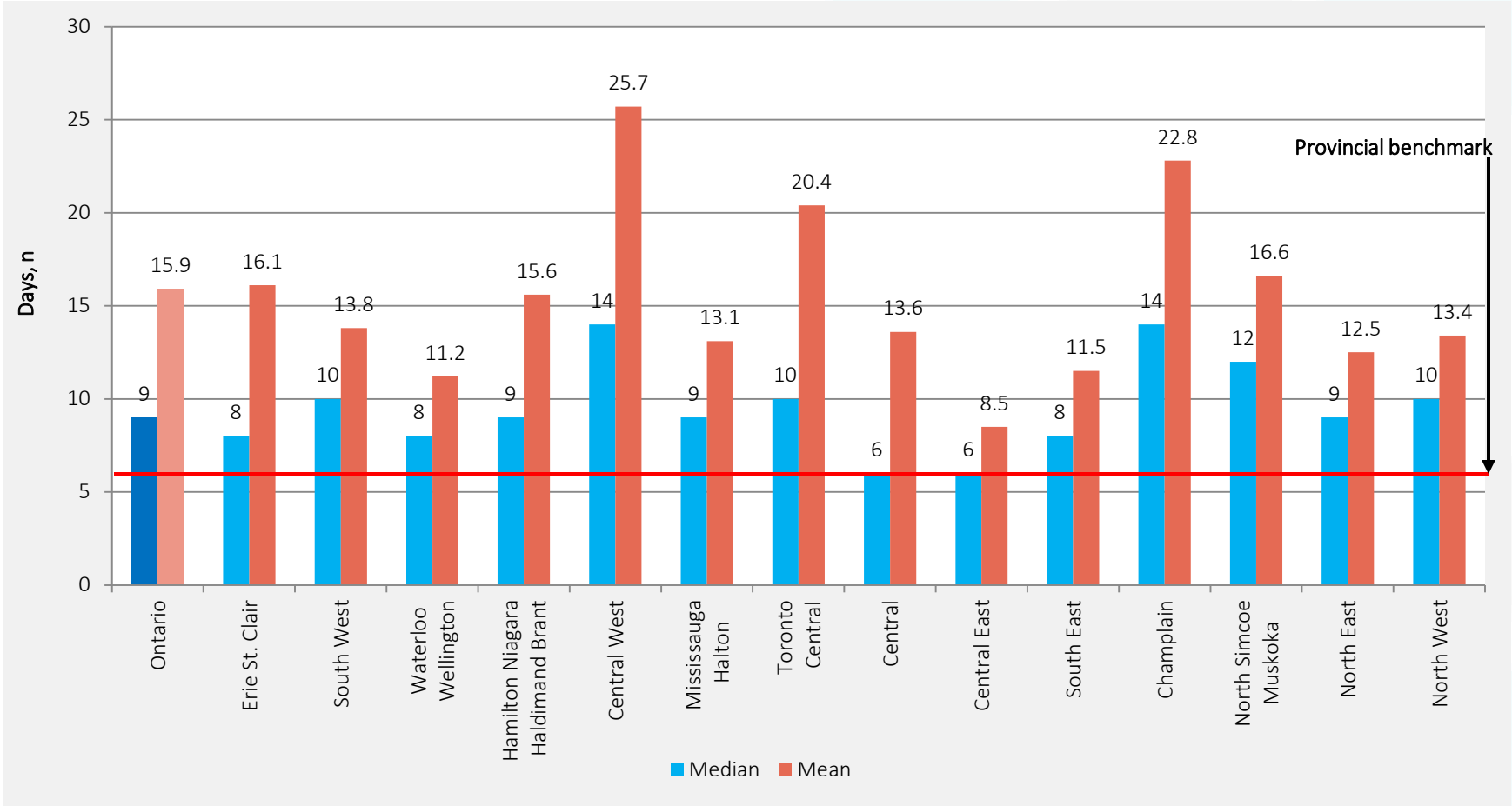
Median/mean number of days from stroke onset to admission to inpatient rehabilitation for adult stroke survivors, in Ontario and by LHIN, 2014/15



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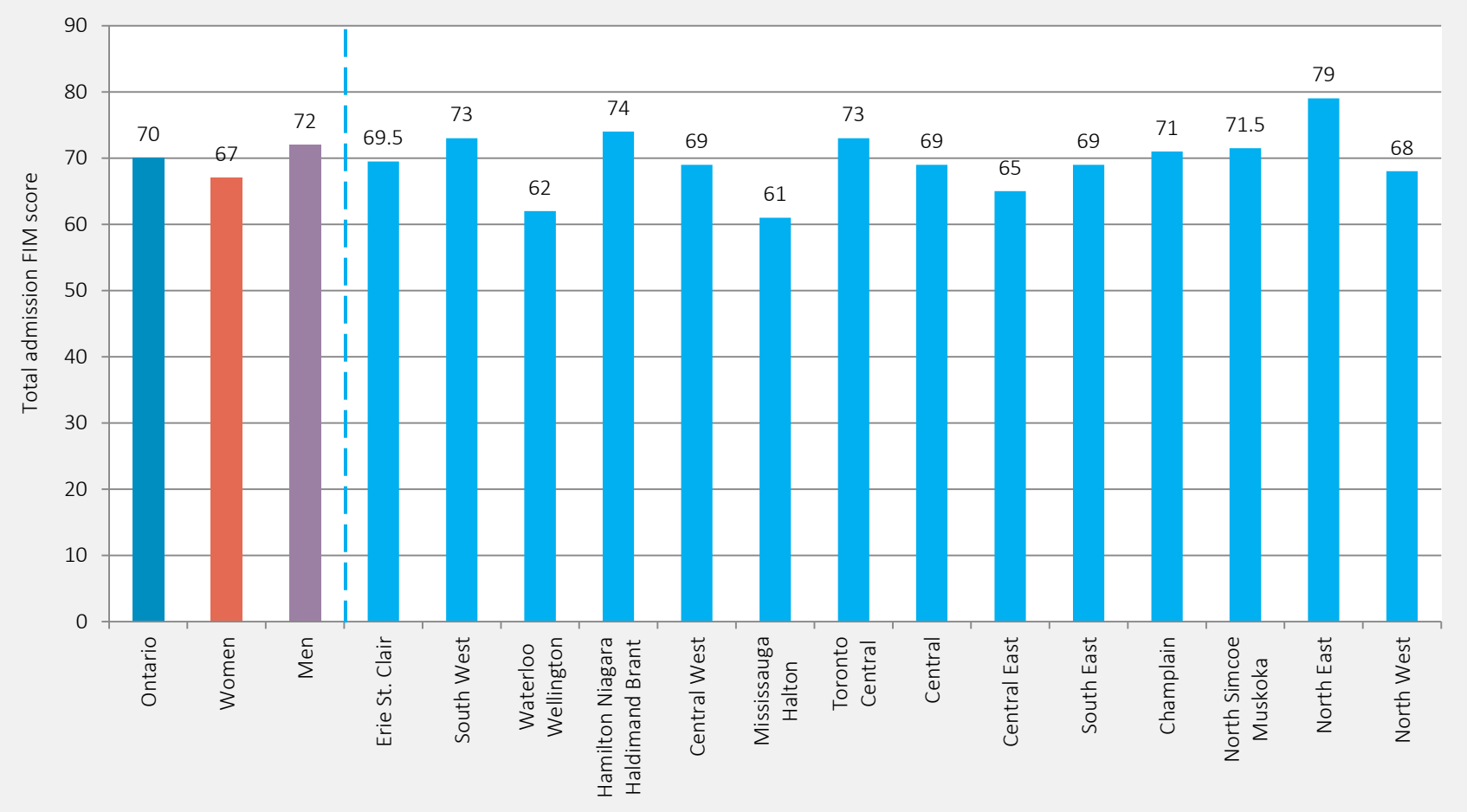
Median total admission FIM® score for stroke survivors in inpatient rehabilitation, in Ontario and by LHIN and sex, 2014/15



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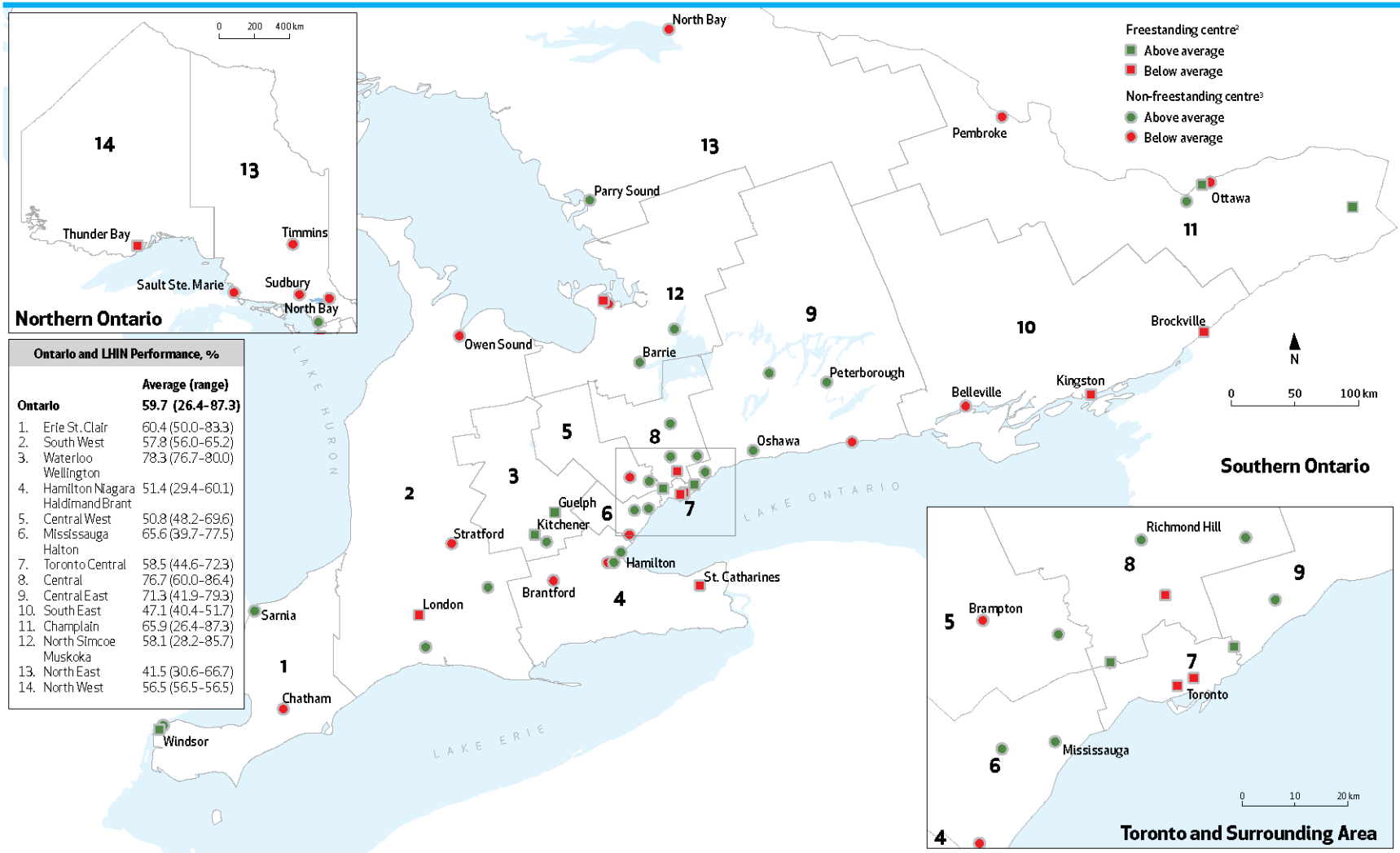
Proportion of stroke survivors achieving RPG targets for active length of stay, in Ontario, by LHIN and facility, 2014/15



Ontario and LHIN Performance, %

		Average (range)
Ontario		**59.7 (26.4–87.3)**
1.	Erie St. Clair	60.4 (50.0–83.3)
2.	South West	57.8 (56.0–65.2)
3.	Waterloo Wellington	78.3 (76.7–80.0)
4.	Hamilton Niagara Haldimand Brant	51.4 (29.4–60.1)
5.	Central West	50.8 (48.2–69.6)
6.	Mississauga Halton	65.6 (39.7–77.5)
7.	Toronto Central	58.5 (44.6–72.3)
8.	Central	76.7 (60.0–86.4)
9.	Central East	71.3 (41.9–79.3)
10.	South East	47.1 (40.4–51.7)
11.	Champlain	65.9 (26.4–87.3)
12.	North Simcoe Muskoka	58.1 (28.2–85.7)
13.	North East	41.5 (30.6–66.7)
14.	North West	56.5 (56.5–56.5)

Data source: Canadian Institute for Health Information, National Rehabilitation Reporting System (NRS), 2014/15.
Inclusion criteria: All survivors aged ≥18 years admitted to inpatient rehabilitation and classified as Rehabilitation Client Group 1 (Stroke) in the NRS database (N=4,619).
Exclusion criteria: Survivors readmitted to rehabilitation on the same day as the first rehabilitation discharge date and with a missing Rehabilitation Patient Group (RPG).

[1] Active length of stay (LOS) refers to the total time spent in inpatient rehabilitation excluding days waiting for discharge from inpatient rehabilitation and service disruptions (e.g., short readmissions into acute care) and was calculated using the admission and ready-for-discharge dates in the NRS database (active LOS = date ready for discharge – admission date). [2] Inpatient rehabilitation was within a facility physically separated from the acute stroke hospital. [3] Inpatient rehabilitation was within an acute care hospital.

Note: RPG best practice targets for active length of stay (in days) are 1100 (48.9), 1110 (41.8), 1120 (35.8), 1130 (25.2), 1140 (14.4), 1150 (7.7) and 1160 (0.0).

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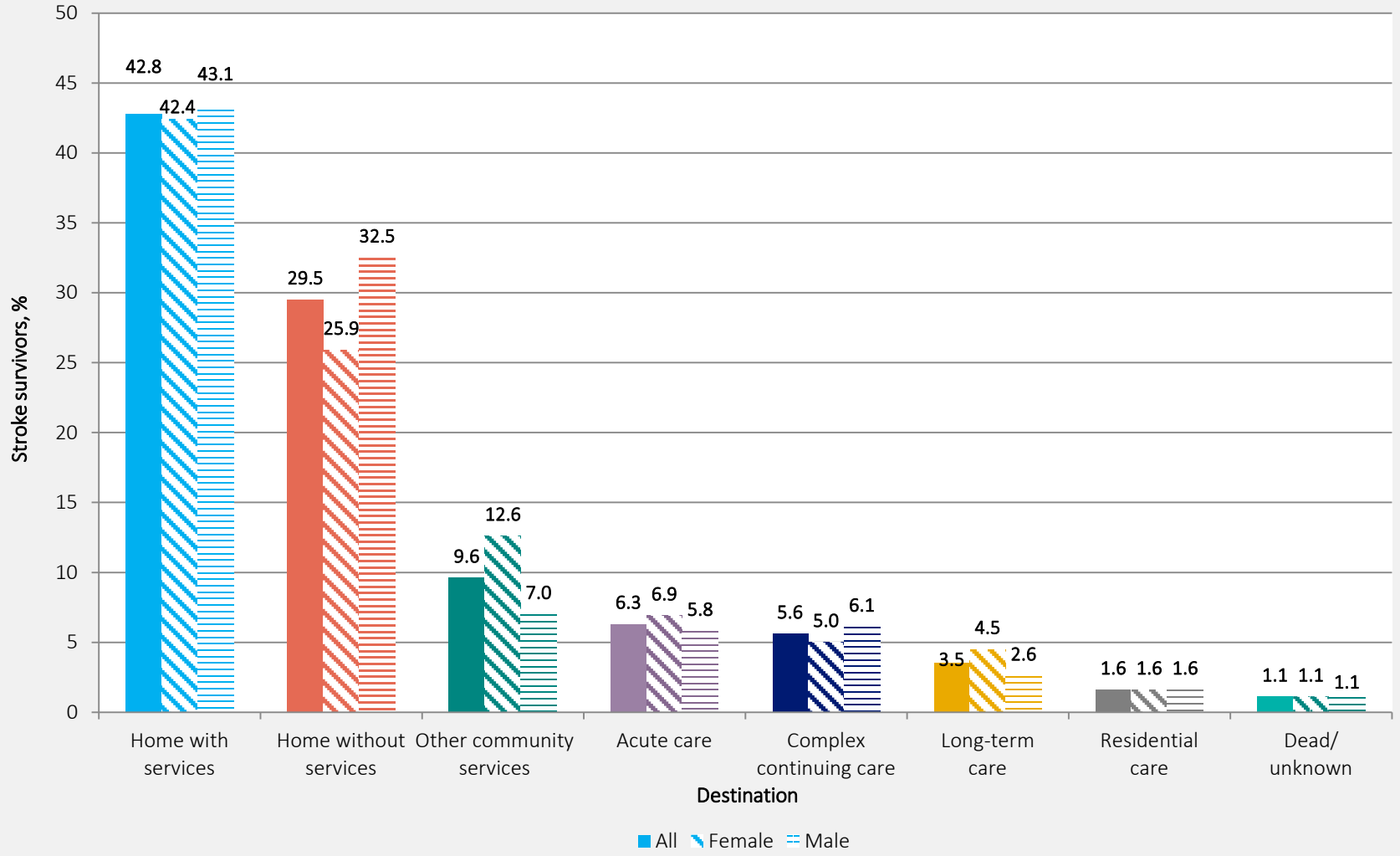
Discharge destinations of stroke survivors following inpatient rehabilitation, in Ontario and by sex, 2014/15



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Models of Care Comparison

Inpatient Stroke Rehabilitation Care Model	Freestanding, Mixed[1]	Non-Freestanding, Mixed[2]	Freestanding, Stroke-Focused[3]	Non-Freestanding, Stroke-Focused[4]
Facilities, N	4	26	11	11
Patients, N (%)	406 (8.8)	1,242 (27.2)	1,653 (36.2)	1,261 (27.6)
Mild disability,[5†] n (%)	51 (12.6)	233 (18.8)	146 (8.8)	147 (11.7)
Moderate disability,[6†] n (%)	177 (43.6)	529 (42.6)	891 (53.9)	500 (39.7)
Severe disability,[7†] n (%)	178 (43.8)	480 (38.6)	616 (37.3)	614 (48.7)
Indicators				
Median onset days to rehabilitation,[8†]	9	9	**12**	**7**
Median total admission FIM score,[8†]	67	**72**	**71**	**66**
Median active length of stay (days),[9†]	**28**	26	28	**21**
Facilities achieving the target active length of stay by RPG, %				
Overall†	**58.1**	**52.1**	61.1	**67.1**
1150 mild‡	14.6	14.4	6.5	21.6
1140 moderate	30.8	37.9	41.3	49
1130 moderate‡	58.1	54.7	65.2	70.3
1120 moderate¥	73.1	71.4	82.4	83.7
1110 severe¤	66.7	68.6	64.5	76.7
1100 severe‡	65.5	53.8	62.6	70.7
Median FIM efficiency for moderate strokes†	**1.1**	0.9	1.0	**1.1**
Discharge disposition to home with or without services,[8] %				
Overall†	**76.2**	**67.4**	**78.6**	68
Mild disability[5] ¥	93.5	91.3	96.7	96.2
Moderate disability[6]†	85.7	77.4	87.6	84.7
Severe disability[7]†	61.5	45.4	60.6	45.5

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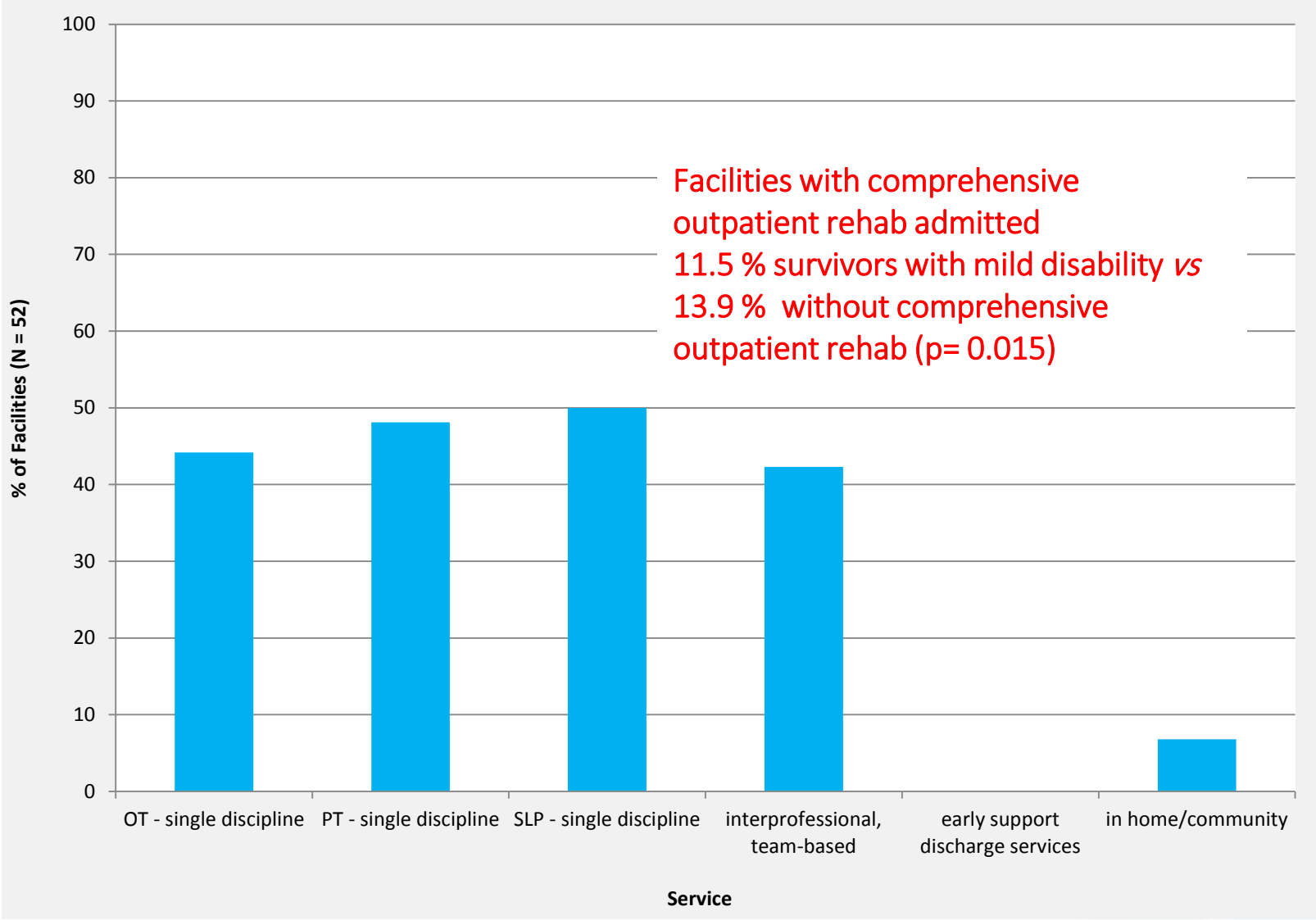
Outpatient rehabilitation services at NRS reporting facilities, 2014/15



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Objective 1:
Name at least 5 areas of progress in the delivery of best practices within the Ontario stroke rehabilitation sector.

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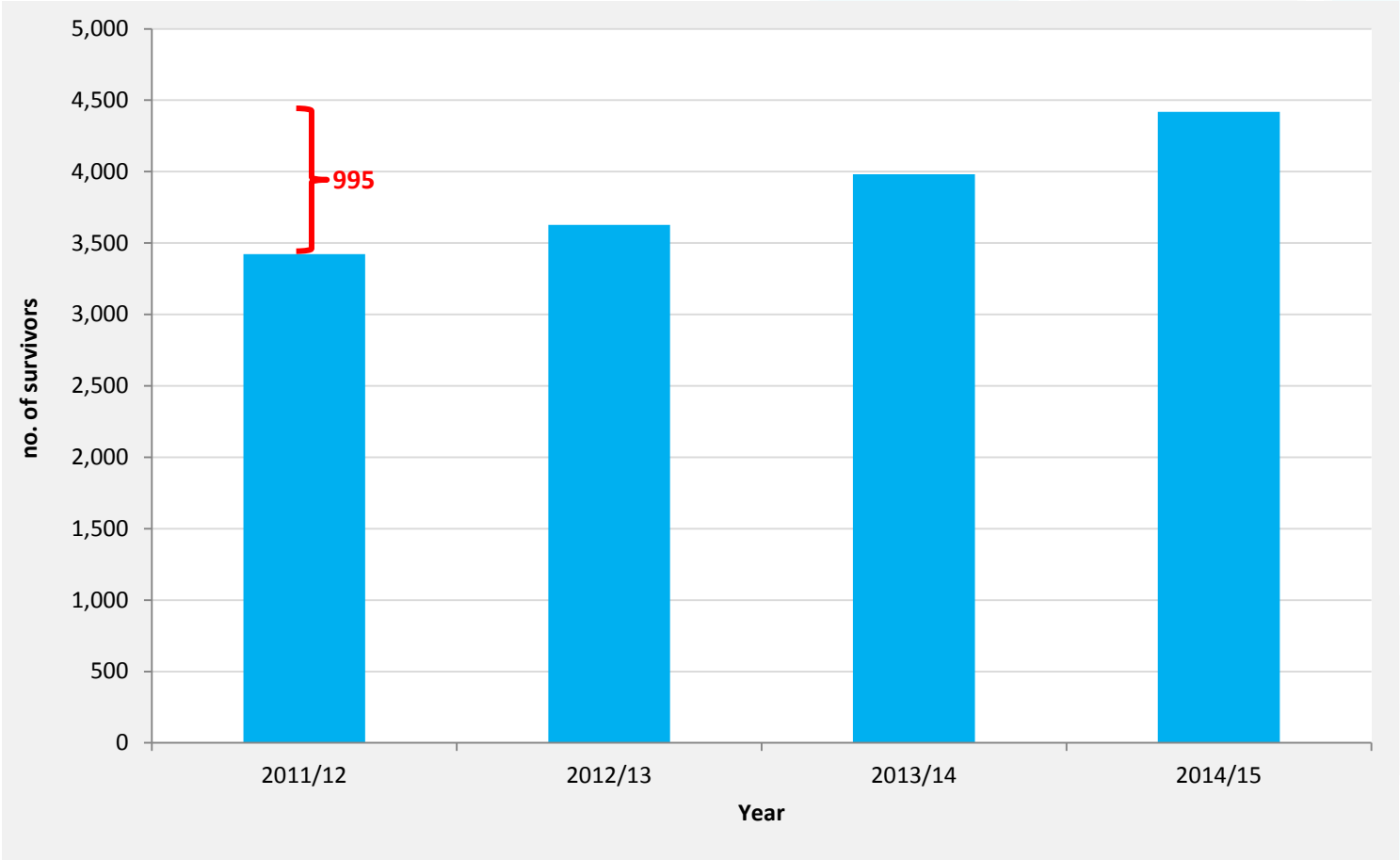
~ 1,000 more stroke survivors are accessing inpatient rehabilitation



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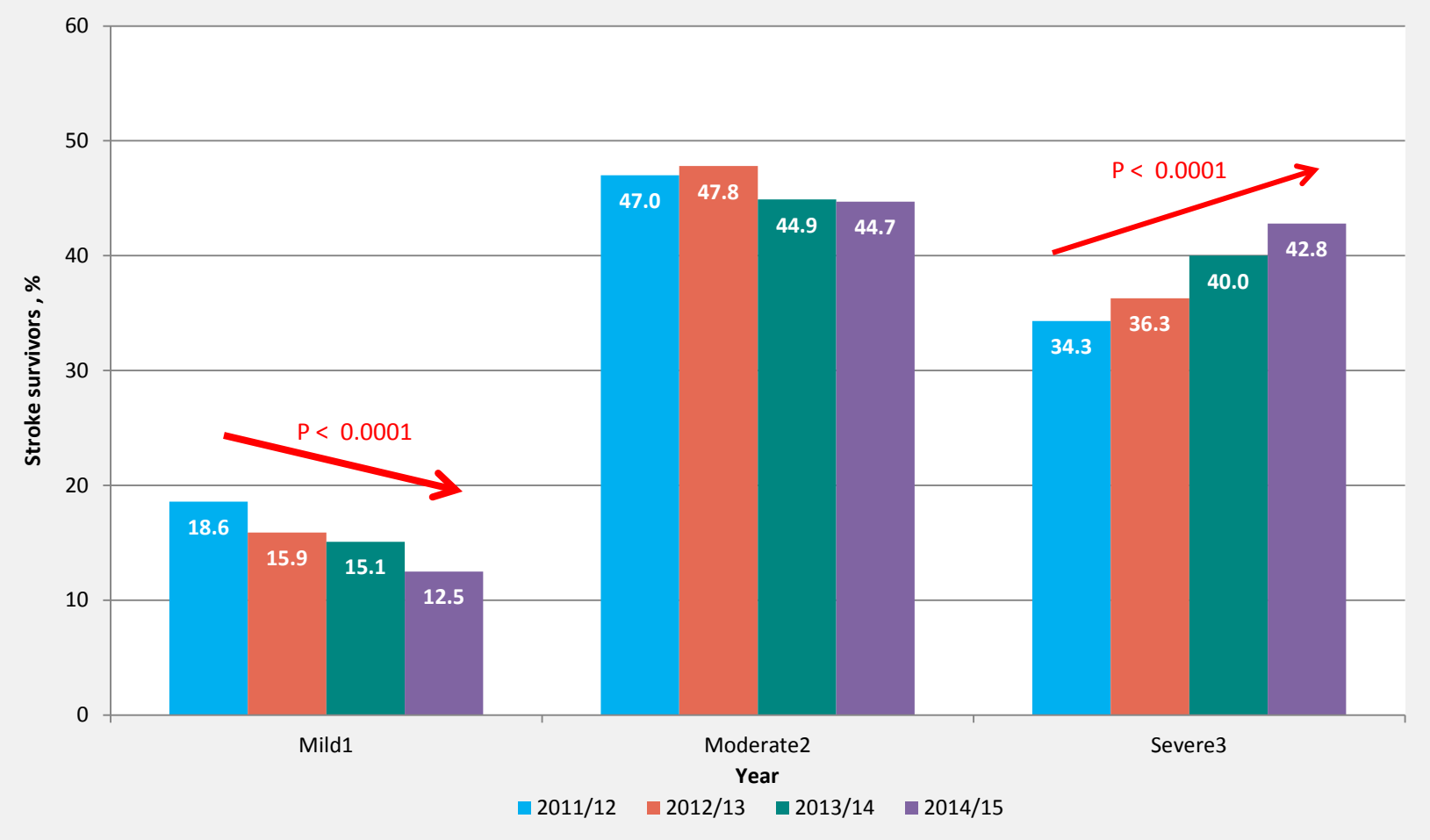
25% increase in the proportion of severe patients admitted to inpatient rehabilitation



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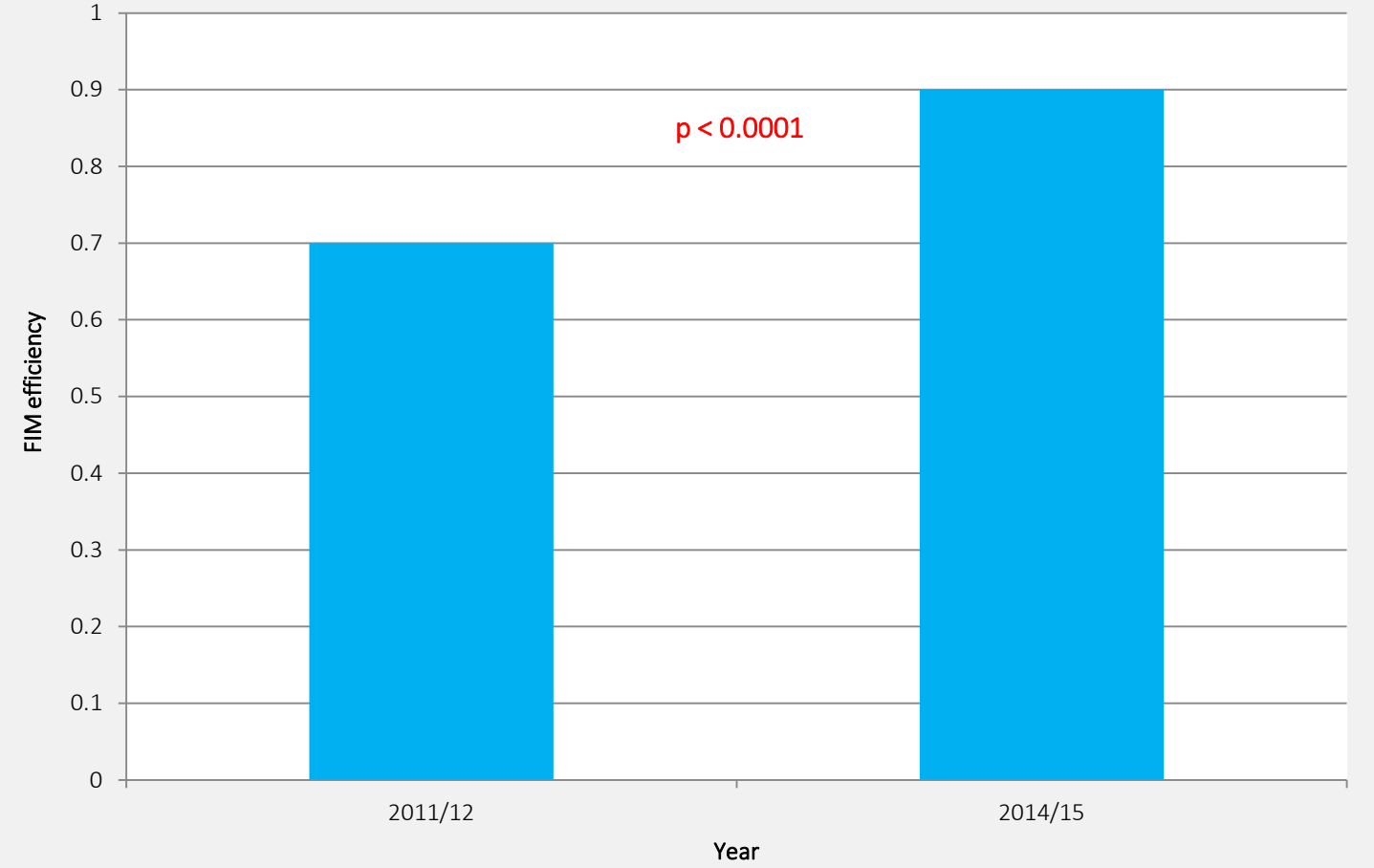
Increased daily functional gain



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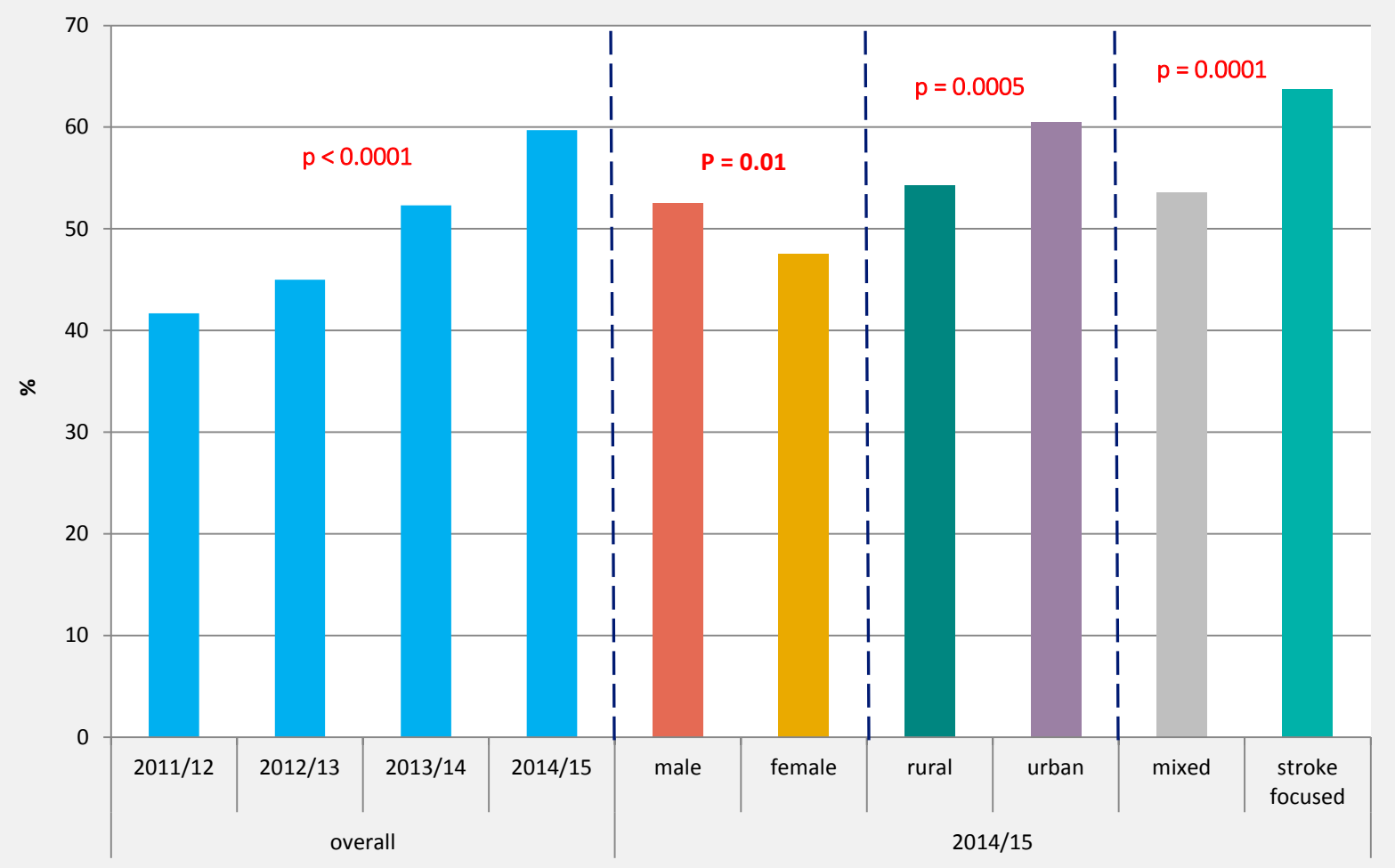
Greater percentage of survivors achieved recommended LOS targets



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Key Successes ★

Within current capacity through collaboration, innovation and efficiencies, compared to 2011/12 ……

- ~ 1, 000 more stroke survivors accessing inpatient rehabilitation
- 25% increase in proportion of severe stroke survivors accessing inpatient rehabilitation
- 29% increase in daily functional gains
- 43% increase in proportion of stroke survivors achieving RPG target LOS

…… and still getting 80% back into the community.

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What about CCAC-based rehabilitation?

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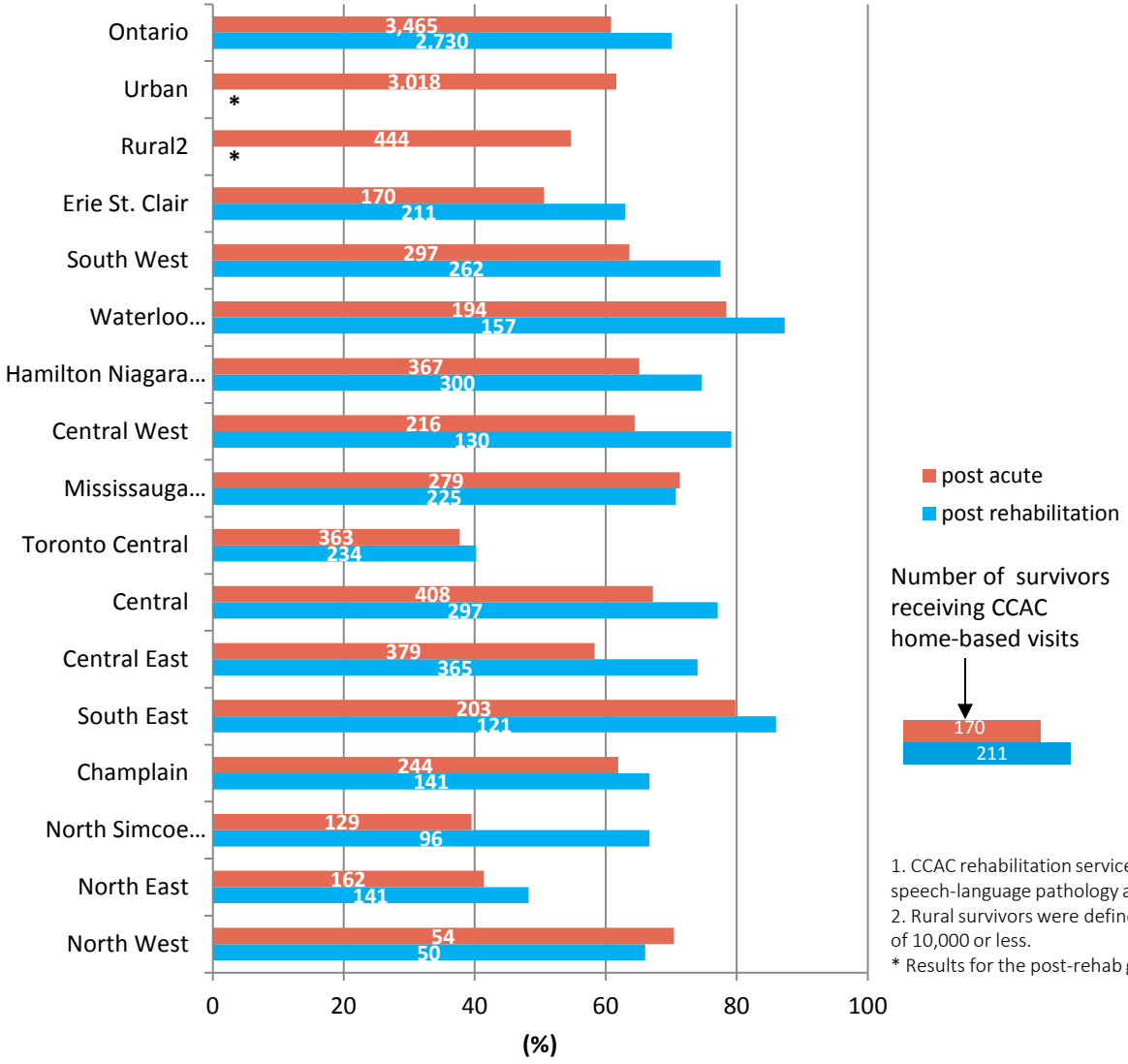
Proportion of adult stroke survivors receiving home-based CCAC rehabilitation services[1] visits following an acute stroke hospitalization or inpatient rehabilitation, in Ontario and by rurality and LHIN, 2013/14 –2014/15



1. CCAC rehabilitation services include any of physiotherapy, occupational therapy, speech-language pathology and social work.
2. Rural survivors were defined as those residing in communities with a population of 10,000 or less.
* Results for the post-rehab group were not significant.

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Characteristics of adult stroke survivors receiving home-based CCAC rehabilitation[1] services following an acute stroke hospitalization or inpatient rehabilitation, in Ontario, 2013/14–2014/15

Characteristics/Outcomes	After Acute Stroke Hospitalization (N = 2090)	After Inpatient Rehabilitation (N = 1896)
Female, n (%)	1,140 (54.5)	927 (48.9)
Age, mean (median)	75 (78)	74 (76)
76–85	706 (33.8)	621 (32.8)
>85	473 (22.6)	360 (19.0)
Rural, n (%)	241 (11.5)	262 (13.8)
Comorbidities, n (%)		
Hypertension	1,391 (66.6)	1,285 (67.8)
Diabetes	657 (31.4)	615 (32.4)
Atrial fibrillation	536 (25.6)	449 (23.7)
Hyperlipidemia	343 (16.4)	292 (15.4)
Hemiplegia or paraplegia	211 (10.1)	402 (21.2)
Dementia	209 (10.0)	80 (4.2)

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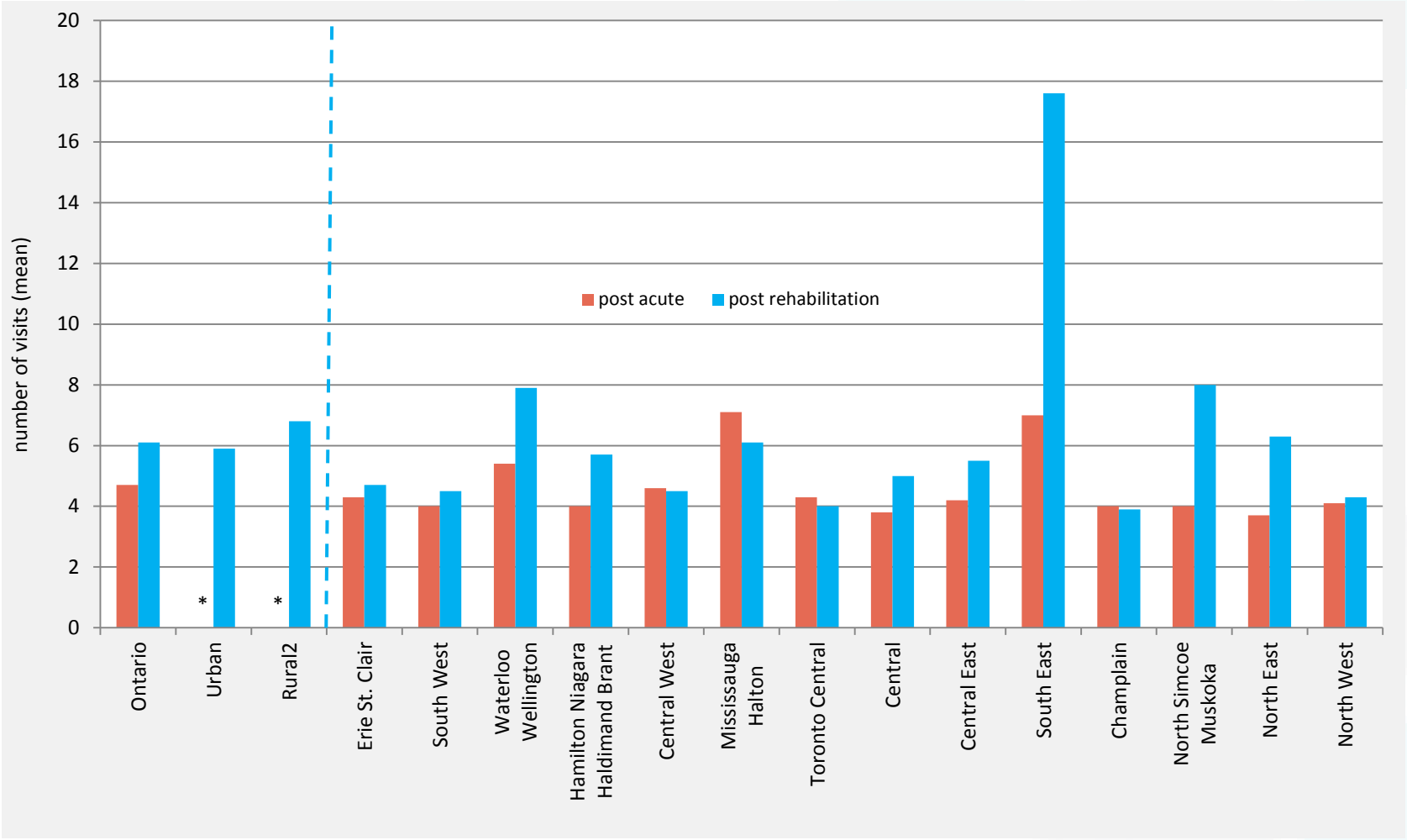
Mean number of home-based CCAC rehabilitation[1] visits provided to adult stroke survivors over 60 days following an acute stroke hospitalization or inpatient rehabilitation, in Ontario and by rurality and LHIN, 2013/14–2014/15



1. CCAC rehabilitation services include any of physiotherapy, occupational therapy, speech-language pathology and social work.
2. Rural survivors were defined as those residing in communities with a population of 10,000 or less.
* Results for the post-acute group were not significant.

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Objective 2: Discuss the impact of the report findings on system level plans for implementation of Quality Based Procedures for stroke.

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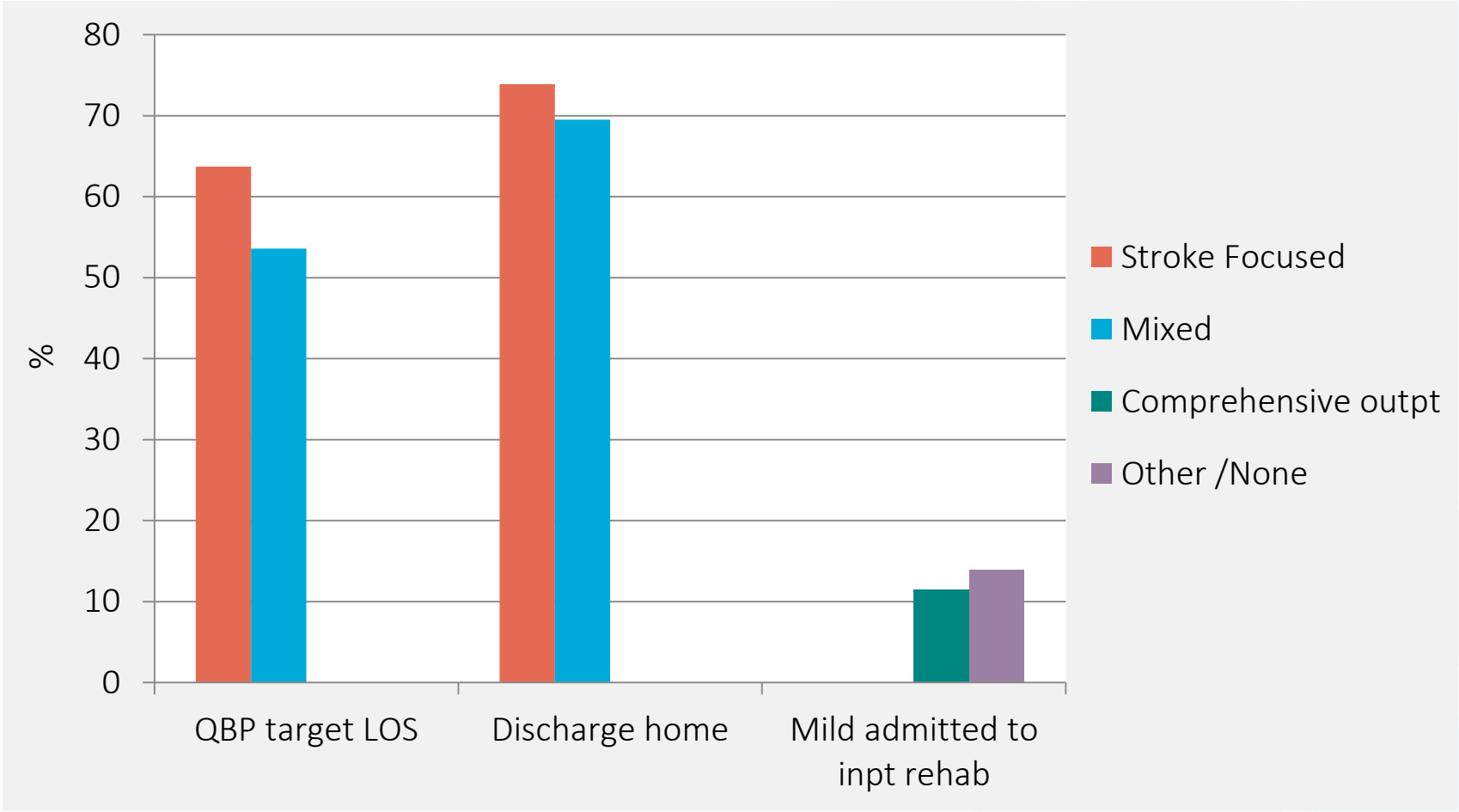
Emerging models



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Areas Identified for Improvement

- Wide LHIN variation continues
- Urban/Rural differences
- Lack of weekend and outpatient services
- Very few facilities at QBP staffing recommendations
- Home-based CCAC rehab services remain below QBP recommendations (2-3 visits per week)

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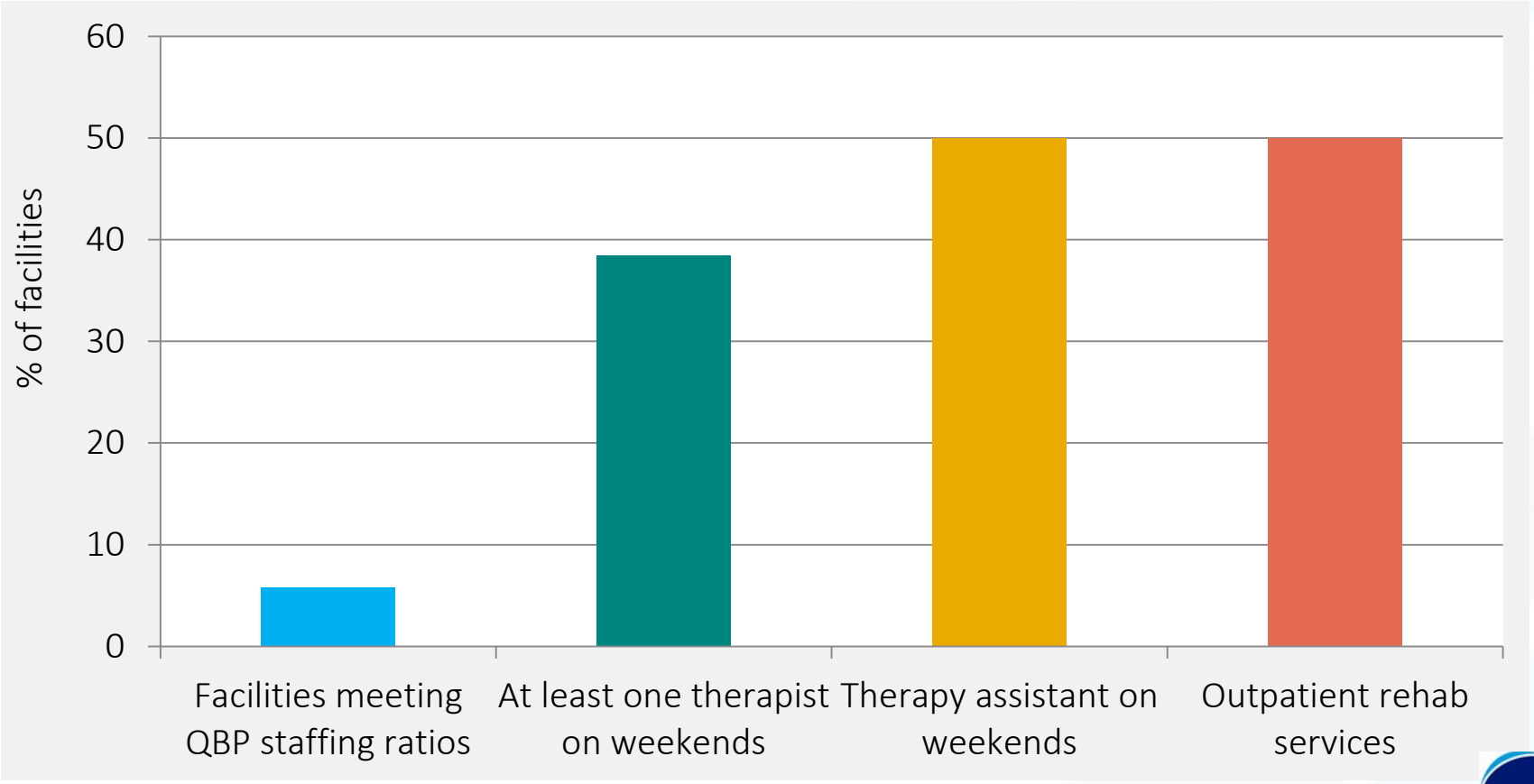
☹ Therapist staffing, weekend therapy & outpatient rehabilitation services



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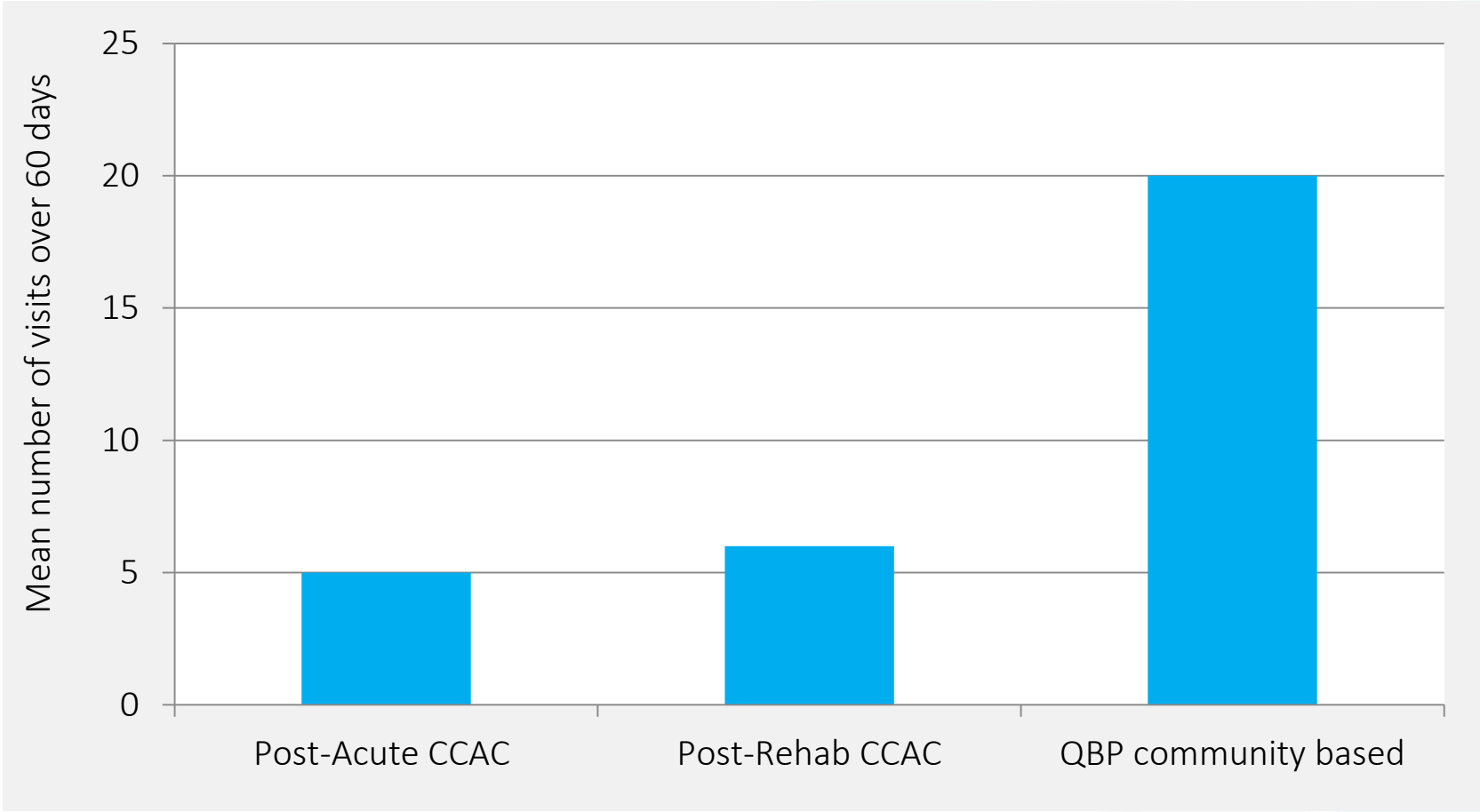
☹ Current mean number of CCAC-based rehabilitation **vs** QBP recommendation over 60 days



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Areas Identified for Improvement

Temporary DATA GAPS

- AlphaFIM – data quality issues
- Rehab intensity - data collection uptake excellent
  early data – **65 min / day**
- Outpatient rehab large gap in data

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Limitations

- Alpha FIM data insufficient to inform need for and access to rehabilitation services
- Data unavailable to measure –
  - QofL and community re-integration outcomes;
  - Effectiveness and efficiency of CCAC rehabilitation services;
  - Amount of therapy associated with optimal outcomes (minutes of one-on-one therapy)
  - Ambulatory rehabilitation services beyond CCAC-based
  - Whether observed reduction in mild strokes admitted to inpt rehab was due to access to outpt rehab
- Outcome such as death and LTC admission at one-year were not considered.

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Objective 3: Debate the potential options/recommendations for improving Ontario stroke rehabilitation system and rehabilitation system data monitoring

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Key Recommendations

1. The OSN/CCN should collaborate with MOHLTC, HQO, RSNs, and the LHINs to use the findings presented to stimulate innovation and facilitate system transformation through strategies such as integrated funding models and reorganization and regionalization of services where appropriate.
2. The OSN/CCN should collaborate with the MOHLTC, HQO, CIHI and the RCA to improve data availability and strive for consistency in quantifying rehabilitation outcomes across settings to better evaluate the system of rehabilitative care.

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Key Recommendations continued

3. The LHINs and RSNs should share and apply successes made in rehabilitation therapy in the areas of access, timeliness and level of service. Broader implementation of rehabilitation best practices should reduce observed variations in rehabilitation services among the LHINs

4. Facilities providing inpatient stroke rehabilitation should identify opportunities to align with stroke QBPs in recommended staffing ratios and evidence-based care, including the delivery of rehabilitation to stroke survivors that is early, specialized, and intensive (i.e., 3 hours per day for at least 6 days a week).

5. Acute care hospitals treating stroke patients should identify opportunities to improve processes of care, including the adoption of a consistent method of assessing patient disability (i.e., AlphaFIM) and 7-day-a-week staffing that support timely transitions, achievement of length of stay targets and reduction of ALC days.

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More Ontario stroke survivors are getting the right rehabilitative care in the right place

Stroke inpatient rehabilitative care improvements in 2014/15 compared to 2011/12:

1,000

more stroke **survivors were receiving** the **services** they needed.

25% MORE

stroke survivors with **severe disability** were **admitted**.

29% increase in stroke survivors' daily functional gains.

43% increase in the proportion of stroke survivors that met targets for active length of stay.

Over 80% of stroke survivors continued to be discharged home.

Emerging rehabilitation care models in 2014/15:

Stroke survivors admitted to facilities with **stroke-focused rehabilitation teams** were more likely to meet recommended targets for active length of stay.

Facilities with comprehensive outpatient rehabilitation services had **fewer admissions** for survivors with mild disability. Outpatient rehabilitation is a **more cost-effective setting** for mild disability.

Achieved within current capacity through collaboration, innovation and creating efficiencies

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Thank you!

Questions?

http://www.ices.on.ca/flip-publication/Ontario-Stroke-Evaluation-Report-2016/index.html

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