Ontario Stroke Evaluation Report 2018:

Stroke Care and Outcomes in Complex Continuing Care and Long-Term Care

April 2018

CorHealth Ontario
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About the Organizations Involved in this Report

CorHealth Ontario

CorHealth Ontario was formed in June 2017 following a merger of the Cardiac Care Network of Ontario and the Ontario Stroke Network. The new entity's expanded mandate spans cardiac, stroke and vascular services through the entire course of care, including secondary prevention, rehabilitation and recovery. CorHealth Ontario advises the Ministry of Health and Long-Term Care, Local Health Integration Networks, hospitals and care providers on improving the quality, efficiency, accessibility and equity of cardiac, stroke and vascular services across the province.

Institute for Clinical Evaluative Sciences

The **Institute for Clinical Evaluative Sciences** (ICES) is an independent, non-profit organization that uses population-based health information to produce knowledge on a broad range of health care issues. ICES' unbiased evidence provides measures of health system performance, a cleaner understanding of the shifting health care needs of Ontarians, and a stimulus for discussion of practical solutions to optimize scarce resources.

Key to ICES' work is its ability to link population-based health information, at the patient level, in a way that ensures the privacy and confidentiality of personal health information. Linked databases reflecting 13 million of 34 million Canadians allow researchers to follow patient populations through diagnosis and treatment, and to evaluate outcomes.

ICES receives core funding from the Ontario Ministry of Health and Long-Term Care. In addition, ICES scientists and staff compete for peer-reviewed grants from federal funding agencies, such as the Canadian Institutes of Health Research, and project-specific funds from provincial and national organizations. ICES knowledge is highly regarded in Canada and abroad, and is widely used by government, hospitals, planners, and practitioners to make decisions about care delivery and to develop policy.

Executive Summary

Of the approximately 13,000 Ontarians who survive an acute care hospitalization for stroke or transient ischemic attack each year, about 1,100 are admitted to complex continuing care (CCC) and 1,300 to long-term care (LTC) within 180 days of discharge from acute care. To date, the care provided to stroke survivors in these settings has been largely unexamined.[1-4] This report aims to address this knowledge gap by describing the sociodemographic characteristics and burden of care of stroke survivors admitted to CCC and LTC in Ontario between 2010 and 2015, the nature and extent of the rehabilitation therapy available to them, selected stroke best practices and outcomes, and their journeys through the health care system.

Characteristics of stroke survivors, 2015

- Between 2010 and 2015, the proportion of stroke survivors who were over age 85 increased from 20.7% to 23.8% in CCC and from 36.1% to 40.8% in LTC.
- Women accounted for half (50.9%) of stroke survivors in CCC and almost two-thirds (63.2%) in LTC.
- Approximately 20% of stroke survivors in CCC and 40% of stroke survivors in LTC had a diagnosis of dementia.
- Approximately 20% of stroke survivors in CCC and 25% of stroke survivors in LTC had a diagnosis of depression.
- Almost all stroke survivors in CCC and LTC required assistance with activities of daily living (79.4% and 86.3%, respectively).
- Close to 60% of stroke survivors in CCC and LTC had limitations in their ability to communicate.
- More than 45% of stroke survivors experienced bladder or bowel incontinence (respectively, 45.5% and 45.6% in CCC and 61.3% and 45.4% in LTC).

Access and journeys

- Although most stroke survivors in the cohort studied were admitted to CCC directly from an acute stroke hospitalization, the proportion decreased from 78.0% in 2010/11 to 66.0% in 2014/15. There was a corresponding increase in the proportion of stroke survivors who were provided an opportunity for intensive inpatient rehabilitation before admission to CCC and LTC, from 21.9% in 2010/11 to 34.0% in 2014/15.
- Although more than half of stroke survivors were admitted directly to LTC following an acute stroke, the proportion decreased from 61.4% in 2010/11 to 57.4% in 2014/15. The proportion of stroke survivors admitted to inpatient rehabilitation prior to admission to LTC increased from 21.5% in 2010/11 to 31.9% in 2014/15.

Rehabilitative therapy and other best practices

- Approximately 75% of stroke survivors in CCC were classified into a special rehabilitation Resource Utilization Group (RUG-III), compared to 10% of stroke survivors in LTC.
- In CCC, only 38.0% of stroke survivors received all three core rehabilitation therapies (physiotherapy, occupational therapy and speech-language therapy), 82.4% received at least two core therapies and 93.9% received at least one therapy.
- In 2014/15, stroke survivors receiving physiotherapy, occupational therapy or speech-language therapy in CCC received minimal therapy: 20, 17 and 11 minutes (median) per day, respectively.
- In LTC, no stroke survivors received all three core rehabilitation therapies, and 35.4% did not receive any core therapies.
- Stroke survivors in LTC received fewer than 10 minutes of physiotherapy per day and negligible amounts of occupational therapy and speech-language therapy.
- Between 2010/11 and 2014/15, the proportion of stroke survivors who received nursing restorative care programming decreased from 78.0% to 69.9% in CCC and from 28.5% to 11.4% in LTC. During that period, the proportion of stroke survivors receiving recreation therapy remained stable at about 30% in CCC and dropped from 8.9% to 4.3% in LTC.
- A substantial proportion of stroke survivors screened for depression exhibited low mood or signs of depression, suggesting this is a high-risk population.
- A substantial proportion of stroke survivors in CCC and LTC were assessed to have severe cognitive impairment (28.6% and 20.3%, respectively).
- Just over half (52.3%) of stroke survivors in CCC and just over one-third (38.6%) in LTC were considered to be socially engaged.
- Almost two-thirds (63.7%) of stroke survivors with atrial fibrillation who were admitted to LTC received anticoagulant medication within 90 days of discharge from acute care. Among stroke survivors with atrial fibrillation discharged from CCC, less than half (48.0%) filled their anticoagulant prescriptions in the following 90 days.
- More than a quarter of stroke survivors admitted to CCC and LTC experienced a fall (27.8% and 25.5%, respectively).

Outcomes

- Between 2010/11 and 2014/15, the average institutional time for stroke survivors admitted to CCC decreased from 132.5 days in 2010/11 to 107.7 days in 2014/15.
- The proportion of stroke survivors admitted to CCC and then discharged to the community (i.e., to independent or semi-independent living) increased from 37.8% in 2010/11 to 45.7% in 2014/15. Stroke survivors receiving inpatient rehabilitation prior to admission to CCC were more likely to be discharged to an independent or semi-independent setting compared to those admitted directly to CCC following the acute stroke event (52.4% vs 48.4%).

- Between 2010/11 and 2014/15, the proportion of stroke survivors admitted directly to CCC from acute care and then discharged to LTC decreased from 24.7% to 17.9%.

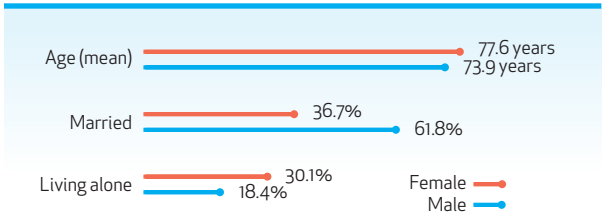
- The quality of life among stroke survivors admitted to CCC and LTC following an acute stroke was low. In 2014/15, health-related quality of life scores on a scale from −0.02 to 1.0 were 0.32 in CCC and 0.37 in LTC and remained unchanged over the study period.

- In 2014/15, one in five stroke survivors (22.0%) discharged from CCC was admitted to an acute care hospital within 30 days.

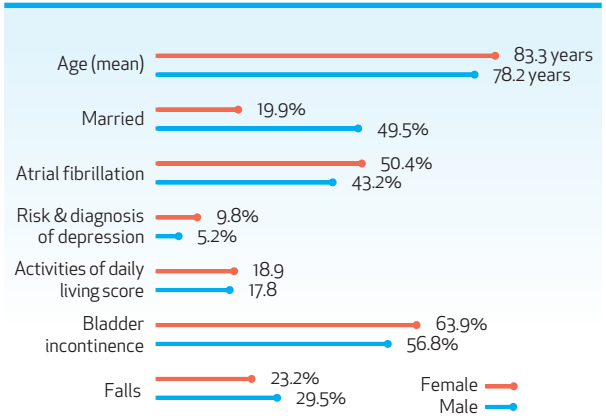
- Almost one in five stroke survivors (18.1%) in LTC died within 6 months of admission to LTC following their acute stroke or TIA.

Gender differences observed in 2014/15

- Female stroke survivors in CCC were significantly older, less likely to be married and more likely to live alone than their male counterparts.

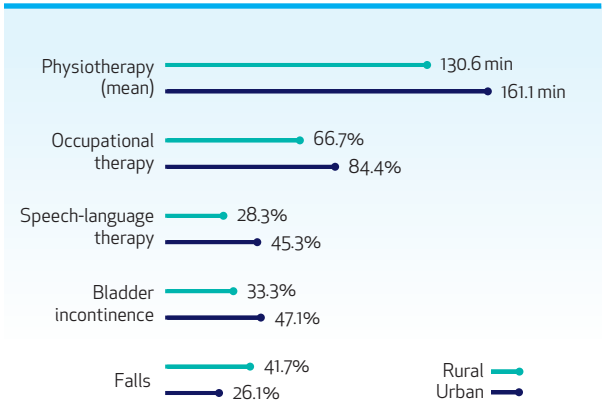


- Compared to their male counterparts, female stroke survivors in LTC were significantly older, required more assistance with activities of daily living, and were more likely to have atrial fibrillation, be at risk for and have a diagnosis of depression, and have bladder incontinence; they were less likely to be married and to experience a fall.

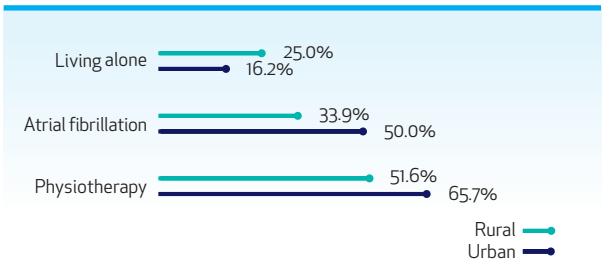


Urban/rural differences observed in 2014/15

- Compared to urban stroke survivors in CCC, rural stroke survivors received fewer minutes of physiotherapy and were less likely to receive occupational therapy or speech-language therapy, significantly less likely to have bladder incontinence and more likely to experience falls.



- Compared to urban stroke survivors in LTC, rural stroke survivors were significantly more likely to live alone and less likely to have atrial fibrillation and receive physiotherapy.



Conclusions

1. Stroke survivors in CCC and LTC settings have high care needs requiring extensive assistance with activities of daily living. Their low degree of social engagement and poor health-related quality of life are concerning.

2. Rehabilitation for stroke survivors in CCC consists primarily of physiotherapy and occupational therapy; in LTC, rehabilitation is almost exclusively physiotherapy. For both sectors, the time spent in rehabilitation therapy and recreation therapy per day is minimal, and access to physiotherapy and nursing restorative care in LTC has declined over time. Low health-related quality of life scores may be attributed to limited rehabilitation,

nursing restorative care and recreation therapy, and to depression and pain.

3. Offering stroke survivors with complex needs access to inpatient rehabilitation prior to CCC or LTC may increase their rate of discharge to the community, thereby avoiding transfer to these settings. However, for stroke survivors transferred to CCC and then discharged to the community, the high rate of hospital readmission in the 30 days following discharge warrants further investigation of underlying factors, such as the community's ability to support stroke survivors with high care needs, the effectiveness of discharge and transition planning, and the availability of social supports.

4. Stroke best practices, such as screening of mood, cognitive functioning and assessment of pain, were completed for all stroke survivors with a length of stay of more than 14 days.

5. Given that most stroke survivors in CCC were discharged prior to the 90-day quarterly RAI-MDS 2.0 assessment (the average length of stay in CCC is 80 days), there is very limited data on functional and cognitive outcomes at discharge from CCC to understand the effectiveness of rehabilitation and nursing restorative care and to determine how best to utilize CCC beds in the stroke recovery process.

6. Given the limited availability of rehabilitation and recreation therapy and the decline in nursing restorative care programing in LTC, defining the role of LTC in the stroke recovery trajectory is imperative, especially in the context of an aging population and overall health care system pressures.

7. Further research is needed to better understand the care received by stroke survivors while in CCC and LTC and the associated health outcomes. Specifically, more research is required to:

   a. Identify the factors contributing to the transfer of stroke survivors to CCC instead of admission to inpatient rehabilitation where there is greater access to rehabilitation therapy (at higher levels of intensity), interprofessional care and one-to-one goal-directed therapy.

   b. Identify the factors influencing transitions of stroke survivors from CCC and LTC to inpatient rehabilitation.

   c. Evaluate the observed difference in discharge to the community between stroke survivors admitted to inpatient rehabilitation prior to CCC compared to stroke survivors admitted directly to CCC following an acute stroke to determine if this is due to patient characteristics or other system factors such as the variation in access to and the use of inpatient rehabilitation and CCC beds across the province.

   d. Evaluate stroke survivors discharged to independent and semi-independent living to determine how long they remain in the community and identify the factors associated with hospital re-admission and admission to LTC.

   e. Examine the impact of best practice resources such as *Taking Action for Optimal Community and Long-Term Stroke Care*[5] and Stroke Care Plans for Long-Term Care[6] on care delivery, staff knowledge and quality indicator performance in CCC and LTC.

   f. Examine the implementation of Canadian Stroke Best Practice Recommendations in the CCC and LTC settings and develop stroke best practices specific to LTC that recognize the unique characteristics of LTC in the areas of funding, assessment, care delivery, staffing models, and Ministry of Health and Long-Term Care requirements and regulations.

   g. Continue to study the provision of stroke care in LTC over an extended timeframe (i.e., beyond the 90-day reassessment) using the RAI-MDS 2.0 quality indicators to measure change in health and functional status and evaluate the delivery of care in this setting.

   h. Continue to study the provision of physiotherapy in LTC (based on the data the facilities submit to the Ministry of Health and Long-Term Care in adherence with physiotherapy funding reform) to evaluate the impact on falls, activities of daily living, pain, mood, social engagement and quality of life.

i. Clarify the role of rehabilitation in the LTC setting by identifying when in the stroke recovery trajectory the focus should be on achieving optimal functional status (including processes and opportunities for reassessment if recovery occurs) and when the focus should shift to maintenance of gains or mitigation of deterioration.

Recommendations

1. The limited provision of rehabilitation to stroke survivors in CCC and LTC settings warrants review of resource allocation and models of care for rehabilitation therapy and nursing restorative care programming to inform an appropriate delivery model for these settings.

2. The findings of this report should be considered a component of CorHealth Ontario's Rehabilitation Call-to-Action.

3. Ontario's Regional Stroke Networks and the regional community and LTC coordinators should continue to work together to ensure that their activities inform and align with priorities within the LTC sector (e.g., behavioural support initiatives, fall prevention and pain management) to advance stroke best practices and staff education:

   a. Regional Stroke Networks and regional community and LTC coordinators should leverage existing stroke care resources (e.g., *Taking Action for Optimal Community and Long-Term Stroke Care*[5] and Stroke Care Plans for Long-Term Care[6]) and existing technologies (e.g., learning management systems, software solutions) and consider partnerships with stakeholders, such as the Registered Nurses Association of Ontario and its LTC best practice coordinators.

   b. LTC and CCC staff should continue to receive ongoing training in secondary stroke prevention, fall prevention, pain management and highly prevalent poststroke complications, such as bladder incontinence and depression.

   c. LTC facilities should incorporate best-practice care interventions as outlined in Stroke Care Plans for Long-Term Care[6] into their care planning libraries.

4. Local Health Integration Networks, Regional Stroke Networks and local stakeholders should continue their efforts to increase access to inpatient rehabilitation for severe stroke survivors in alignment with Canadian Stroke Best Practice Recommendations[7] and the *Quality-Based Procedures: Clinical Handbook for Stroke*.[8]

5. Local Health Integration Networks, Regional Stroke Networks and other rehabilitation stakeholders, such as the Rehabilitation Care Alliance, should continue to strengthen rehabilitation transitions of care.

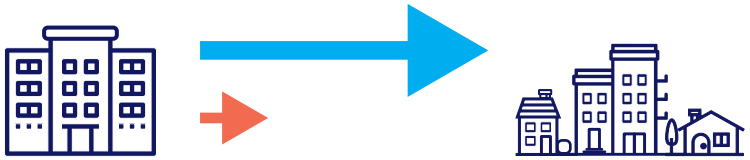
6. A standardized measurement and reporting framework for rehabilitation care, services and outcomes across settings (i.e., inpatient and outpatient rehabilitation, CCC and LTC) should be considered part of the Ministry of Health and Long-Term Care's Information Strategy 2.0. This framework should enable improved evaluation and understanding of bed utilization and the rehabilitative system of care, and be used to inform policy development, resource allocation, system planning and stroke best-practice implementation.

CARE AND OUTCOMES OF STROKE SURVIVORS

admitted to complex continuing care and long-term care in Ontario in 2015

About 1 in 5 stroke survivors are admitted to complex continuing care (CCC) or long-term care (LTC) after an acute stroke. Most don't return to the community. Access to more intensive rehabilitation might improve that outcome and optimize quality of life.

Of the **1,085** stroke survivors admitted to **CCC**, **45.7%** were discharged to the community.



Of the **1,411** stroke survivors admitted to **LTC**, **10.8%** were discharged to the community.

Characteristics of these stroke survivors

	Were over age 85	Were at risk for depression	Had severe cognitive impairment	Required extensive assistance with daily activities	Had experienced a fall	Had limited ability to communicate
CCC	23.8%	18.3%	28.6%	49.1%	27.8%	58.9%
LTC	40.8%	23.8%	20.3%	41.3%	25.5%	55.7%

Their access to rehabilitation

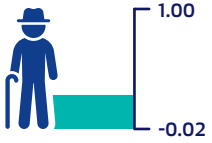
Minimal amount of core therapy for those who received any, in minutes/day

	Physical	Occupational	Speech
CCC	20	17	11
LTC	6	4	6

Proportion who received 1 or more of the 3 core therapies

	1 therapy	2 therapies	3 therapies
CCC	93.9%	82.4%	38.0%
LTC	64.6%	3.3%	0%

Their quality of life



Most rated their physical and mental health as poor.

CCC	0.32
LTC	0.37

Introduction

In Ontario, stroke patients follow one of six trajectories of care after an acute stroke or transient ischemic attack (TIA).[9] These trajectories include:

1. Emergency department to home
2. Emergency department to home with home care
3. Emergency department to acute inpatient care to home
4. Emergency department to acute inpatient care to home with home care
5. Emergency department to acute inpatient care to inpatient rehabilitation
6. Emergency department to acute inpatient care to complex continuing care or long-term care

The sixth and least common poststroke trajectory involves direct transfer to complex continuing care (CCC) or long-term care (LTC) from acute inpatient care.[9] Despite the low prevalence of this trajectory, an understanding of its various elements, including the complexity of its older stroke population and their care and rehabilitation needs, is needed to ensure optimal functional recovery and quality of life.[1,10]

There is an evolving discussion regarding the most appropriate term to use when referring to individuals who are living with the effects of stroke and receiving care in CCC or LTC. Examples include *stroke survivors, persons with stroke, stroke patients* (in CCC) or *residents with stroke* (in LTC). For the purposes of this report, the term *stroke survivors* is used as it is relevant to both the CCC and LTC settings and is consistent with language used in the 2016 Ontario stroke evaluation report.[11]

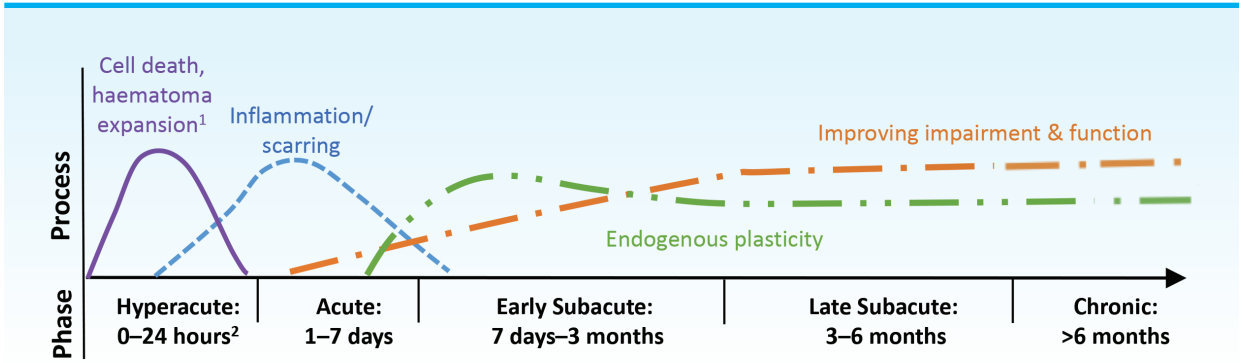
Previous evaluation reports prepared by the Ontario Stroke Network highlighted variation in the proportion of stroke survivors admitted to CCC and LTC facilities following their acute stroke event.[1,11-13] In the 2012 Ontario stroke evaluation report,

selected characteristics of stroke and TIA patients admitted to CCC and LTC following an acute event were reported for the first time.[1] Following the release of the 2012 report, regional community and LTC coordinators made a recommendation to the Ontario Stroke Evaluation and Quality Committee that a further report should focus on the CCC and LTC sectors, and this recommendation was adopted by the committee. The 2016 Ontario stroke evaluation report, which focused on stroke rehabilitation, recommended a focused evaluation of stroke care in the CCC setting to better understand the profile of stroke survivors, the care and services provided to them and the outcomes they achieved.[11]

The intent of this 2018 stroke evaluation report is to inform system planning, facilitate and advocate for system change, and identify opportunities for quality initiatives and research. This will be achieved through a better understanding of (1) the characteristics of stroke survivors, (2) the burden of stroke care, (3) access and patient flow, (4) the nature of therapy and other stroke care best practices in CCC and LTC settings and (5) stroke survivor outcomes.

The Stroke Recovery and Rehabilitation Roundtable proposed five time periods where recovery and repair occur following an acute stroke and defined true recovery as the return of some or all of the normal repertoire of behaviours that was available before the injury, in this case, the acute stroke (see Exhibit A).[14] This report focuses on three phases of poststroke care – the early subacute (7 days to 3 months), the late subacute (3 to 6 months) and the chronic (more than 6 months) – and updates and expands on the findings included in previous Ontario stroke evaluation reports.[1,13]

EXHIBIT A Framework of critical timepoints poststroke linked to current knowledge of the biology of recovery. [From Bernhardt et al. *Int J Stroke*. 2017; 12(5):444–50.]



[1] Haemorrhagic stroke specific. [2] Treatments extend to 24 hours to accommodate options for anterior and posterior circulation, as well as basilar occlusion.

The vast majority of stroke survivors require rehabilitation across the continuum of care to achieve their optimum level of functioning. In Ontario, stroke survivors receive inpatient rehabilitation in general rehabilitation units, integrated stroke units and specialized stroke rehabilitation units. However, historically, stroke survivors with more severe impairments who were deemed unable to tolerate the intensity of an inpatient rehabilitation setting but could benefit from rehabilitation were transferred to rehabilitation programs that provided lower frequency or intensity of rehabilitation in the CCC setting (i.e., low tolerance long duration or slow stream rehabilitation programs).[3,9,15,*] Access to and the amount of rehabilitation provided through these programs and their utilization within the stroke recovery trajectory varies across the province.[16,**]

Stroke survivors who return or are transitioned to LTC following their acute stroke are in either the early subacute or late subacute phase of their recovery, yet they receive minimal rehabilitation (physiotherapy, occupational therapy and speech-language therapy) and recreation therapy services in this setting.[1] Physiotherapy constitutes the majority of the rehabilitation therapy provided, and

* The Rehabilitation Care Alliance's Definitions Frameworks (2015) establish standard definitions and criteria for bedded and community-based care. Within the CCC setting, rehabilitation programs are defined as rehabilitation, activation/restoration, and short-term or long-term complex medical management. The findings of this report focus on the period from 2010 to 2015, which precedes the introduction of the standardized definitions.

** The number of CCC beds ranged from 49 in the Central West LHIN to 1,730 in the Toronto Central LHIN (personal communication with Imtiaz Daniel, Ontario Hospital Association, January 2018).

it may be delivered by in-house or contracted service providers. Occupational and speech-language therapy services may be available on a limited basis from the LHIN Home and Community Care Program or purchased privately by stroke survivors and their families.

This report focuses on stroke survivors admitted to CCC and LTC in Ontario between April 2010 and September 2015. It evaluates these two sectors of the stroke care continuum using data from the Canadian Institute for Health Information, including the Discharge Abstract Database and the Continuing Care Reporting System, which covers both CCC and LTC.

This report has the following objectives:

- provide detailed information on the burden of stroke care, access to rehabilitation and delivery of stroke best practices and outcomes in Ontario's 117 CCC facilities and 637 LTC facilities;[17]
- inform system-level planning for stroke care services in the CCC sector, including utilization of CCC in the stroke care continuum;
- inform system-level planning for LTC transformation initiatives, specifically those related to delivery of best practice care, access to rehabilitation and restorative services, utilization of resources, outcomes and quality of life; and
- identify areas for further research to better understand the complex care needs of stroke survivors and the delivery of care and utilization of resources in the CCC and LTC sectors.

Data Sources and Methods

Data Sources

A number of data sources, all held at ICES, were used to prepare this report.

- From the Canadian Institute for Health Information: The stroke cohort was created by linking data from the Discharge Abstract Database (CIHI-DAD) to the Continuing Care Reporting System for Complex Continuing Care (CCRS-CCC) and for Long-Term Care (CCRS-LTC), made available in January 2017, and the National Rehabilitation Reporting System (CIHI-NRS), made available in December 2016.
- From the Ontario Ministry of Health and Long-Term Care: Population and demographic information was obtained from the Registered Persons Database (RPDB), made available in August 2017. Drug prescription information was obtained from the Ontario Drug Benefit (ODB) claims database, made available in August 2017.
- From Statistics Canada: Population data were obtained from the 2006 Census.

Encrypted Ontario health card numbers were used to link patients diagnosed with stroke across the various health administrative databases.

Both the CCRS-CCC and CCRS-LTC databases use the Resident Assessment Instrument – Minimum Data Set 2.0 (RAI-MDS 2.0). This data set includes resident demographics; clinical status; physical, cognitive and social functioning; as well as pain, medication use, falls and discharge disposition.[18] The clinical, physical, mental and social functioning of residents was assessed using the RAI-MDS 2.0 within 14 days of their admission to CCC or LTC and reassessed every 90 days, or sooner if there was any significant change in the resident's health status. The RAI-MDS 2.0 includes several validated scales to capture resident health status and functioning.

Ethics

This study was approved by the institutional review board at Sunnybrook Health Sciences Centre in Toronto, Ontario.

Methods

Stroke cohorts

Stroke cohorts were generated from health administrative databases using codes from the International Classification of Diseases, 10th Revision, Canada (ICD-10-CA). These codes include G45 (excluding G45.4), H34.0, H34.1, I60 (excluding I60.8), I61,I63 (excluding I63.6) and I64.

The most responsible diagnosis was used to identify stroke records in the CIHI–DAD for adults aged 18 years or older and living in Ontario. Exclusions from the CIHI-DAD include cases with missing discharge date/time or length of stay, and cases identified as elective admissions or that had an in-hospital stroke, palliative care as an initial treatment (Z51.5 with the prefix 8), or who died in hospital. Stroke cohorts derived from the CIHI-DAD were linked to the CCRS-CCC and CCRS-LTC databases to define two stroke survivor cohorts.

CCC and LTC survivors were identified for inclusion if they had a full RAI-MDS 2.0 assessment within 180 days of their DAD discharge. They were excluded if their length of stay in CCC or LTC was less than 14 days, as RAI-MDS 2.0 assessments are not required for that duration.

The length of time from acute stroke discharge to admission to CCC at the 25th, 50th and 75th percentiles was 0, 0 and 40 days, respectively. The length of time from acute stroke discharge to admission to LTC at the 25th, 50th and 75th percentiles was 0, 30 and 90 days, respectively.

These linked cohorts were created to evaluate stroke survivor clinical and functional status, access to rehabilitation, best practice care and outcomes.

Analyses

Stroke survivor characteristics were determined by using an encrypted health card number to link the acute stroke event captured in the CIHI-DAD to the CIHI CCRS-CCC and CCRS-LTC based on RAI-MDS 2.0.

Reporting on the clinical status of stroke survivors in CCC and LTC settings was derived from RAI-MDS 2.0 outcomes scales. These scales were chosen based on their alignment with:

- LTC indicators identified for public reporting by Health Quality Ontario, including antipsychotic medication use without a diagnosis of psychosis, physical functioning (activities of daily living), depression, behavioural symptoms, pain and falls.[19]
- Canadian Stroke Best Practices Recommendations, which include the sections on managing stroke transitions of care; mood, cognition and fatigue; and delivery of inpatient rehabilitation.[20]
- the work of stakeholders such as the Rehabilitation Care Alliance and the Long-Term Care Best Practices Program of the Registered Nurses Association of Ontario.

Another consideration is the impact of multimorbidity on the overall health and functional status of stroke survivors in CCC and LTC, using the Minimum Data Set Health Status Index (MDS-HSI) as a measure of health-related quality of life (HRQL)

Demographic information

Demographic information included age, sex, marital status, and living arrangement prior to admission. The survivor's postal code was linked to the Postal Code Conversion File Plus (PCCF+, Statistics Canada) for neighbourhood income quintile and determination of place of residence (rural or urban) information. Rural was defined as residing in a community with a population of 10,000 or less.

Resource Utilization Group categories

Resource Utilization Group, version III (or RUG-III) is a grouping methodology used in CIHI's CCRS databases to categorize specific resident groups based on statistical, clinical and resource utilization properties.[21] The RUG-III categories can be used to support planning, resource allocation and quality improvement. There are two versions: the RUG-III 34-group and the RUG-III 44-group. The 34-group is used only in Ontario LTC facilities, whereas the 44-group is used nationally. However, the main difference between the two versions is the special rehabilitation category. In the 44-group, there are 4 rehabilitation groups with five subcategories,

compared to only four rehabilitation groups and no subcategories in the 34-group.[21] Both groups use the Activities of Daily Living (ADL) score and the three core rehabilitation therapies (physiotherapy, occupational therapy and speech-language therapy), as well as nursing rehabilitation/restorative care.[21]

Clinical status and best practice care

Information about survivor clinical status was determined from a number of validated outcome scales and specific variables derived from the Continuing Care Reporting System and the Resident Assessment Instrument–Minimum Data Set 2.0 (RAI-MDS 2.0).[22,23] For this report, survivors' scores were based on the full assessment following their acute stroke hospitalization. Quarterly assessments completed 90 days after the full assessment were also reported when available.

A stroke survivor's medical comorbidities were determined by using an encrypted health card number to link the acute stroke event in the CIHI-DAD to hospitalization records two years prior to the acute stroke event where up to 25 diagnoses may be recorded on the discharge abstract. The ICD-10 diagnostic code was used to determine if any comorbid condition, as defined by the Charlson comorbidity index, was present.[24,25] A survivor's comorbidity score was calculated using weightings according to Charlson.[25]

The prevalence of depression, dementia and Alzheimer's disease was determined from the CCRS database only and not cross-referenced with other databases that may have also contained this information.

The level of communication was determined by using the RAI-MDS 2.0 variable C4, which captures a stroke survivor's ability to express information by any means. Values range from 0 to 3 and 8, with 0 indicating no issues in being understood, 3 representing rarely or never understood, and 8 indicating comatose.

The ADL Hierarchy Scale rates patient level of dependence in four areas: personal hygiene, toileting, locomotion and eating.[23] Four items from the physical functioning and structural problems section of RAI-MDS 2.0 were used to calculate this indicator, and scores were categorized as follows: 0–2, independent/supervised/limited assistance; 3–4, extensive assistance; and 5–6, dependent/total dependence. The ADL Long Form rates patient level of dependence in seven areas: mobility in bed, transfers, locomotion, dressing, eating, toilet use and personal hygiene. The higher the score on a scale of 0–28, the more dependent the patient.[23] The mean and median ADL Long Form scores are reported.

The extent of cognitive impairment of stroke survivors was based on the Cognitive Performance Scale (CPS), which is a hierarchical scale based on five RAI-MDS 2.0 items: two cognitive items, one communication item, one ADL item and one comatose status item.[23] CPS scores were categorized as follows: 0, cognitively intact; 1–2, mild impairment; 3, moderate impairment; and 4–6, severe impairment. A comatose survivorwas assigned a score of 6.

The Aggressive Behaviour Scale summarizes four behavioural symptoms in the RAI-MDS 2.0: verbal abuse, physical abuse, socially inappropriate or disruptive behaviour, and resistance to care.[23] The scale ranges from 0 to 12 based on the frequency of the behaviours in the 7 days prior to the assessment. A higher score indicates a higher level of aggressive behaviour.[23] A score above 0 is a sign of aggressive behaviour and a score of 5 or more indicates severe aggressive behaviour.[22]

The Depression Rating Scale is intended to screen for depression and was calculated using seven items in the RAI-MDS 2.0 (mood and behavior patterns section).[23] Each behavioural item is rated based on frequency of observation. On a scale of 0–14, higher scores indicate higher levels of depressive symptoms.[23] A score of 3 or higher was used as a cut-off for potential depression; survivors with this score should be assessed or screened for depression.[22]

The Index of Social Engagement Measure assesses the degree of participation and initiative demonstrated in social interactions.[23] Six items in the psychosocial well-being section of the RAI-MDS 2.0 were used to calculate this indicator. On a scale from 0 to 6, higher scores indicate higher levels of participation and initiative.[23] Survivors with a score of 4 or higher were deemed to be socially engaged.

The Pain Scale score was calculated using two pain assessment items from the RAI-MDS 2.0.[23] One item measures pain frequency and the other, pain intensity. On a scale of 0–3, 0 indicates no pain; 1, less than daily pain; 2, daily pain but not severe; and 3, severe daily pain.

Falls were measured based on looking back 30 days from the full RAI-MDS 2.0 assessment undertaken at the time of admission to CCC or LTC following an acute stroke (variable J4a). A fall was documented regardless of whether it resulted in an injury.

Rehabilitation therapy was calculated using the following variables in the RAI-MDS 2.0:

- P1bb: the total number of minutes the resident received the following occupational therapy in the last 7 calendar days.
- P1bc: the total number of minutes the resident received the following physical therapy in the last 7 calendar days.
- P1ba: the total number of minutes the resident received the following speech-language therapy in the last 7 calendar days.
- P1bf: the total number of minutes the resident received the following recreation therapy in the last 7 calendar days

Nursing rehabilitation/restorative care was calculated for each of the following RAI-MDS 2.0 variables, using the number of days on which the techniques, procedures or activities were practiced for at least 15 minutes during each 24-hour period in the previous 7 days.

- P3a: Passive range of motion
- P3b: Active range of motion
- P3c: Splint or brace assistance
- P3d: Nursing assistance with bed mobility
- P3e: Nursing assistance with transfers
- P3f: Nursing assistance with walking
- P3g: Dressing or grooming
- P3h: Eating or swallowing
- P3i: Amputation/prosthesis care
- P3j: Nursing assistance communication
- P3k: Other rehabilitation/restorative care

Medication use

Medication use (analgesic, antianxiety, antidepressant, antipsychotic, hypnotic and diuretic) was calculated as the proportion of stroke survivors taking the medication at least once in the 7 days prior to their full RAI-MDS 2.0 assessment. Use of anticoagulant therapy was calculated by linking to the Ontario Drug Benefit Plan database, which includes data on prescriptions filled for Ontario residents aged 65 and older. We included stroke survivors in CCC who had a filled prescription within 90 days of their CCC discharge date and stroke survivors in LTC who had a filled prescription within 90 days of their acute stay discharge date.

Survivor outcomes

Several survivor outcomes were measured, including discharge destination, readmissions, mortality and health-related quality of life. HRQL was calculated as described by Mondor et al.[26] Briefly, the Minimum Data Set Health Status Index (MDS-HSI) is a validated measure of HRQL derived from mapping selected items from the full RAI-MDS 2.0 assessment to six attributes: vision, hearing and speech, mobility, self-care, cognition, emotion and pain.[26] An overall HRQL score is calculated by assigning a specific weight to each attribute score and summing the scores. The MDS-HSI score is a continuous scale ranging from -0.02 to 1.00, where 0 represents death and 1 represents the best possible health status. A negative value is a state worse than death.[26]

Statistical Analyses

Results are presented at the provincial level due to the small proportion of stroke survivors in the CCC and LTC sectors. In accordance with the requirements of Ontario's *Personal Health Information Privacy Act*, cell counts of 5 or less were suppressed, as were calculations based on cell counts of 5 or less.

Influenced by the establishment of Echo: Improving Women's Health in Ontario in 2010 and the publication of research on sex differences in patient health care in the province, we also present findings for indicators where there were statistically significant differences between men and women in 2014/15.[27] Also, in recognition of recent research findings of rural and urban differences in access to stroke best practices in Ontario, we present findings for indicators where there were statistically significant differences between rural and urban stroke survivors in 2014/15.[28]

Tests for trends over time were performed using quantile regression for the median of continuous variables and Cochran-Armitage trend test for binary variables. One-way ANOVA and Kruskal-Wallis tests were used to compare the mean and median of continuous variables, respectively. To compare the categorical variables, the chi-square test and Fisher's exact test were applied where appropriate. SAS version 9.4 software was used for all data analyses. Statistical significance was assessed where the p values for these tests were less than or equal to 0.01.

List of Exhibits

Demographics and Health Status of Stroke Survivors

Assistance with Activities of Daily Living

Access and Patient Flow

Rehabilitation

EXHIBIT 4.1B Proportion of stroke survivors who received recreation therapy or nursing restorative care in complex continuing care and long-term care, in Ontario, 2010/11 to 2014/15

EXHIBIT 4.1C Total mean and median number of minutes in rehabilitation therapy over 7 days for stroke survivors in complex continuing care and long-term care, by type of therapy, in Ontario, 2010/11 to 2014/15

EXHIBIT 4.2 Proportion of stroke survivors in complex continuing care and long-term care who received 0, 1, 2 or 3 core therapies, in Ontario, 2010/11 to 2014/15

Stroke Best Practice Care

Depression

EXHIBIT 5.1 Proportion of stroke survivors in complex continuing care and long-term care who were diagnosed with depression or were at risk for depression, in Ontario, 2010/11 to 2014/15

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EXHIBIT 6.1 Proportion of stroke survivors in complex continuing care and long-term care with impaired cognition, by Cognitive Performance Scale score, in Ontario, 2010/11 to 2014/15

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EXHIBIT 7.1 Proportion of stroke survivors in complex continuing care and long-term care who were socially engaged with a cognitive performance score of 0 to 3 at their full and 90-day quarterly RAI-MDS 2.0 assessments, in Ontario, 2010/11 to 2014/15

Pain

EXHIBIT 8.1A Proportion of stroke survivors in complex continuing care who experienced pain, by Pain Scale score, and overall analgesic use, in Ontario, 2010/11 to 2014/15

EXHIBIT 8.1B Proportion of stroke survivors in long-term care who experienced pain, by Pain Scale score, and overall analgesic use, in Ontario, 2010/11 to 2014/15

EXHIBIT 8.2A Proportion of stroke survivors in complex continuing care who took analgesics, by Pain Scale score, in Ontario, 2010/11 to 2014/15

EXHIBIT 8.2B Proportion of stroke survivors in long-term care who took analgesics, by Pain Scale score, in Ontario, 2010/11 to 2014/15

EXHIBIT 8.3A Proportion of stroke survivors in complex continuing care with full and 90-day quarterly RAI-MDS 2.0 assessments who experienced daily pain in the 7 days prior to assessment, in Ontario, 2010/11 to 2014/15

EXHIBIT 8.3B Proportion of stroke survivors in long-term care with full and 90-day quarterly RAI-MDS 2.0 assessments who experienced daily pain in the 7 days prior to assessment, in Ontario, 2010/11 to 2014/15

Medication Use

EXHIBIT 9.1 Proportion of stroke survivors aged 65 and older with atrial fibrillation in complex continuing care and long-term care who filled a prescription for anticoagulant therapy within 90 days of discharge, in Ontario, 2010/11 to 2014/15

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EXHIBIT 9.3A Proportion of stroke survivors with and without dementia in complex continuing care and long-term care who received antipsychotic medication, in Ontario, 2010/11 to 2014/15

EXHIBIT 9.3B Proportion of stroke survivors without dementia in complex continuing care with full and 90-day RAI-MDS 2.0 quarterly assessments who received antipsychotic medication in the 7 days prior to the assessments, in Ontario, 2010/11 to 2014/15

EXHIBIT 9.3C Proportion of stroke survivors without dementia in long-term care with full and 90-day RAI-MDS 2.0 quarterly assessments who received antipsychotic medication in the 7 days prior to assessment, in Ontario, 2010/11 to 2014/15

Falls

EXHIBIT 10.1A Proportion of stroke survivors in complex continuing care and long-term care who had a fall in the 30 days prior to a full RAI-MDS 2.0 assessment, in Ontario, 2010/11 to 2014/15

EXHIBIT 10.1B Proportion of stroke survivors in complex continuing care with full and 90-day quarterly RAI-MDS 2.0 assessments who had a fall in the 30 days prior to assessment, in Ontario, 2010/11 to 2014/15

EXHIBIT 10.1C Proportion of stroke survivors in long-term care with full and 90-day quarterly RAI-MDS 2.0 assessments who had a fall in the 30 days prior to assessment, in Ontario, 2010/11 to 2014/15

EXHIBIT 10.2A Proportion of stroke survivors in complex continuing care who had a fall in the 30 days prior to a full RAI-MDS 2.0 assessment, by RUG-III group, in Ontario, 2010/11 to 2014/15

EXHIBIT 10.2B Proportion of stroke survivors in long-term care who had a fall in the 30 days prior to a full RAI-MDS 2.0 assessment, by RUG-III group, in Ontario, 2010/11 to 2014/15

Gender and Location

EXHIBIT 11.1 Statistically significant differences in stroke care best practice between female and male stroke survivors in long-term care, in Ontario, 2014/15

EXHIBIT 11.2 Statistically significant differences in stroke care best practice between urban and rural stroke survivors in complex continuing care and long-term care, in Ontario, 2014/15

Survivor Outcomes

Appendix A

Demographics and Health Status of Stroke Survivors

EXHIBIT 1.1A Characteristics of stroke survivors admitted to complex continuing care, in Ontario, 2010/11 to 2014/15

	Year				
Characteristics, n (%)	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**
All stroke survivors, N	1,302	1,273	1,202	1,139	1,085
Female	708 (54.4)	662 (52.0)	638 (53.1)	598 (52.5)	552 (50.9)
Age, mean (median)	75.3 (78.0)	75.8 (78.0)	75.6 (79.0)	75.6 (78.0)	75.8 (78.0)
Rural[1]	159 (12.2)	128 (10.1)	117 (9.7)	103 (9.0)	120 (11.1)
Living alone	303 (23.3)	291 (22.9)	296 (24.6)	310 (27.2)	264 (24.3)
Married	621 (47.9)	566 (44.7)	549 (45.9)	517 (45.4)	530 (49.1)
Stroke type					
Ischemic stroke	1,022 (78.5)	1,009 (79.3)	918 (76.4)	884 (77.6)	831 (76.6)
Intracerebral hemorrhage	184 (14.1)	170 (13.4)	186 (15.5)	163 (14.3)	172 (15.9)
Transient ischemic attack	49 (3.8)	57 (4.5)	45 (3.7)	52 (4.6)	45 (4.1)
Subarachnoid hemorrhage	47 (3.6)	37 (2.9)	53 (4.4)	40 (3.5)	37 (3.4)
Income quintile[2]					
1 (lowest)	283 (21.9)	298 (23.6)	281 (23.5)	263 (23.1)	238 (22.1)
2	293 (22.6)	289 (22.8)	276 (23.0)	243 (21.4)	210 (19.5)
3	261 (20.2)	243 (19.2)	225 (18.8)	218 (19.2)	230 (21.4)
4	252 (19.5)	223 (17.6)	204 (17.0)	220 (19.3)	213 (19.8)
5 (highest)	206 (15.9)	212 (16.8)	212 (17.7)	194 (17.0)	186 (17.3)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Stroke survivors who resided in communities with a population of 10,000 or less.

[2] Stroke survivors were categorized into 5 groups (quintiles) based on their postal code and census data such as household income. The lowest-income group refers to survivors living in the least affluent neighbourhoods.

EXHIBIT 1.1B Characteristics of stroke survivors admitted to long-term care, in Ontario, 2010/11 to 2014/15

Characteristics, n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All stroke survivors, N	1,408	1,325	1,359	1,273	1,411
Female	908 (64.5)	835 (63.0)	858 (63.1)	794 (62.4)	892 (63.2)
Age, mean (median)	81.0 (83.0)	81.6 (83.0)	81.2 (84.0)	81.3 (83.0)	81.4 (84.0)
Rural[1]	178 (12.7)	167 (12.6)	163 (12.0)	167 (13.1)	192 (13.6)
Living alone	301 (21.4)	252 (19.0)	269 (19.8)	257 (20.2)	246 (17.4)
Married	421 (32.1)	382 (31.2)	357 (28.7)	348 (29.7)	401 (30.9)
Had stroke in long-term care	396 (28.1)	385 (29.1)	428 (31.5)	382 (30.0)	424 (30.0)
Stroke type					
Ischemic stroke	1,078 (76.6)	1,030 (77.7)	1,042 (76.7)	1,007 (79.1)	1,123 (79.6)
Intracerebral hemorrhage	146 (10.4)	147 (11.1)	140 (10.3)	117 (9.2)	146 (10.3)
Transient ischemic attack	159 (11.3)	125 (9.4)	156 (11.5)	137 (10.8)	124 (8.8)
Subarachnoid hemorrhage	25 (1.8)	23 (1.7)	21 (1.5)	12 (0.9)	18 (1.3)
Income quintile[2]					
1 (lowest)	345 (24.6)	337 (25.7)	346 (25.7)	324 (25.5)	364 (26.0)
2	296 (21.1)	270 (20.6)	271 (20.2)	279 (22.0)	289 (20.7)
3	270 (19.2)	255 (19.4)	266 (19.8)	246 (19.4)	264 (18.9)
4	258 (18.4)	229 (17.5)	229 (17.0)	197 (15.5)	243 (17.4)
5 (highest)	234 (16.7)	221 (16.8)	232 (17.3)	225 (17.7)	239 (17.1)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Rural survivors were defined as those residing in communities with a population of 10,000 or less.

[2] Stroke survivors were categorized into 5 groups (quintiles) based on their postal code and census data, such as household income. The lowest-income group refers to survivors living in the least affluent neighbourhoods.

EXHIBIT 1.2 Stroke survivors admitted to complex continuing care and long-term care, by age group, in Ontario, 2010/11 to 2014/15

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS–LTC, 2010/11 to 2015/16.
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

EXHIBIT 1.3A Clinical health status of stroke survivors admitted to complex continuing care, in Ontario, 2010/11 to 2014/15

Health Status, n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All stroke survivors, N	1,302	1,273	1,202	1,139	1,085
Atrial fibrillation	464 (35.6)	482 (37.9)	481 (40.0)	428 (37.6)	411 (37.9)
Depression	244 (18.7)	250 (19.6)	214 (17.8)	208 (18.3)	184 (17.0)
Dementia	163 (12.5)	163 (12.8)	162 (13.5)	177 (15.5)	179 (16.5)
Alzheimer's disease	39 (3.0)	26 (2.1)	40 (3.3)	24 (2.1)	31 (2.9)
Charlson score ≥2	775 (59.5)	739 (58.1)	736 (61.2)	718 (63.0)	650 (59.9)
Palliative[1]	127 (9.8)	140 (11.0)	128 (10.6)	132 (11.6)	156 (14.4)
Feeding tube	159 (12.2)	182 (14.3)	142 (11.8)	159 (14.0)	125 (11.5)
ADL Functioning[2]					
Independent/supervised/ limited assistance (0–2)	315 (24.2)	277 (21.8)	310 (25.8)	228 (20.0)	224 (20.6)
Extensive assistance (3–4)	379 (29.1)	391 (30.7)	337 (28.0)	342 (30.0)	328 (30.2)
Dependent/total dependence (5–6)	608 (46.7)	605 (47.5)	555 (46.2)	569 (50.0)	533 (49.1)
Long,[3] mean (median)	17.8 (19.0)	18.4 (20.0)	18.1 (19.0)	18.7 (20.0)	18.7 (20.0)

Health Status, n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
Communication					
Understood	652 (50.1)	576 (45.3)	537 (44.7)	453 (39.8)	446 (41.1)
Usually understood[4]	322 (24.7)	349 (27.4)	340 (28.3)	315 (27.7)	328 (30.2)
Sometimes understood[5]	212 (16.3)	235 (18.5)	241 (20.1)	282 (24.8)	235 (21.7)
Rarely/never understood and comatose[6]	116 (8.9)	113 (8.9)	84 (7.0)	89 (7.8)	76 (7.0)
Aggressive Behaviour Scale[7]					
Nonaggressive (0)	1,030 (79.1)	1,018 (80.0)	969 (80.6)	874 (76.7)	823 (75.9)
Aggressive (1–4)	216 (16.6)	213 (16.7)	182 (15.1)	213 (18.7)	218 (20.1)
Severely aggressive (5–12)	38 (2.9)	34 (2.7)	42 (3.5)	47 (4.1)	42 (3.9)
Incontinence					
Bowel control[8]					
Continent	622 (47.8)	589 (46.3)	588 (48.9)	517 (45.4)	490 (45.2)
Occasionally incontinent	131 (10.1)	103 (8.1)	90 (7.5)	109 (9.6)	100 (9.2)
Incontinent	549 (42.2)	581 (45.6)	524 (43.6)	513 (45.0)	495 (45.6)
Bladder control[9]					
Continent	600 (46.1)	596 (46.8)	565 (47.0)	509 (44.7)	490 (45.2)
Occasionally incontinent	121 (9.3)	118 (9.3)	104 (8.7)	109 (9.6)	101 (9.3)
Incontinent	581 (44.6)	559 (43.9)	533 (44.3)	521 (45.7)	494 (45.5)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Survivor was experiencing end-stage disease with 6 months or less to live, received hospice care in the 14 days prior to the full RAI-MDS 2.0 assessment or had a CHESS Scale score of 4 or 5 at any time after admission to complex continuing care.

[2] The Activities of Daily Living (ADL) Self-Performance Hierarchy Scale ranges from 0 to 6 with higher scores indicating greater impairment.

[3] The Activities of Daily Living (ADL) Long Form ranges from 0 to 28 with higher scores indicating greater impairment.

[4] Survivor has difficulty finding words or finishing thoughts.

[5] Survivor's ability is limited to making concrete requests regarding basic needs such as food and drink.

[6] There were 20 or fewer comatose patients each year.

[7] The Aggressive Behaviour Scale ranges from 0 to 12 with higher scores indicating higher levels of aggressive behaviour.

[8] Continent includes complete control and usually continent (incontinent less than weekly); occasionally incontinent, includes incontinent once a week; and incontinent, includes frequently incontinent (incontinent 2 to 3 times a week) and incontinent all of the time.

[9] Continent includes complete control and usually continent (incontinent episodes once a week or less); occasionally incontinent includes incontinent 2 or more times a week; and incontinent includes frequently incontinent (incontinent daily with some control present) and inadequate control with multiple daily episodes.

EXHIBIT 1.3B Clinical health status of stroke survivors admitted to long-term care, in Ontario, 2010/11 to 2014/15

Health Status, n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All stroke survivors, N	1,408	1,325	1,359	1,273	1,411
Atrial fibrillation	580 (41.2)	583 (44.0)	629 (46.3)	566 (44.5)	674 (47.8)
Depression	326 (23.2)	320 (24.2)	320 (23.5)	267 (21.0)	329 (23.3)
Dementia	501 (35.6)	452 (34.1)	504 (37.1)	467 (36.7)	534 (37.8)
Alzheimer's disease	95 (7.3)	97 (7.9)	90 (7.2)	82 (7.0)	66 (5.1)
Charlson score ≥2	789 (56.0)	771 (58.2)	826 (60.8)	773 (60.7)	844 (59.8)
Palliative[1]	70 (5.0)	70 (5.3)	59 (4.3)	67 (5.3)	66 (4.7)
Feeding tube	112 (8.0)	82 (6.2)	101 (7.4)	90 (7.1)	83 (5.9)
ADL Functioning[2]					
Independent/supervised/ limited assistance (0–2)	251 (17.8)	234 (17.7)	217 (16.0)	179 (14.1)	193 (13.7)
Extensive assistance (3–4)	504 (35.8)	508 (38.3)	592 (43.6)	576 (45.2)	635 (45.0)
Dependent/total dependence (5–6)	653 (46.4)	583 (44.0)	550 (40.5)	518 (40.7)	583 (41.3)
Long,[3] mean (median)	18.3 (19.5)	18.2 (19.0)	18.4 (19.0)	18.6 (20.0)	18.5 (19.0)

Health Status, n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
Communication					
Understood	622 (44.2)	594 (44.8)	598 (44.0)	547 (43.0)	625 (44.3)
Usually understood[4]	447 (31.8)	428 (32.3)	444 (32.7)	410 (32.2)	495 (35.1)
Sometimes understood[5]	231 (16.4)	226 (17.1)	234 (17.2)	238 (18.7)	218 (15.5)
Rarely/never understood and comatose[6]	108 (7.7)	77 (5.8)	83 (6.1)	78 (6.1)	73 (5.2)
Aggressive Behaviour Scale[7]					
Nonaggressive (0)	948 (67.3)	896 (67.6)	887 (65.3)	831 (65.3)	920 (65.2)
Aggressive (1–4)	377 (26.8)	340 (25.7)	406 (29.9)	374 (29.4)	421 (29.8)
Severely aggressive (5–12)	83 (5.9)	89 (6.7)	65 (4.8)	68 (5.3)	69 (4.9)
Incontinence					
Bowel control[8]					
Continent	655 (46.5)	634 (47.8)	609 (44.8)	578 (45.4)	667 (47.3)
Occasionally incontinent	113 (8.0)	110 (8.3)	111 (8.2)	101 (7.9)	103 (7.3)
Incontinent	640 (45.5)	581 (43.8)	639 (47.0)	594 (46.7)	641 (45.4)
Bladder control[9]					
Continent	438 (31.1)	410 (30.9)	387 (28.5)	387 (30.4)	383 (27.1)
Occasionally incontinent	124 (8.8)	133 (10.0)	129 (9.5)	120 (9.4)	163 (11.6)
Incontinent	846 (60.1)	782 (59.0)	843 (62.0)	766 (60.2)	865 (61.3)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Survivor was experiencing end-stage disease with 6 months or less to live, received hospice care in the 14 days prior to the full RAI-MDS 2.0 assessment or had a CHESS scale score of 4 or 5 at any time after admission to long-term care.

[2] The Activities of Daily Living (ADL) Self-Performance Hierarchy Scale ranges from 0 to 6 with higher scores indicating greater impairment.

[3] The Activities of Daily Living (ADL) Long Form includes scores ranging from 0 to 28 with higher scores indicating greater impairment.

[4] Survivor has difficulty finding words or finishing thoughts.

[5] Survivor's ability is limited to making concrete requests regarding basic needs such as food and drink.

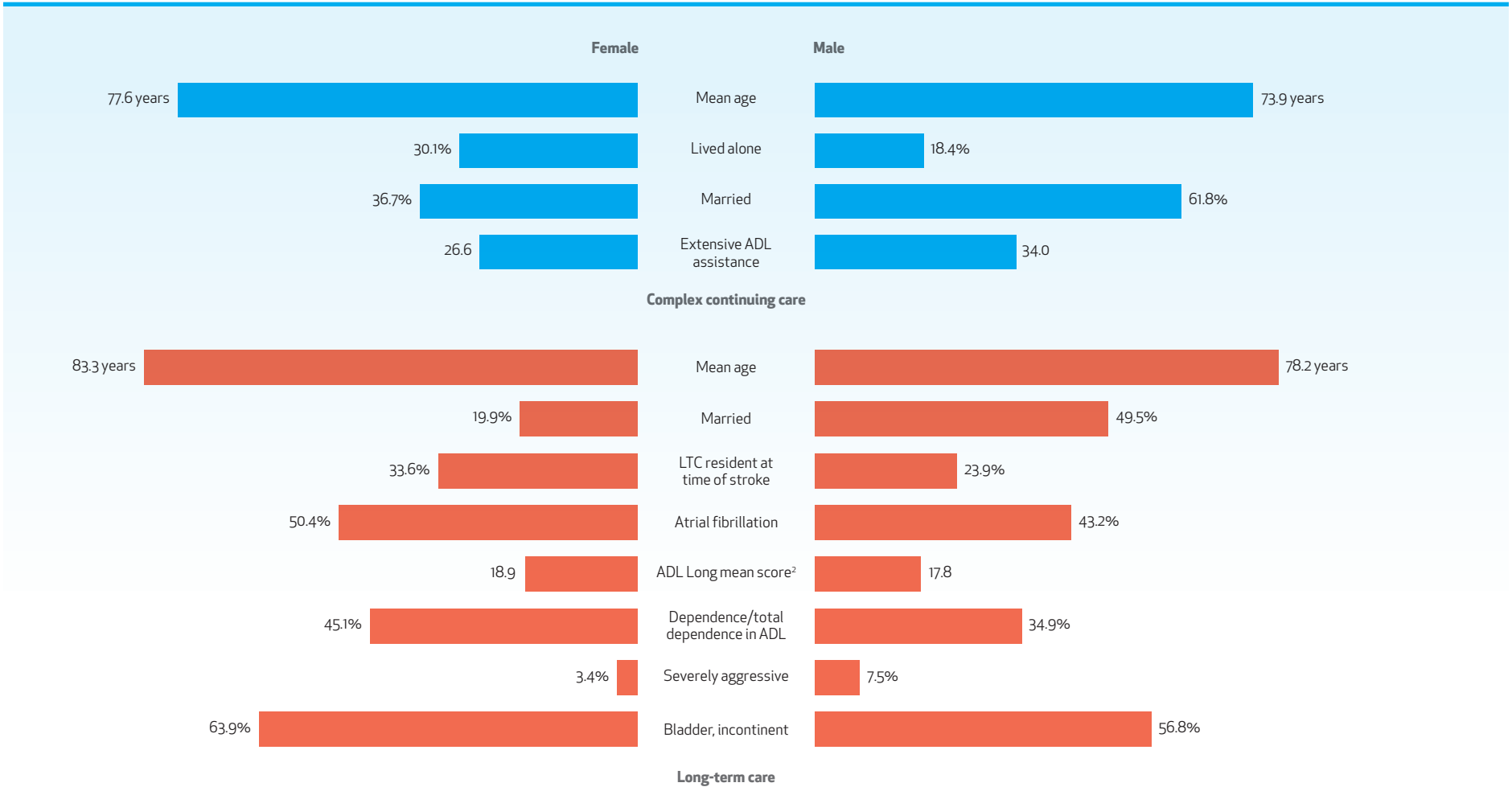
[6] There were 5 or fewer comatose patients each year.

[7] The Aggressive Behaviour Scale ranges from 0 to 12 with higher scores indicating higher levels of aggressive behaviour.

[8] Continent includes complete bowel control and usually continent (incontinent less than weekly). Occasionally incontinent includes incontinent once a week. Incontinent includes frequently incontinent (incontinent 2 to 3 times a week) and incontinent all the time.

[9] Continent, includes complete bladder control and usually continent (incontinent episodes once a week or less) Occasionally incontinent includes incontinent 2 or more times a week. Incontinent includes frequently incontinent (incontinent daily with some control present) and inadequate control with multiple daily episodes.

EXHIBIT 1.4A Statistically significant differences[1] in clinical health status between female and male stroke survivors admitted to complex continuing care and long-term care, in Ontario, 2014/15



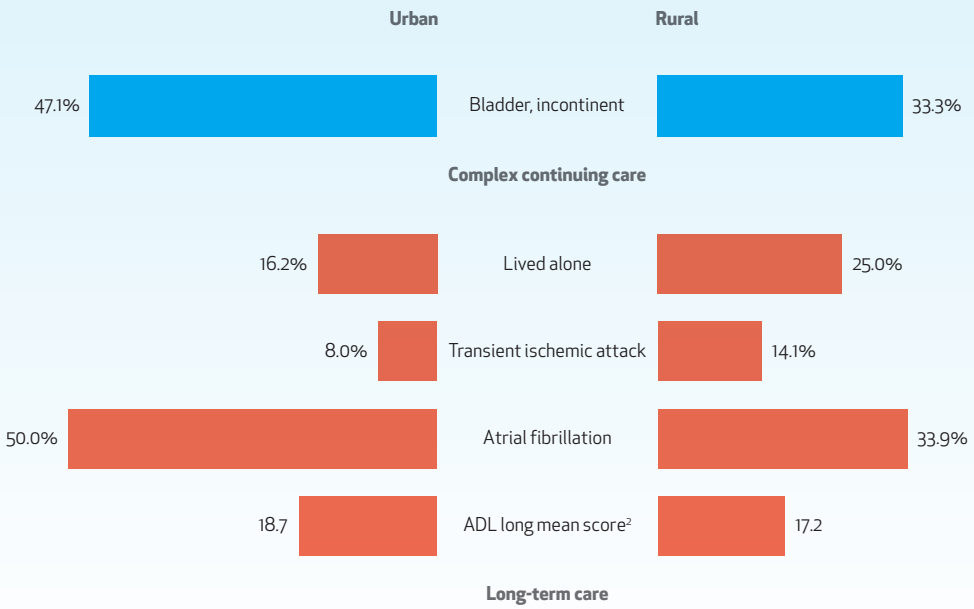
Data sources: CIHI–DAD, 2014/15; CCRS-CCC and CCRS–LTC, 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Significance was determined if the p-value associated with the comparison was < 0.01.

[2] The Activities of Daily Living (ADL) Long Form scale ranges from 0 to 28 with higher scores indicating a greater need for assistance.

EXHIBIT 1.4B Statistically significant differences[1] in clinical health status between urban and rural stroke survivors admitted to complex continuing care and long-term care, in Ontario, 2014/15



Data sources: CIHI–DAD, 2014/15; CCRS-CCC and CCRS–LTC, 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS-CCC or CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Significance was determined if the p-value associated with the comparison was < 0.01.

[2] The Activities of Daily Living (ADL) Long Form ranges from 0 to 28 with higher scores indicating a greater need for assistance.

EXHIBIT 1.5A Number and percentage of stroke survivors admitted to complex continuing care, by RUG-III group,[1] in Ontario, 2010/11 to 2014/15

RUG-III Group,[1] n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All stroke survivors, N	1,302	1,273	1,202	1,139	1,085
Special rehabilitation	956 (73.4)	950 (74.6)	910 (75.7)	847 (74.4)	818 (75.4)
Rehabilitation, ultra high	34 (3.6)	28 (2.9)	42 (4.6)	47 (5.5)	71 (8.7)
Rehabilitation, very high	42 (4.4)	26 (2.7)	33 (3.6)	38 (4.5)	43 (5.3)
Rehabilitation, high	67 (7.0)	80 (8.4)	74 (8.1)	101 (11.9)	80 (9.8)
Rehabilitation, medium	645 (67.5)	670 (70.5)	658 (72.3)	580 (68.5)	556 (68.0)
Rehabilitation, low	168 (17.6)	146 (15.4)	103 (11.3)	81 (9.6)	68 (8.3)
Clinically complex care	153 (11.8)	154 (12.1)	141 (11.7)	134 (11.8)	114 (10.5)
Extensive services	121 (9.3)	101 (7.9)	102 (8.5)	95 (8.3)	91 (8.4)
Special care	37 (2.8)	39 (3.1)	22 (1.8)	39 (3.4)	33 (3.0)
Other[2]	35 (2.7)	29 (2.3)	27 (2.2)	24 (2.1)	29 (2.7)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] In the RUG-III 44-group methodology, there are 7 categories; ranked in order from highest to lowest resource intensity, these include special rehabilitation, extensive services, special care, clinically complex care, impaired cognition, behaviour problems and reduced physical function.

[2] Other categories include reduced physical function, impaired cognition and behaviour problems.

EXHIBIT 1.5B Number and percentage of of stroke survivors admitted to long-term care, by RUG-III group,[1] in Ontario, 2010/11 to 2014/15

	Year				
RUG-III Group,[1] n (%)	2010/11	2011/12	2012/13	2013/14	2014/15
All stroke survivors, N	1,408	1,325	1,359	1,273	1,411
Special rehabilitation	194 (13.8)	148 (11.2)	144 (10.6)	77 (6.0)	128 (9.1)
Rehabilitation, medium and high	36 (18.6)	39 (26.4)	30 (20.8)	46 (59.7)	78 (60.9)
Rehabilitation, low	158 (81.4)	109 (73.6)	114 (79.2)	31 (40.3)	50 (39.1)
Clinically complex care	495 (35.2)	511 (38.6)	511 (37.6)	581 (45.6)	603 (42.7)
Reduced physical function	425 (30.2)	387 (29.2)	407 (29.9)	361 (28.4)	391 (27.7)
Extensive services	70 (5.0)	95 (7.2)	78 (5.7)	65 (5.1)	86 (6.1)
Special care	124 (8.8)	107 (8.1)	130 (9.6)	115 (9.0)	133 (9.4)
Behaviour problems and Impaired cognition	100 (7.1)	77 (5.8)	89 (6.5)	74 (5.8)	70 (5.0)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] In the RUG-III 34-group methodology, there are 7 categories; ranked in order from highest to lowest resource intensity, these include extensive services, special rehabilitation, special care, clinically complex care, impaired cognition, behaviour problems and reduced physical function.

Assistance with activities of daily living

EXHIBIT 2.1A Proportion of stroke survivors in complex continuing care requiring assistance with activities of daily living,[1] by RUG-III group, in Ontario, 2010/11 to 2014/15

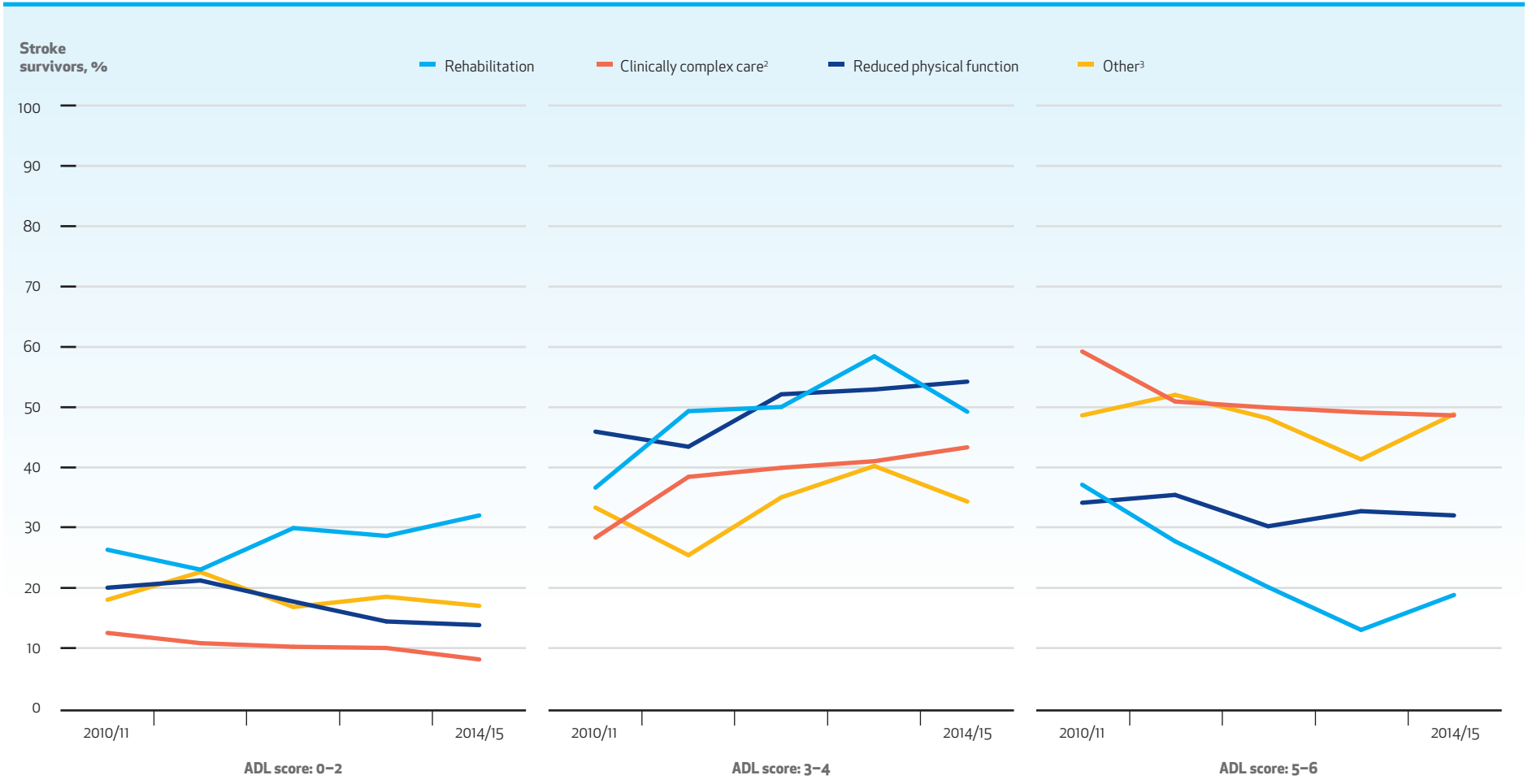
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The Activities of Daily Living (ADL) Self-Performance Hierarchy Scale ranges from 0 to 6, with a higher score indicating a greater need for assistance. Scores are categorized into 3 levels: independent/supervised/limited assistance (0 to 2), extensive assistance (3 to 4) and dependent/total dependence (5 to 6).

[2] The RUG-III category with the largest number of stroke survivors

EXHIBIT 2.1B Proportion of stroke survivors in long-term care requiring assistance with activities of daily living,[1] by RUG-III group, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The Activities of Daily Living (ADL) Self-Performance Hierarchy Scale ranges from 0 to 6, with a higher score indicating a greater need for assistance. Scores for activities of daily living are categorized into 3 levels: independent/supervised/limited assistance (0 to 2), extensive assistance (3 to 4) and dependent/total dependence (5 to 6).

[2] The RUG-III category with the largest number of stroke survivors.

[3] Other includes RUG-III categories extensive services, special care, behaviour problems and impaired cognition.

FINDINGS – DEMOGRAPHICS AND HEALTH STATUS OF STROKE SURVIVORS

Exhibits 1.1a,b and 1.2

In 2014/15, stroke survivors in complex continuing care were approximately 6 years younger than those in long-term care, with a median age of 78 and 84 years, respectively. In complex continuing care, the largest proportion of stroke survivors were aged 76 to 85; in long-term care, those aged 86 and older were the largest proportion. The proportion of stroke survivors in complex continuing care who were aged 66 to 75 and 76 to 85 declined, respectively, from 22.2% and 36.4% in 2010/11 to 20.8% and 34.8% in 2014/15. In the long-term care cohort, the proportion of stroke survivors who were 76 to 85 years of age decreased from 42.1% in 2010/11 to 35.9% in 2014/15, and those aged 86 and older increased from 36.1% in 2010/11 to 40.8% in 2014/15.

Just over half of stroke survivors in complex continuing care were female compared to almost two-thirds of those in long-term care.

In 2014/15, 26.0% of stroke survivors in long-term care were in the lowest income quintile compared to 22.1% of those in complex continuing care.

A higher proportion of stroke survivors were living alone (24.3%) at the time of admission to complex continuing care compared to those in long-term care (17.4%). Stroke survivors in complex continuing care were more likely to be married than those in long-term care (49.1% vs. 30.9%).

Of stroke survivors in long-term care, 30% had been existing long-term care residents prior to their acute stroke or TIA event. There was a similar distribution of stroke types within both sectors; however, long-term care had a higher proportion of survivors considered to have experienced a TIA compared to complex continuing care (8.8% vs. 4.1%).

Exhibits 1.3a,b

In 2014/15, almost 60% of stroke survivors in complex continuing care and long-term care had a Charlson score of 2 or higher, suggesting a reasonable burden of comorbidity. About 40% of stroke survivors in complex continuing care and almost 50% in long-term care had atrial fibrillation—a condition associated with increased risk for stroke.

Among stroke survivors, 49.1% in complex continuing care and 41.3% in long-term care were categorized as dependent to totally dependent in the performance of activities of daily living in 2014/15. Over half of stroke survivors in CCC and LTC (58.9% and 55.8%, respectively) were considered to have limitations in communicating. Just under half of stroke survivors in CCC and LTC were considered to be incontinent in bowel or bladder (45.6% and 45.5% in CCC and 45.4% and 61.3% in LTC, respectively). A much higher prevalence of stroke survivors in complex continuing care required tube feeding (11.5% vs. 5.9%) and were considered palliative (14.4% vs. 4.7%) compared to those in long-term care. The proportion of stroke survivors considered to be aggressive (i.e., had an aggressive behaviour score of 1 or higher) was almost 25% in complex continuing care and over 30% in long-term care.

Exhibits 1.4a,b

Compared to their male counterparts, female stroke survivors in complex continuing care were older (73.9 vs. 77.6 years) and more likely to live alone (18.4% vs. 30.1%). Female stroke survivors in long-term care were also older than their male counterparts (83.3 vs 78.2 years).

Exhibits 1.4c,d

Compared to their urban counterparts, rural stroke survivors in complex continuing care were less likely to have bladder incontinence (47.1% vs. 33.3%). Rural stroke survivors in long-term care were more likely to live alone (16.2% vs. 25.0%) and less likely to be diagnosed with atrial fibrillation (50.0% vs 33.9%).

Exhibits 1.5a,b

In 2014/15, three-quarters of stroke survivors in complex continuing care were included in the RUG-III special rehabilitation category, with the majority (68.0%) receiving therapy to qualify for a medium level of rehabilitation. The majority of stroke survivors in long-term care were categorized to either the clinically complex care or the reduced physical functioning category (42.7% and 27.7%, respectively).

Exhibits 2.1a,b

Over the study period, the majority of stroke survivors in complex continuing care were categorized into the RUG-III special rehabilitation category medium or low; among them, the proportion considered dependent or totally dependent in activities of daily living (ADL score of 5–6) increased from 42.7% in 2010/11 to 51.3% 2014/15. Among stroke survivors categorized as having ultra high, very high or high special rehabilitation needs, the proportion considered to require extensive assistance with activities of daily living (ADL score of 3–4) rose from 38.5% in 2010/11 to 45.4% in 2014/15.

Over the study period, the majority of stroke survivors in long-term care were categorized into the RUG-III clinically complex. The proportion of survivors considered to be dependent or totally dependent in activities of daily living (ADL score of 5–6) decreased from 59.2% in 2010/11 to 48.6% in 2014/15, and the proportion requiring extensive assistance with activities of daily living (ADL score of 3–4) increased from 28.3% in 2010/11 to 43.3% in 2014/15. The proportion of long-term care stroke survivors classified into the RUG-III special rehabilitation category and considered to require extensive assistance (ADL score of 3–4) increased from 36.6% in 2010/11 to 49.2% in 2014/15.

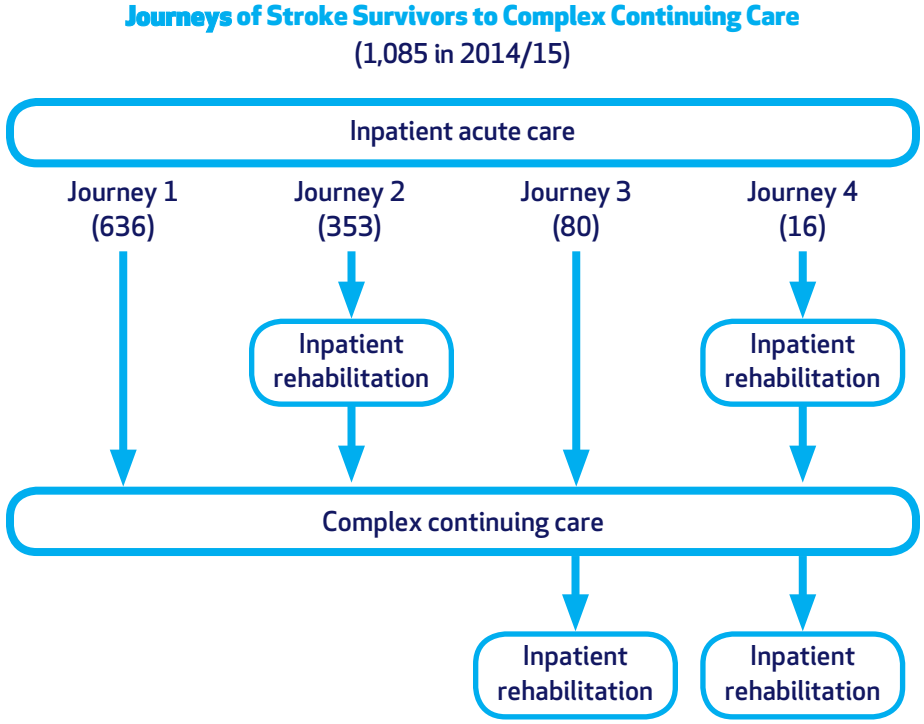
HIGHLIGHTS

- Stroke survivors in complex continuing care were approximately 6 years younger than those in long-term care; their respective median ages were 78 and 84 years.
- Women represented about half of stroke survivors in complex continuing care and about two-thirds of those in long-term care.
- In both the complex continuing care and long-term care settings, a substantial proportion of stroke survivors lived alone prior to admission (24.3% and 17.4%, respectively).
- Of stroke survivors admitted to long-term care following an acute stroke, 30% were long-term care residents at the time of the stroke.
- Almost 60% of stroke survivors in complex continuing care and long-term care had a diagnosed comorbidity.
- Over 50% of stroke survivors in complex continuing care and long-term care had limitations in their ability to communicate.
- Approximately 75% of stroke survivors in complex continuing care and 10% of stroke survivors in long-term care were categorized as RUG-III special rehabilitation.
- For the majority of stroke survivors in complex continuing care, the level of assistance required to perform activities of daily living increased over the study period.
- For the majority of stroke survivors in long-term care, the proportion classified as dependent or totally dependent in activities of daily living decreased over the study period.
- Almost half of all stroke survivors in complex continuing care and long-term care experienced bladder or bowel incontinence.

Access and Patient Flow

EXHIBIT 3.1A Journeys to complex continuing care by stroke survivors following an acute stroke or TIA, in Ontario, 2010/11 to 2014/15

Group	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All survivors, N	1,302	1,273	1,202	1,139	1,085
Journey 1: Inpatient acute care → Complex continuing care					
Survivors, n (%)	906 (69.6)	876 (68.8)	777 (64.6)	733 (64.4)	636 (58.6)
Total institutional length of stay in days, mean (median)[1]	137.5 (89)	136.0 (87)	136.2 (84)	129.5 (86)	107.7 (79.5)
Journey 2: Inpatient acute care → Inpatient rehabilitation → Complex continuing care					
Survivors, n (%)	275 (21.1)	260 (20.4)	300 (25.0)	298 (26.2)	353 (32.5)
Total institutional length of stay in days, mean (median)[1]	158.5 (116)	156.4 (125)	161.4 (130)	156.8 (113)	128.1 (108)
Journey 3: Inpatient acute care → Complex continuing care → Inpatient rehabilitation					
Survivors, n (%)	110 (8.4)	127 (10.0)	116 (9.7)	95 (8.3)	80 (7.4)
Total institutional length of stay in days, mean (median)[1]	124.0 (103)	116.6 (105)	116.5 (101.5)	109.2 (101)	111.4 (98)
Journey 4: Inpatient acute care → Inpatient rehabilitation → Complex continuing care → Inpatient rehabilitation					
Survivors, n (%)	11 (0.8)	10 (0.8)	9 (0.7)	13 (1.1)	16 (1.5)
Total institutional length of stay in days, mean (median)[1]	150.4 (122)	143.4 (128)	143.6 (136)	119.6 (107)	133.6 (125)



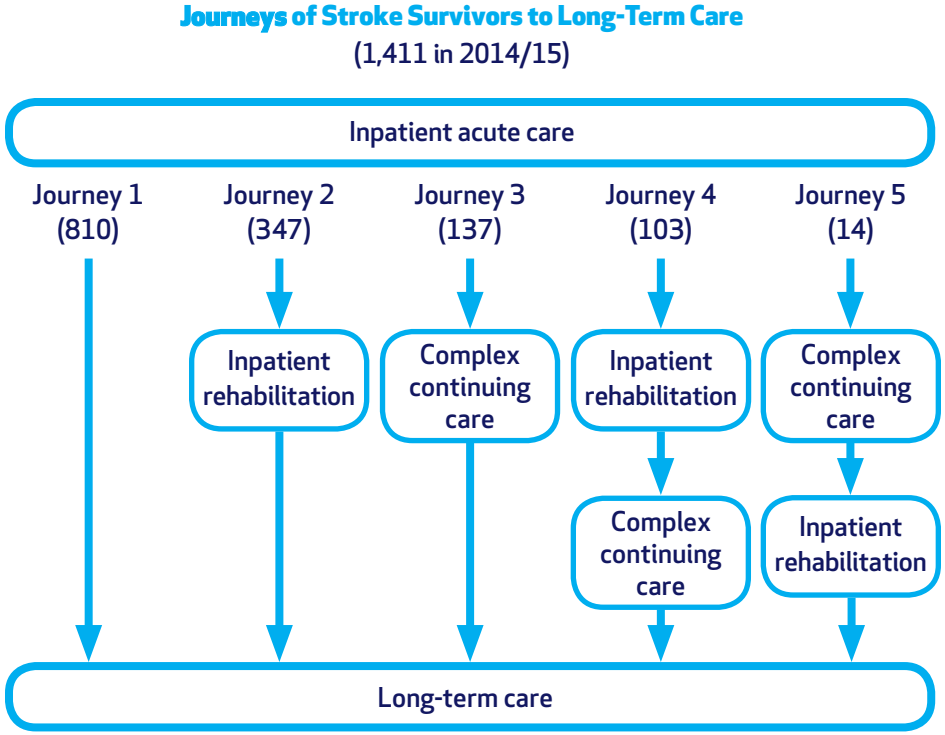
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1]Total institutional length of stay was calculated by counting the number of days spent in institutional settings: the CCC discharge date minus the CCC admission date/the DAD discharge date minus the DAD admission date.

EXHIBIT 3.1B Journeys to long-term care by stroke survivors following an acute stroke or TIA, in Ontario, 2010/11 to 2014/15

Group	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All survivors, N	1,408	1,325	1,359	1,273	1,411
Journey 1: Inpatient acute care → Long-term care					
Survivors, n (%)	864 (61.4)	780 (58.9)	845 (62.2)	745 (58.5)	810 (57.4)
Total institutional length of stay in days, mean (median)[1]	552.0 (316.5)	511.9 (278.5)	533.7 (318)	448.5 (264)	443.1 (312)
Journey 2: Inpatient acute care → Inpatient rehabilitation → Long-term care					
Survivors, n (%)	221 (15.7)	246 (18.6)	245 (18.0)	289 (22.7)	347 (24.6)
Total institutional length of stay in days, mean (median)[1]	638.1 (315)	661.7 (348)	548.1 (231)	462.6 (248)	438.1 (298)
Journey 3: Inpatient acute care → Complex continuing care → Long-term care					
Survivors, n (%)	226 (16.1)	213 (16.1)	174 (12.8)	146 (11.5)	137 (9.7)
Total institutional length of stay in days, mean (median)[1]	706.0 (357.5)	594.2 (316)	596.1 (364)	561.7 (349)	516.8 (423)
Journey 4: Inpatient acute care → Inpatient rehabilitation → Complex continuing care → Long-term care					
Survivors, n (%)	82 (5.8)	75 (5.7)	79 (5.8)	79 (6.2)	103 (7.3)
Total institutional length of stay in days, mean (median)[1]	665.6 (409)	815.1 (576)	528.0 (322)	527.9 (336)	446.2 (290)
Journey 5: Inpatient acute care → Complex continuing care → Inpatient rehabilitation → Long-term care					
Survivors, n (%)	15 (1.1)	11 (0.8)	16 (1.2)	14 (1.1)	14 (1.0)
Total institutional length of stay in days, mean (median)[1]	688.3 (443)	487.9 (264)	593.6 (346.5)	362.9 (195.5)	419.8 (219.5)

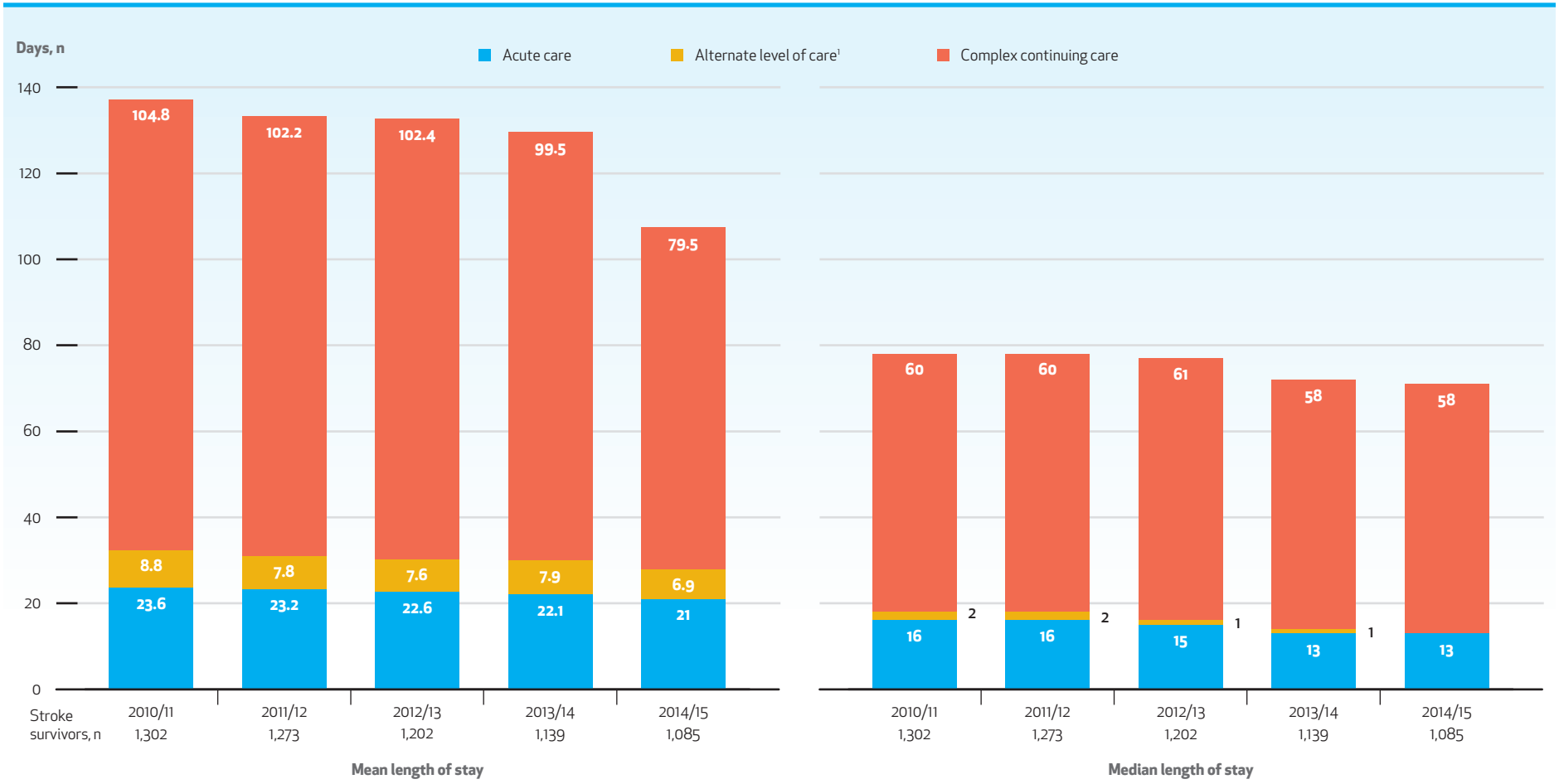


Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Total institutional length of stay in days after an acute stroke was calculated by counting the number of days spent in institutional settings: the long-term care discharge date/death date/date censored at March 31, 2017, minus the stroke or TIA acute care admission date. The calculation includes survivors residing in long-term care at the time of their stroke or TIA.

EXHIBIT 3.2 Mean and median length of stay from admission to acute care for stroke or TIA to discharge from complex continuing care, in Ontario, 2010/11 to 2014/15

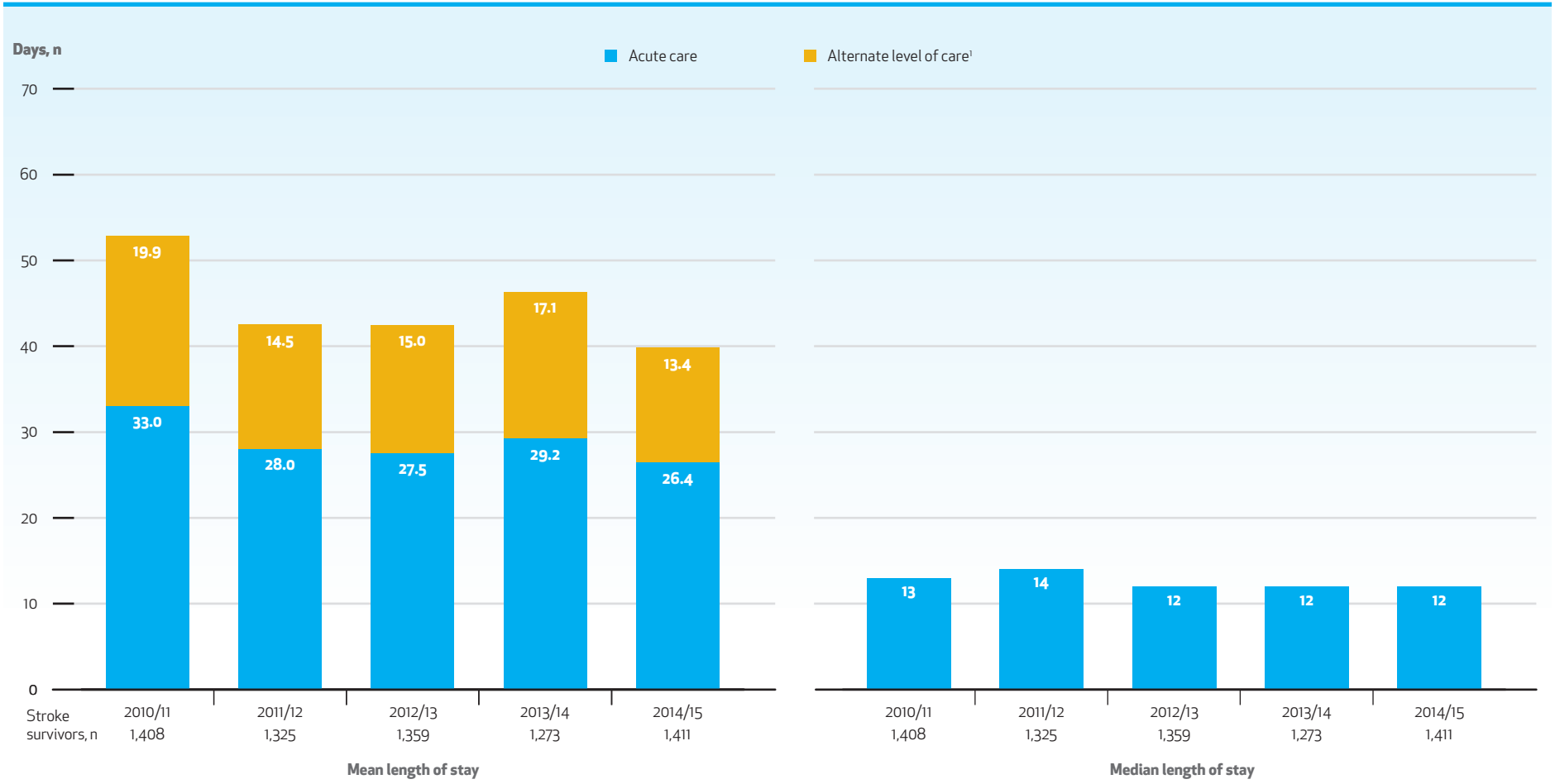


Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] A patient is designated alternate level of care (ALC) by a physician or his/her delegate when the patient is occupying a hospital bed in an acute care, complex continuing care, mental health or rehabilitation setting and does not require the intensity of resources or services provided. The ALC wait period begins at the time of designation and ends at the time of patient discharge or transfer to a discharge destination (or when the patient's condition changes and the ALC designation no longer applies). The standardized ALC definition was implemented across all acute care facilities in Ontario on July 1, 2009.

EXHIBIT 3.3 Mean and median length of stay for acute stroke or TIA among stroke survivors admitted to long-term care, by level of care, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] A patient is designated alternate level of care (ALC) by a physician or his/her delegate when the patient is occupying a hospital bed in an acute care, complex continuing care, mental health or rehabilitation setting and does not require the intensity of resources or services provided. The ALC wait period begins at the time of designation and ends at the time of patient discharge or transfer to a discharge destination (or when the patient's condition changes and the ALC designation no longer applies). The standardized ALC definition was implemented across all acute care facilities in Ontario on July 1, 2009.

FINDINGS – ACCESS AND PATIENT FLOW

Exhibits 3.1a,b

These exhibits show that the most common journey for stroke survivors admitted to complex continuing care or long-term care within 180 days of their acute stroke or TIA hospitalization is a direct transition from acute care. In 2010/11, 78.0% of stroke survivors admitted to complex continuing care within 180 days of their acute stroke or TIA event were discharged directly to complex continuing care (journeys 1 and 3); by 2014/15, this proportion had dropped to 66.0%. In 2010/11, 61.4% of stroke survivors went directly to long-term care following their acute stroke or TIA hospitalization (journey 1); only 57.4% of stroke survivors took this journey in 2014/15.

The second most prevalent transition involved admission to inpatient rehabilitation prior to admission to either complex continuing care or long-term care (journeys 2 and 4). Among the complex continuing care cohort, 21.9% of stroke survivors experienced this journey in 2010/11, increasing to 34.0% in 2014/15. Among the LTC cohort, 21.5% of stroke survivors experienced this journey in 2010/11, increasing to 31.9% in 2014/15.

Less than 10% of stroke survivors admitted to complex continuing care in the 180 days after their hospitalization for acute stroke or TIA transitioned from complex continuing care to inpatient rehabilitation (journey 3). The proportion of stroke survivors in long-term care who transitioned to inpatient rehabilitation or complex continuing care prior to admission to LTC increased from 38.7% in 2010/11 to 42.6% in 2014/15 (journeys 2, 3, 4 and 5).

Total institutional time for journeys in both cohorts decreased over the five-year study period. For the complex continuing care cohort in 2014/15, journey 1 (a direct transition into complex continuing care after the acute stroke or TIA hospitalization) had the shortest total median institutional time: 79.5 days. This was followed by journey 3 (admission to inpatient rehabilitation after complex continuing care) at 98.0 days; and journey 2 (admission to inpatient rehabilitation prior to complex continuing care) at 108.0 days. For the 2014/15 long-term care cohort, journey 5 (admission to complex continuing care and then inpatient rehabilitation) had the shortest total median institutional time: 219.5 days. This was followed by journey 4 (admission to inpatient rehabilitation and then complex continuing care) at 290 days; journey 2 (admission to inpatient rehabilitation prior to LTC) at 298 days; and journey 1, (admission directly to long-term care following the acute stroke or TIA) at 312 days. Journey 3 (admission to complex continuing care prior to LTC) had the longest total institutional time at 423 days.

Exhibits 3.2 and 3.3

The median length of stay in acute care for stroke survivors who were subsequently admitted to complex continuing care decreased from 16 days in 2010/11 to 13 days in 2014/15. For stroke survivors subsequently admitted to long-term care, the median length of stay in acute care decreased from 13 days in 2010/11 to 12 days in 2014/15. A similar pattern was observed in acute care for mean lengths of stay and alternate levels of care.

HIGHLIGHTS

- The most common journey among stroke survivors admitted to complex continuing care or long-term care within 180 days of their acute stroke event was direct from the acute care setting; in 2014/15, 66.0% of stroke survivors went directly to complex continuing care and 57.4% went directly to long-term care from the acute stroke care setting.

- The second most common journey among stroke survivors admitted to complex continuing care or long-term care within 180 days of the acute event was admission to inpatient rehabilitation just prior to admission to complex continuing care or long-term care. Between 2010/11 and 2014/15, the proportion of stroke survivors in complex continuing care who followed this journey increased from 21.9% to 34.0%; among their counterparts in long-term care, the proportion increased from 21.5% to 31.9%.

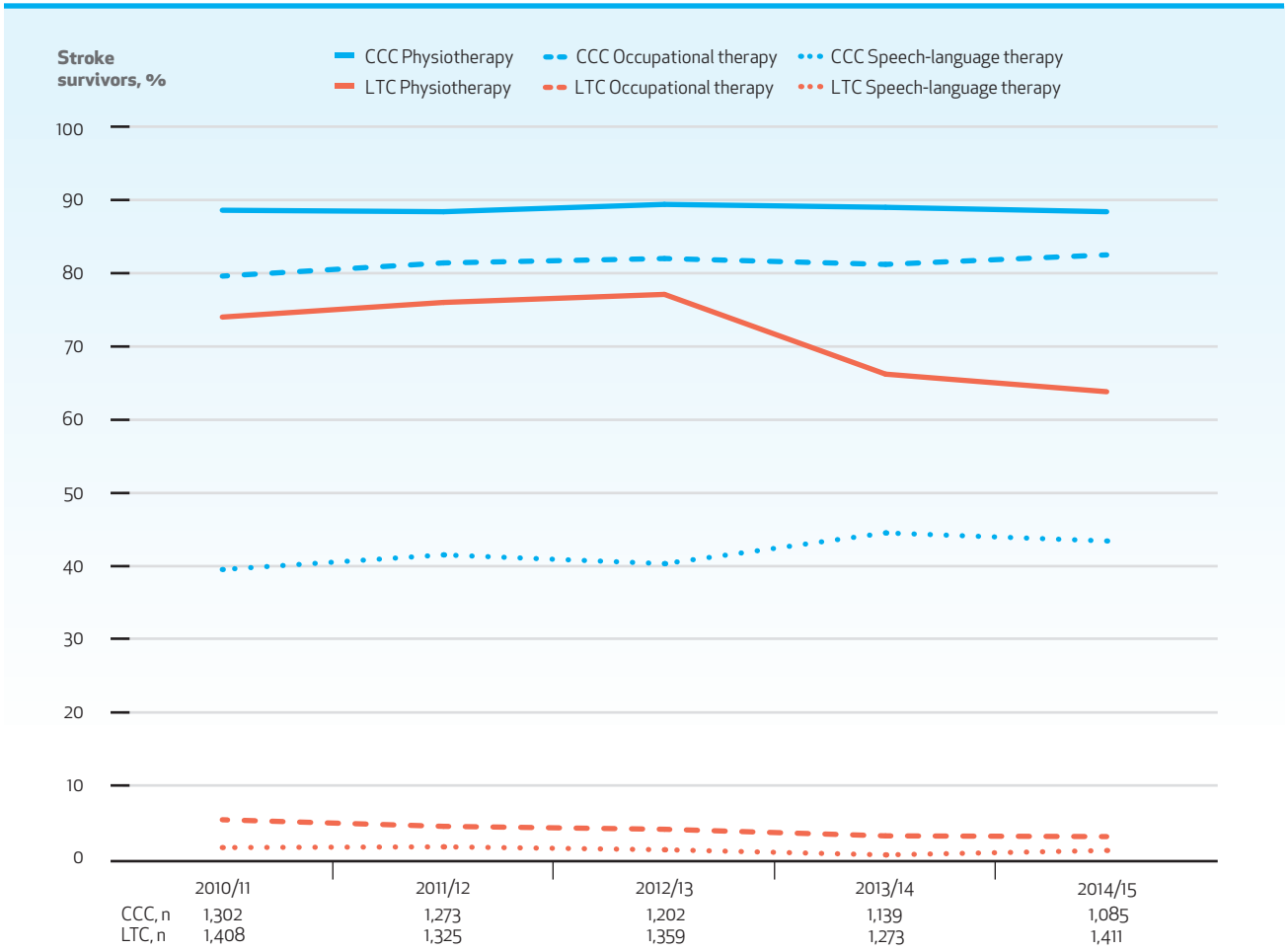
- Stroke survivors admitted directly to complex continuing care following their acute stroke or TIA hospitalization (journey 1) had the shortest total institutional stay.

- Stroke survivors admitted to inpatient rehabilitation prior to admission to long-term care (journeys 2, 4 and 5) had a shorter institutional stay than those admitted directly to long-term care following their acute stroke or TIA hospitalization.

- Between 2010/11 and 2014/15, the median length of stay in acute care decreased by 3 days for stroke survivors admitted to complex continuing care and by 1 day for those admitted to long-term care.

Rehabilitation

EXHIBIT 4.1A Proportion of stroke survivors who received rehabilitation therapy[1] in complex continuing care and long-term care, by type of therapy, in Ontario, 2010/11 to 2014/15

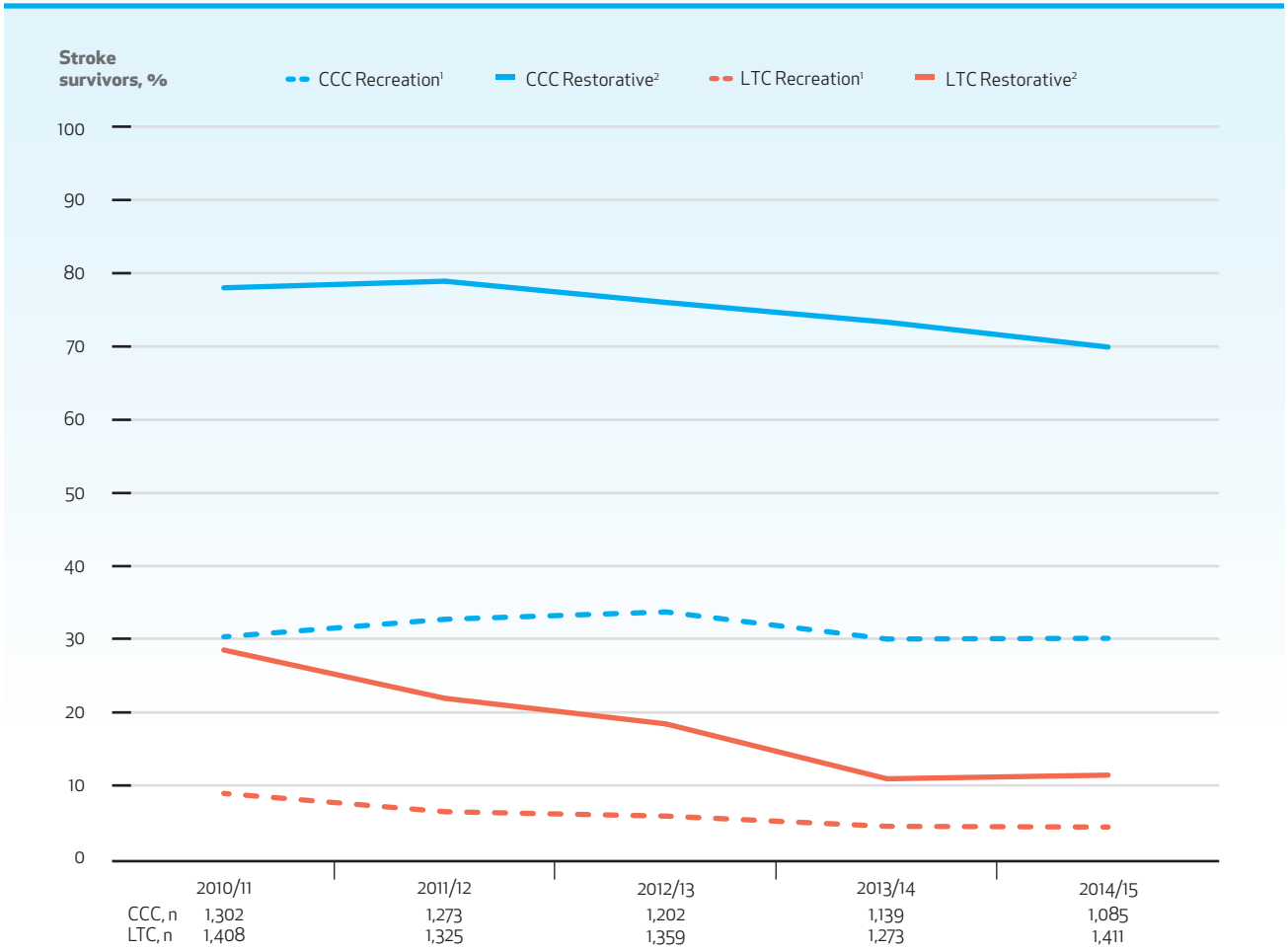


Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] These results are based on a 7-day look-back from the day of the full RAI-MDS 2.0 assessment, and therapy must have been provided for at least 15 minutes a day to be captured in the assessment.

EXHIBIT 4.1B Proportion of stroke survivors who received recreation therapy[1] or nursing restorative care[2] in complex continuing care and long-term care, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Therapy was provided in the 7 days prior to the full RAI-MDS 2.0 assessment.

[2] To qualify, a stroke survivor must have received any of the 11 restorative care interventions captured in the CCRS database for 15 or more minutes per day in the previous 7 days.

EXHIBIT 4.1C Total mean and median number of minutes in rehabilitation therapy[1] over 7 days for stroke survivors in complex continuing care and long-term care, by type of therapy, in Ontario, 2010/11 to 2014/15

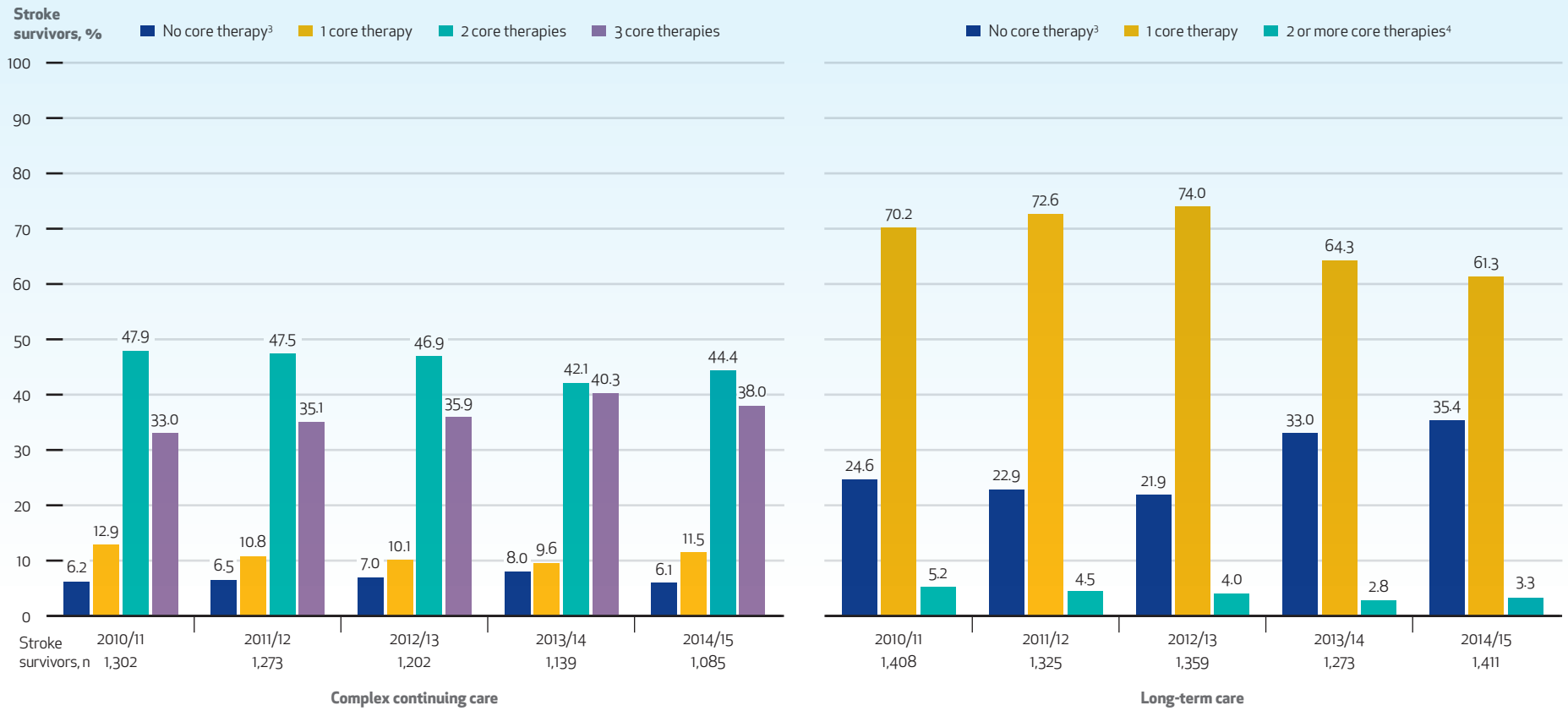
Type of Therapy	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
Complex continuing care					
Physiotherapy					
Survivors treated, n	1,153	1,125	1,075	1,014	959
Minutes, mean (median)	131.9 (110)	130.1 (110)	139.3 (120)	144.8 (120)	157.8 (140)
Occupational therapy					
Survivors treated, n	1,036	1,036	986	925	895
Minutes, mean (median)	124.0 (95)	116.6 (90)	126.5 (95)	134.8 (110)	147.8 (120)
Speech-language therapy					
Survivors treated, n	514	528	485	507	471
Minutes, mean (median)	85.9 (65)	85.8 (60)	91.8 (70)	105.0 (85)	109.7 (80)
Recreation therapy					
Survivors treated, n	395	416	405	342	327
Minutes, mean (median)	90.1 (60)	92.6 (60)	88.7 (60)	91.9 (60)	93.8 (60)
Long-term care					
Physiotherapy					
Survivors treated, n	1,042	1,007	1,048	843	900
Minutes, mean (median)	49.5 (45)	66.5 (45)	60.2 (45)	52.2 (45)	56.9 (45)
Occupational therapy					
Survivors treated, n	74	58	54	40	42
Minutes, mean (median)	44.0 (30)	76.0 (30)	30.1 (27.5)	41.9 (30)	45.1 (30)
Speech-language therapy					
Survivors treated, n	21	21	16	6	16
Minutes, mean (median)	35.0 (30)	41.9 (30)	30.0 (30)	40.0 (30)	57.2 (45)
Recreation therapy					
Survivors treated, n	126	85	79	56	60
Minutes, mean (median)	60.4 (45)	55.5 (30)	62.0 (30)	72.4 (45)	61.5 (45)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Therapy was provided in the 7 days prior to the full RAI-MDS 2.0 assessment.

EXHIBIT 4.2 Proportion of stroke survivors in complex continuing care and long-term care who received 0, 1, 2 or 3 core therapies,[1,2] in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The core therapies include physiotherapy, occupational therapy and speech-language therapy.

[2] These results are based on a 7-day look-back from the day of the full RAI-MDS 2.0 assessment, and therapy must have been provided for at least 15 minutes a day to be captured in the assessment.

[3] Recreation therapy may have been received.

[4] Therapies were combined for reasons of privacy and confidentiality.

FINDINGS – REHABILITATION

Exhibit 4.1a

These results are based on a 7-day look-back from the day of the full assessment; therapy must have been provided for at least 15 minutes a day to be captured in the assessment. Between 2010/11 and 2014/15, the proportion of stroke survivors in complex continuing care who received a core therapy remained stable at approximately 90% for physiotherapy, 80% for occupational therapy and 40% for speech-language therapy. Between 2012/13 and 2014/15, the proportion of stroke survivors receiving speech-language therapy increased slightly by about 3%. In the long-term care setting, the proportion of stroke survivors who received a core therapy between 2010/11 and 2014/15 remained unchanged at less than 6% for occupational therapy and speech-language therapy, and decreased by 10% for physiotherapy.

Exhibit 4.1b

Between 2010/11 and 2014/15, the proportion of stroke survivors receiving restorative care decreased from 78.0% to 69.9% in complex continuing care and from 28.5% to 11.4% in long-term care. These results are based on a 7-day look-back from the day of the full assessment and restorative care must have been provided for at least 15 minutes a day in order to be captured in the RAI-MDS 2.0 assessment. In the same five-year period, the proportion of stroke survivors receiving recreation therapy remained stable at about 30% in complex continuing care and dropped from 8.9% to 4.3% in long-term care.

Exhibit 4.1c

Between 2010/11 and 2014/15, the overall number of minutes of core rehabilitation therapy received over 7 days by stroke survivors in complex continuing care increased, with the median time rising from 110 to 140 minutes for physiotherapy, from 95 to 120 minutes for occupational therapy, and from 65 to 80 minutes for speech-language therapy. Given that time spent in therapist-supervised core rehabilitation is calculated over a 7-day period, these amounts translate to a median of 11, 17 and 20 minutes per day of speech-language therapy, occupational therapy and physiotherapy, respectively. The median number of minutes of physiotherapy received per day in long-term care was 6.4. Over the 5 years, the median amount of time stroke survivors spent in recreation therapy remained unchanged for both the complex continuing care and long-term care settings (60 minutes and 45 minutes, respectively).

Exhibit 4.2

Among stroke survivors in complex continuing care, 38.0% received all three core therapies, 44.4% received two and 11.5% received one. Among survivors in long-term care, 3.3% received two or more core therapies, 61.3% received one and 35.4% received no therapist-supervised rehabilitation.

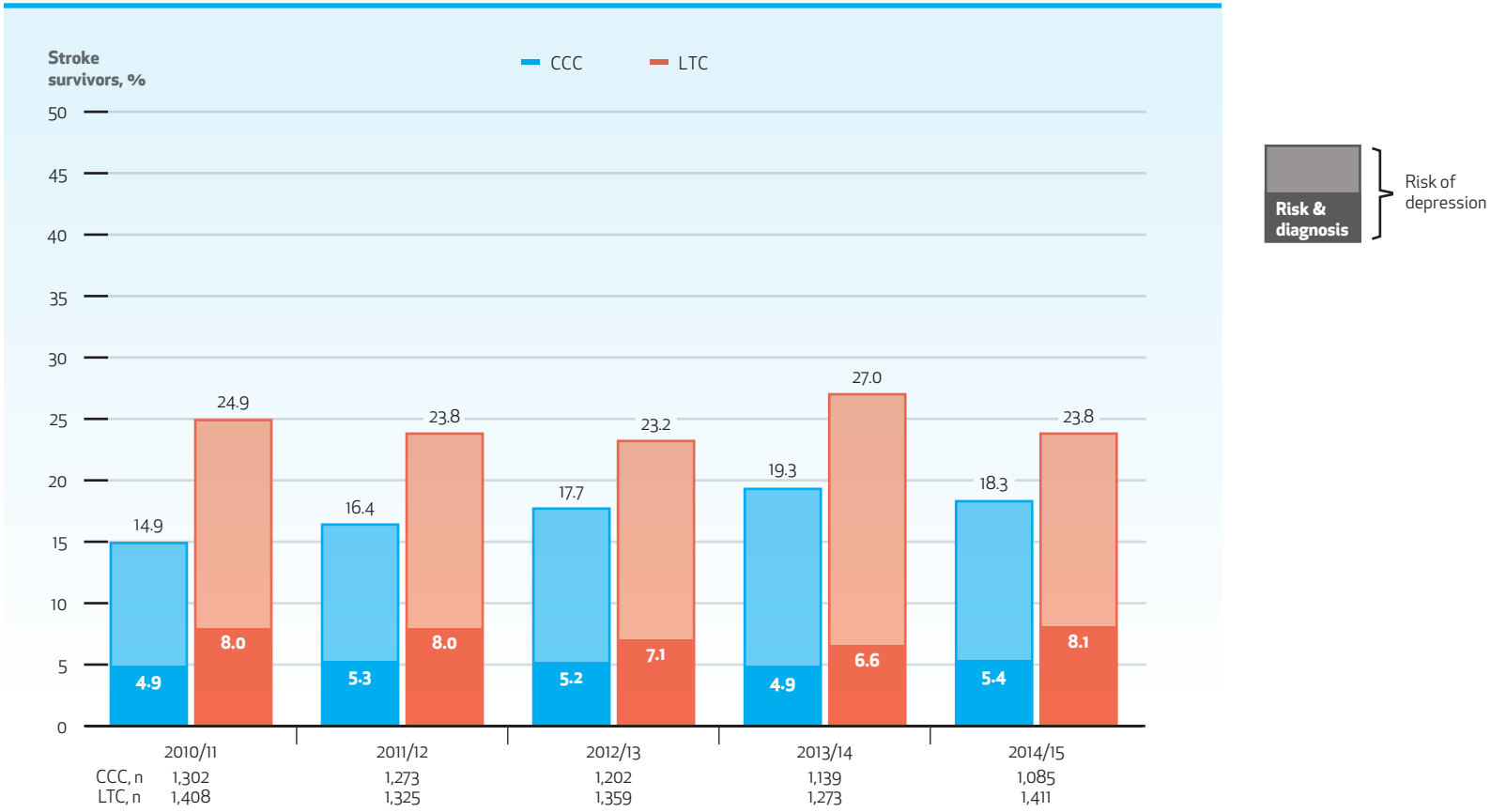
HIGHLIGHTS

- Between 2010/11 and 2014/15, there was little change in the proportion of stroke survivors in complex continuing care receiving core therapies, with almost 90% receiving physiotherapy; 80%, occupational therapy; and 40%, speech-language therapy. In the same period, the daily median participation time for physiotherapy was 20 minutes; for occupational therapy, 17 minutes; and for speech-language therapy, 11 minutes.
- The proportion of stroke survivors in long-term care who received physiotherapy decreased from 74.0% in 2010/11 to 63.8% in 2014/15; there was minimal provision of occupational therapy and speech-language therapy in that period. The median number of minutes of physiotherapy received per day in long-term care was 6.4.
- Between 2010/11 and 2014/15, the proportion of stroke survivors receiving restorative care declined from 78.0% to 69.9% in complex continuing care and from 28.5% to 11.4% in long-term care. In the same period, the proportion of stroke survivors receiving recreation therapy remained stable at about 30% in complex continuing care and dropped from 8.9% to 4.3% in long-term care.

Stroke Best Practice Care

Depression

EXHIBIT 5.1 Proportion of stroke survivors in complex continuing care and long-term care who were diagnosed with depression or were at risk for depression,[1] in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The Depression Rating Scale, which assesses risk for depression, ranges from 1 to 14; a score of 3 or higher may indicate a potential or actual problem with depression and the survivor should be assessed or screened for depression.

Impaired Cognition

EXHIBIT 6.1 Proportion of stroke survivors in complex continuing care and long-term care with impaired cognition, by Cognitive Performance Scale score,[1] in Ontario, 2010/11 to 2014/15

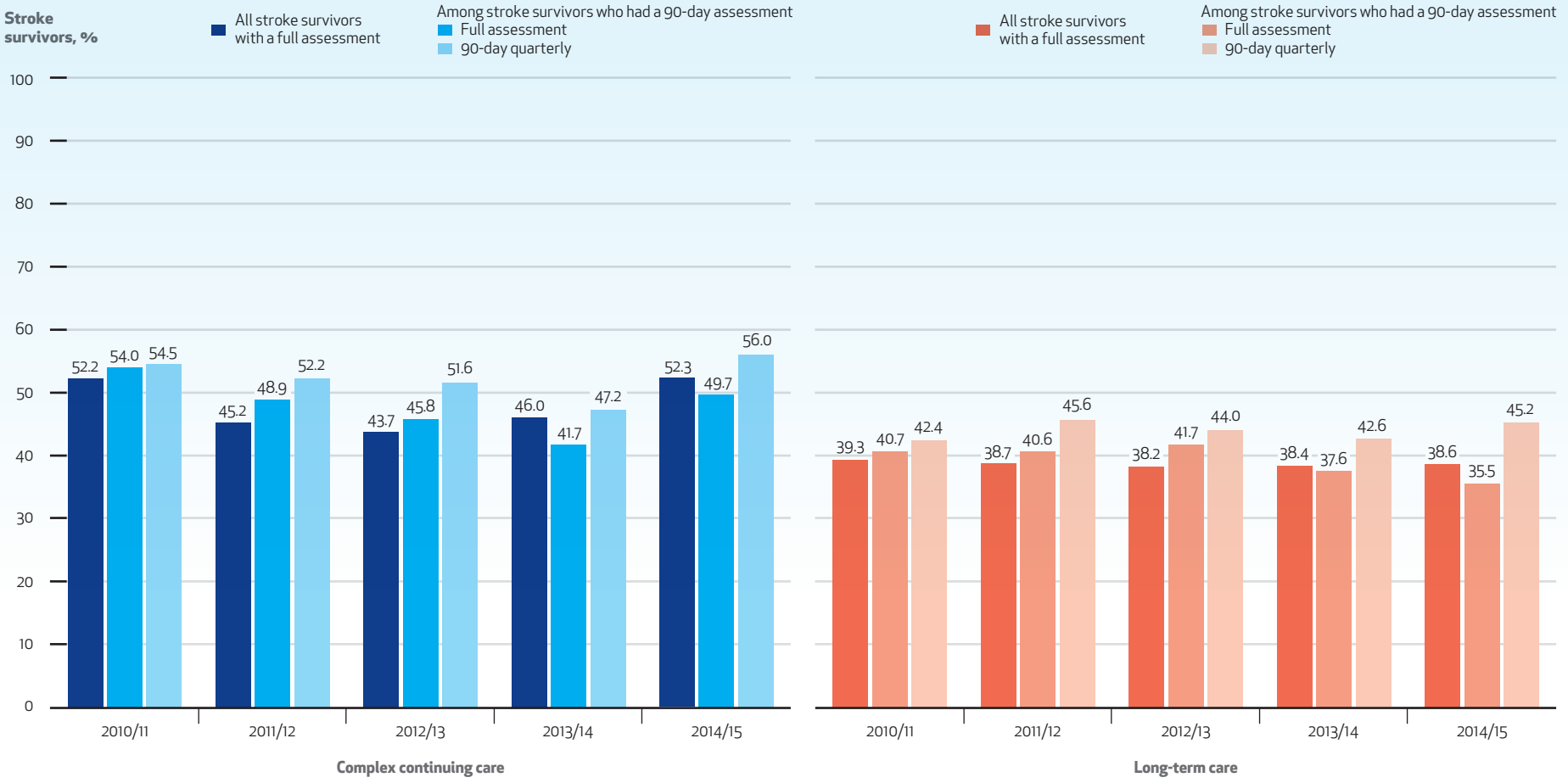
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The RAI-MDS 2.0 Cognitive Performance Scale ranges from 0 to 6. Stroke survivors were categorized as cognitively intact (0), mildly impaired (1 to 2), moderately impaired (3) and or severely impaired (4 to 6).

Social Engagement

EXHIBIT 7.1 Proportion of stroke survivors in complex continuing care and long-term care who were socially engaged[1] with a cognitive performance score[2] of 0 to 3 at their full and 90-day quarterly RAI-MDS 2.0 assessments, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

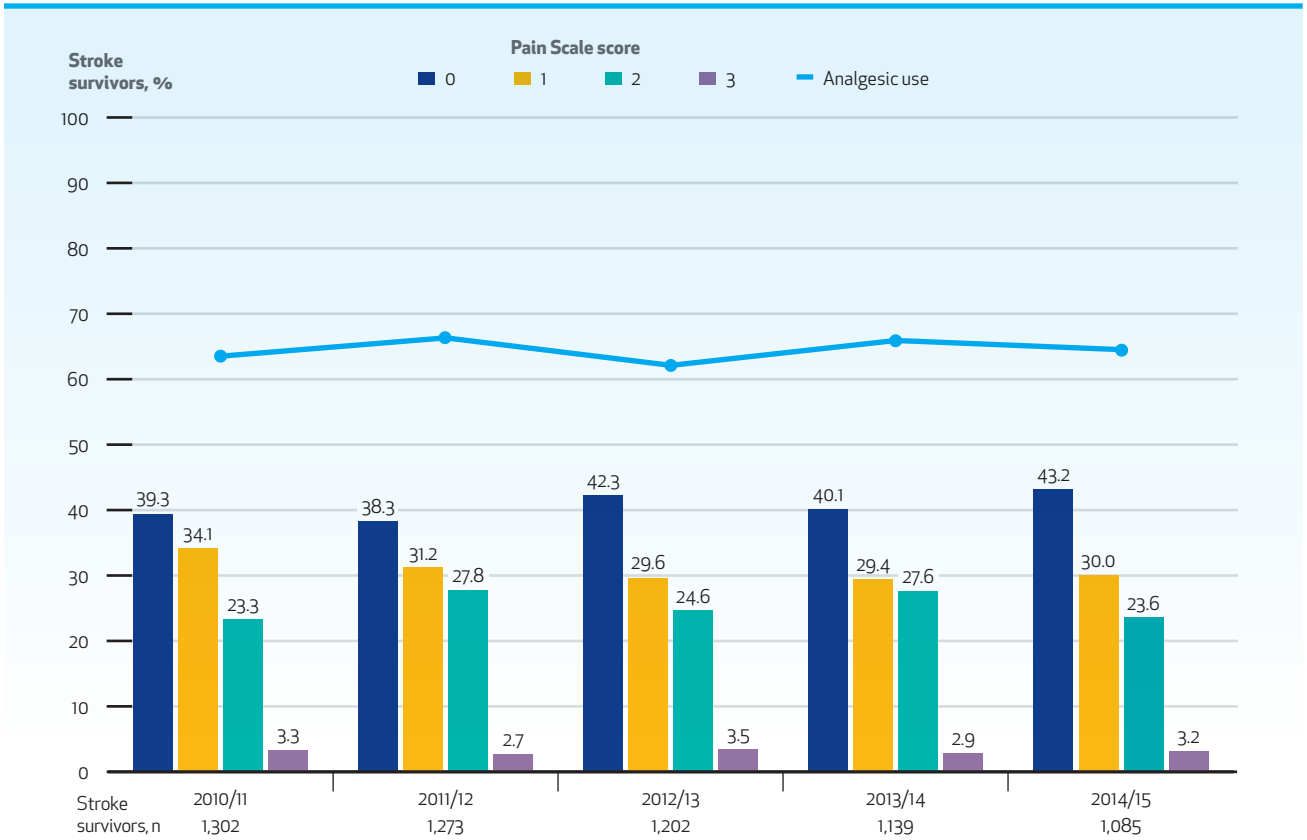
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care, and had a length of stay in complex continuing care or long-term care of 14 days or more, a full RAI-MDS 2.0 assessment after the acute stroke or TIA, and a Cognitive Performance Scale score of 0 to 3.

[1] The Index of Social Engagement (ISE) measures the resident's social functioning, which is generally affected by his or her physical and mental functional abilities. The scale is based on an RAI-MDS 2.0 assessment item that includes ease in interacting with others, participation in planned and self-initiated activities and in establishing goals. The ISE ranges from 0 to 6. Stroke survivors with a score of 4 to 6 were deemed to be socially engaged.

[2] The RAI-MDS 2.0 Cognitive Performance Scale ranges from 0 to 6, where 0 is cognitively intact and 6 is very severe cognitive impairment.

Pain

EXHIBIT 8.1A Proportion of stroke survivors in complex continuing care who experienced pain, by Pain Scale score,[1] and overall analgesic use, in Ontario, 2010/11 to 2014/15

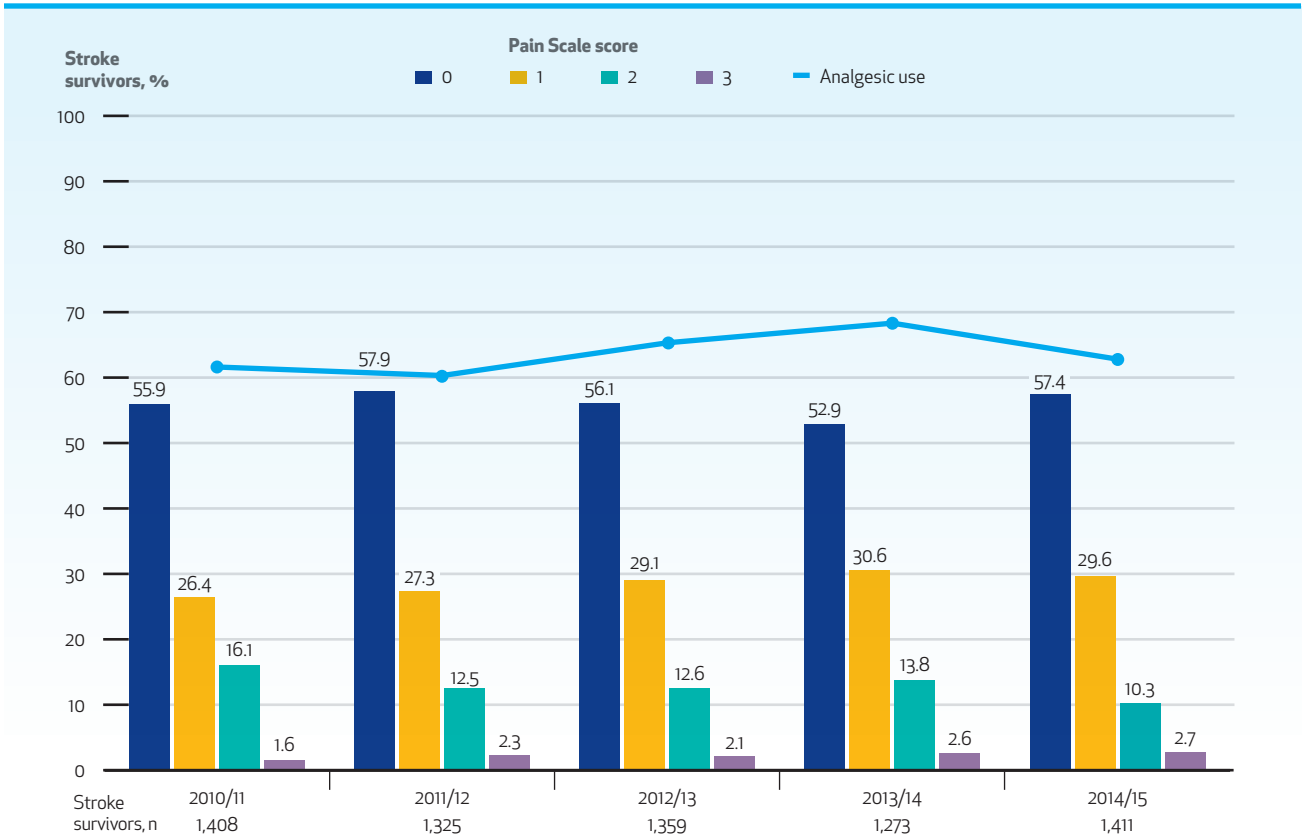


Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The RAI-MDS 2.0 Pain Scale 2.0 ranges from 0 to 3. The Pain Scale combines the frequency and intensity of pain, which is unrelieved by treatment(s), as observed by facility staff through the RAI-MDS 2.0 assessment process. A score of 0 indicates no pain, 1 indicates less than daily pain, 2 indicates daily pain but not severe and 3 indicates daily severe pain. The score is estimated from pain experienced in the 7 days prior to the full RAI-MDS 2.0 assessment.

EXHIBIT 8.1B Proportion of stroke survivors in long-term care who experienced pain, by Pain Scale score,[1] and overall analgesic use, in Ontario, 2010/11 to 2014/15

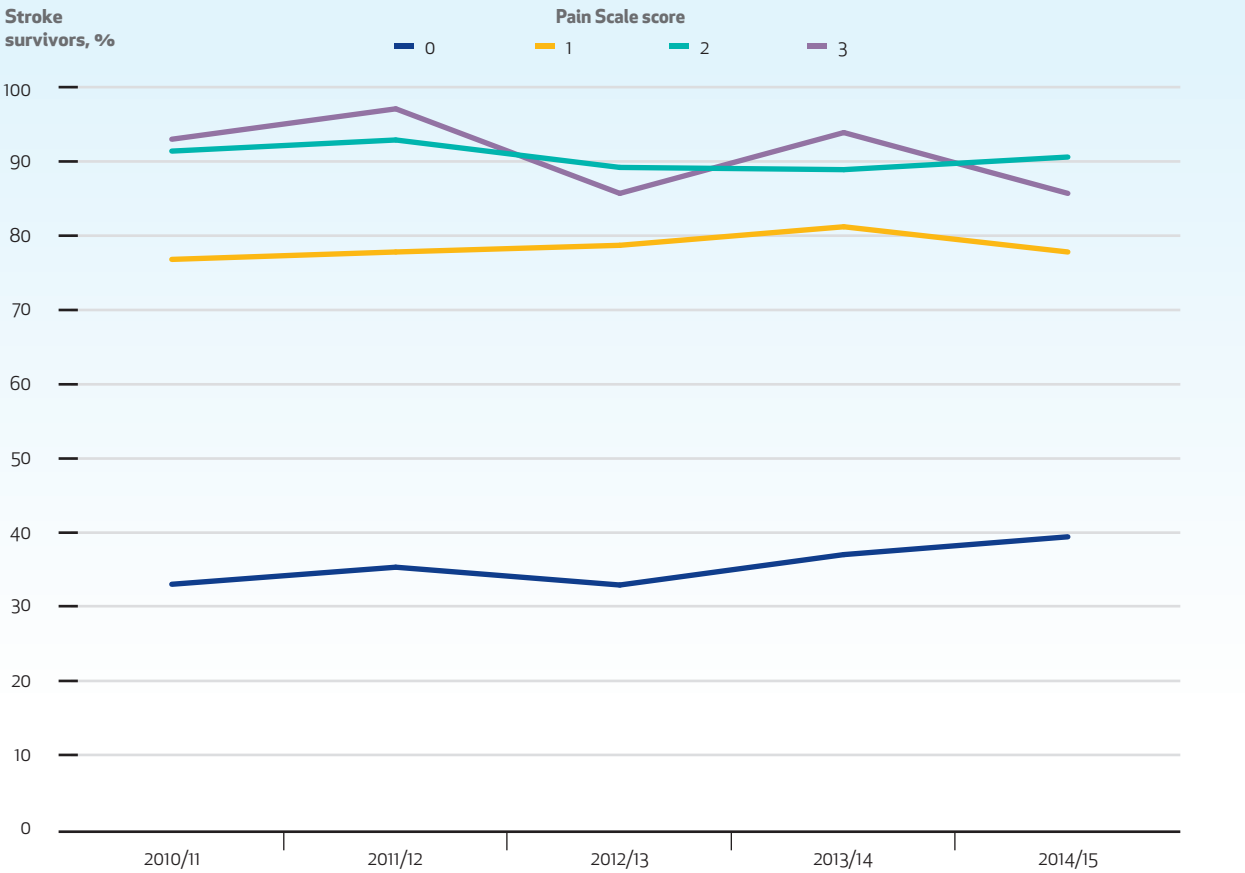


Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The Pain Scale ranges from 0 to 3. A score of 0 indicates no pain, 1 indicates less than daily pain, 2 indicates daily moderate pain and 3 indicates daily severe pain. The score is estimated from pain experienced in the 7 days prior to the full RAI-MDS 2.0 assessment.

EXHIBIT 8.2A Proportion of stroke survivors in complex continuing care who took analgesics, by Pain Scale score,[1] in Ontario, 2010/11 to 2014/15

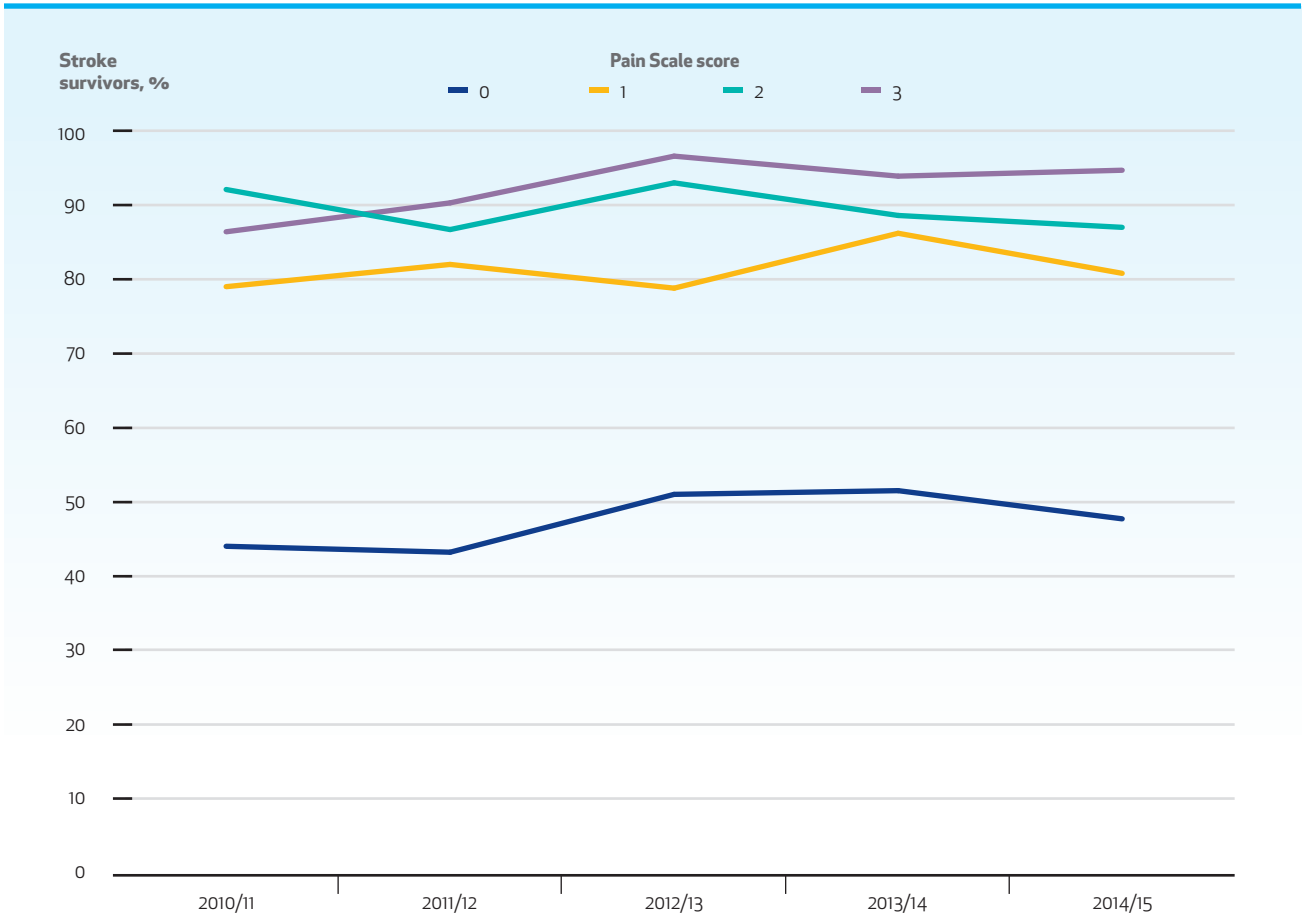


Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The Pain Scale ranges from 0 to 3. A score of 0 indicates no pain, 1 indicates less than daily pain, 2 indicates daily moderate pain and 3 indicates daily severe pain. The score is estimated from pain experienced in the 7 days prior to the full RAI-MDS 2.0 assessment.

EXHIBIT 8.2B Proportion of stroke survivors in long-term care who took analgesics, by Pain Scale score,[1] in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS-LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The Pain Scale ranges from 0 to 3. A score of 0 indicates no pain, 1 indicates less than daily pain, 2 indicates daily moderate pain and 3 indicates daily severe pain. The score is estimated from pain experienced in the 7 days prior to the full RAI-MDS 2.0 assessment.

EXHIBIT 8.3A Proportion of stroke survivors in complex continuing care with full and 90-day quarterly RAI-MDS 2.0 assessments who experienced daily pain[1] in the 7 days prior to assessment, in Ontario, 2010/11 to 2014/15

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more, a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a quarterly assessment at 90 days.

[1]Daily pain includes Pain Scale scores of 2 or 3, where 2 indicates daily moderate pain and 3 indicates daily severe pain.

EXHIBIT 8.3B Proportion of stroke survivors in long-term care with full and 90-day quarterly RAI-MDS assessments who experienced daily pain[1] in the 7 days prior to assessment, in Ontario, 2010/11 to 2014/15

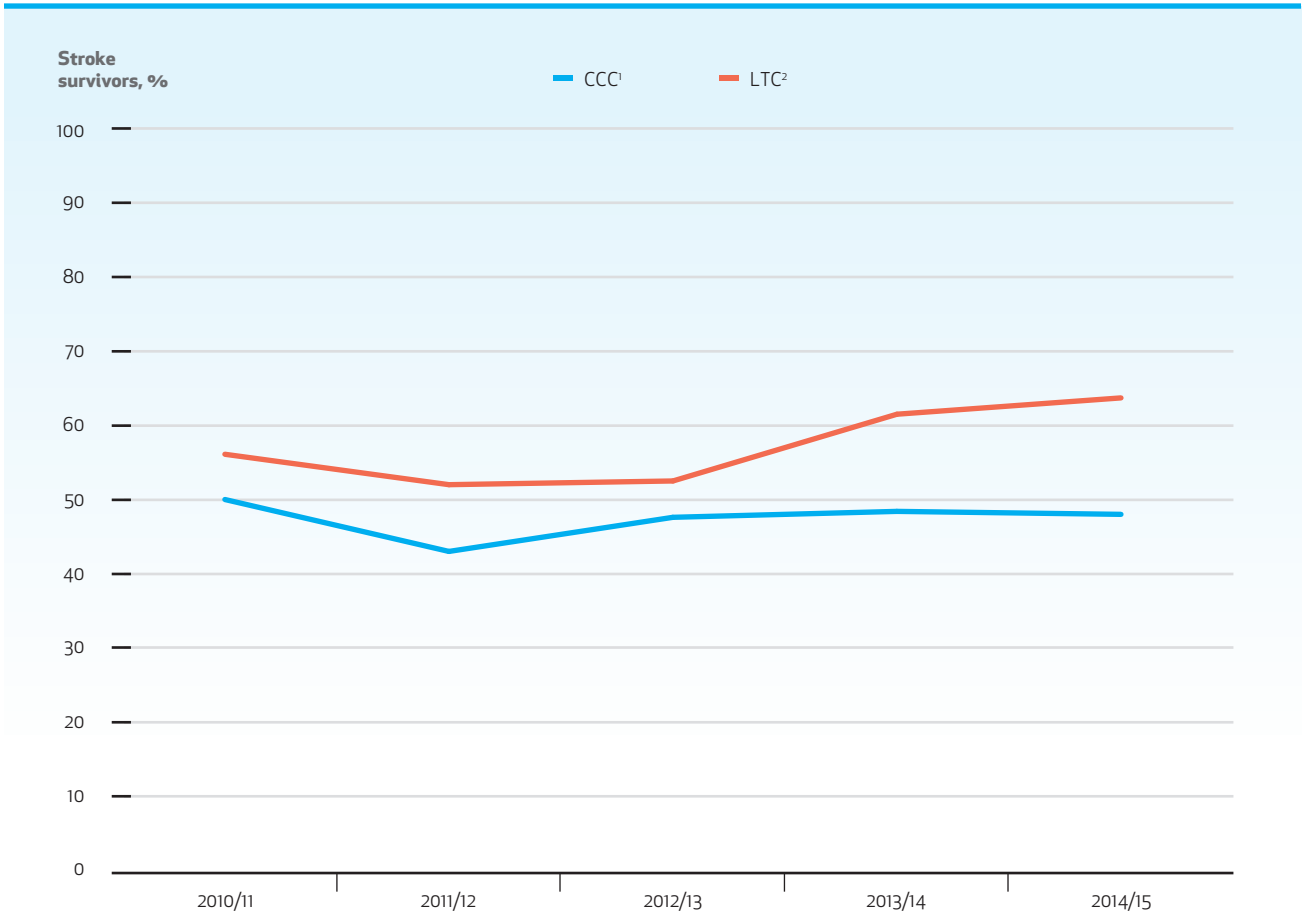
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS-LTC 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS-LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more, a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a quarterly assessment at 90 days.

[1]Daily pain includes Pain Scale scores of 2 or 3, where 2 indicates daily moderate pain and 3 indicates daily severe pain.

Medication Use

EXHIBIT 9.1 Proportion of stroke survivors aged 65 and older with atrial fibrillation in complex continuing care and long-term care who filled a prescription for anticoagulant therapy within 90 days of discharge, in Ontario, 2010/11 to 2014/15



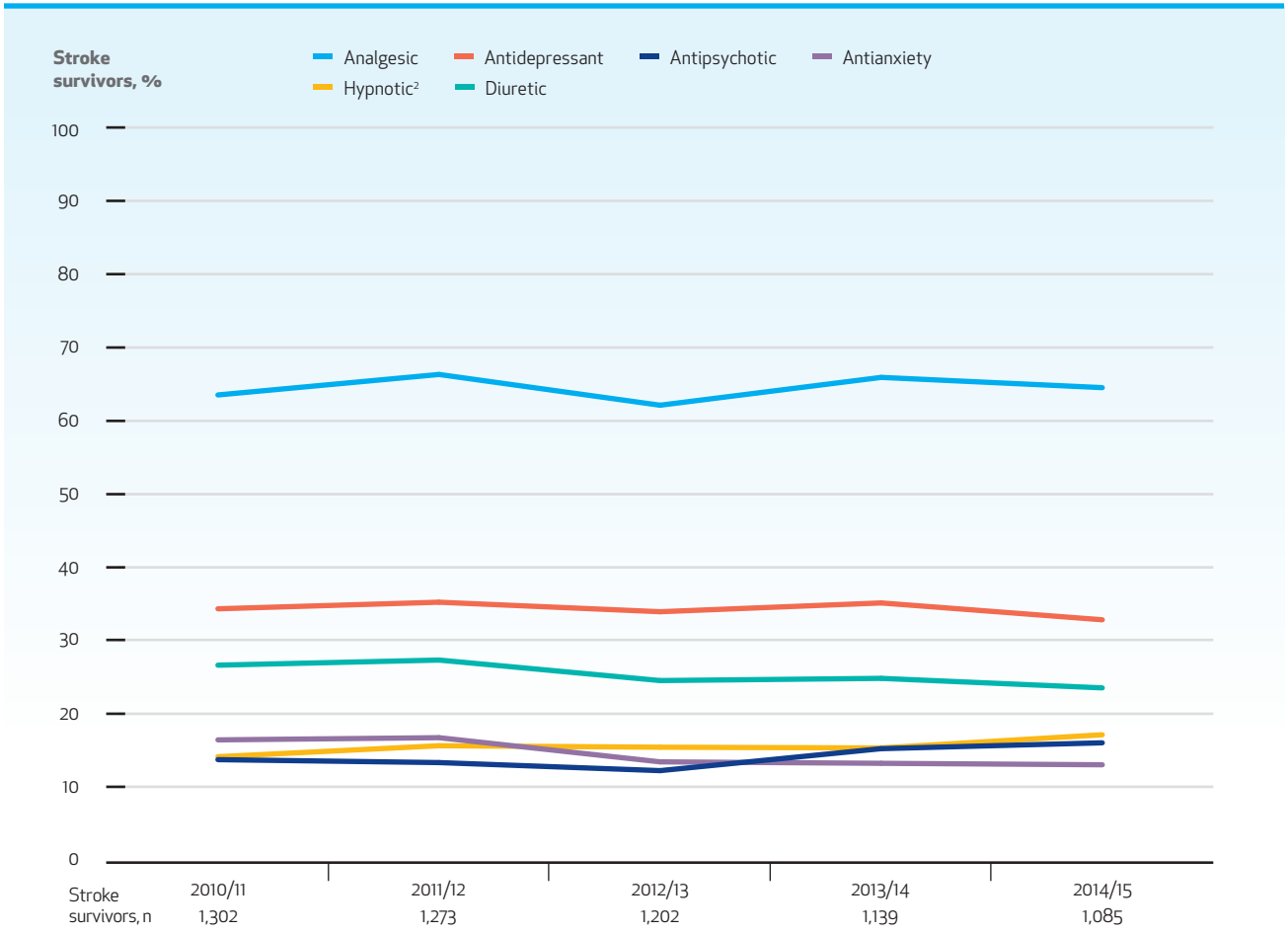
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, CCRS-LTC and ODB, 2010/11 to 2015/16.

Inclusion criteria: All survivors 65 years of age and older discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA

[1] Within 90 days of discharge from complex continuing care.

[2] Within 90 days of discharge from acute care.

EXHIBIT 9.2A Proportion of stroke survivors in complex continuing care who received key medications,[1] in Ontario, 2010/11 to 2014/15



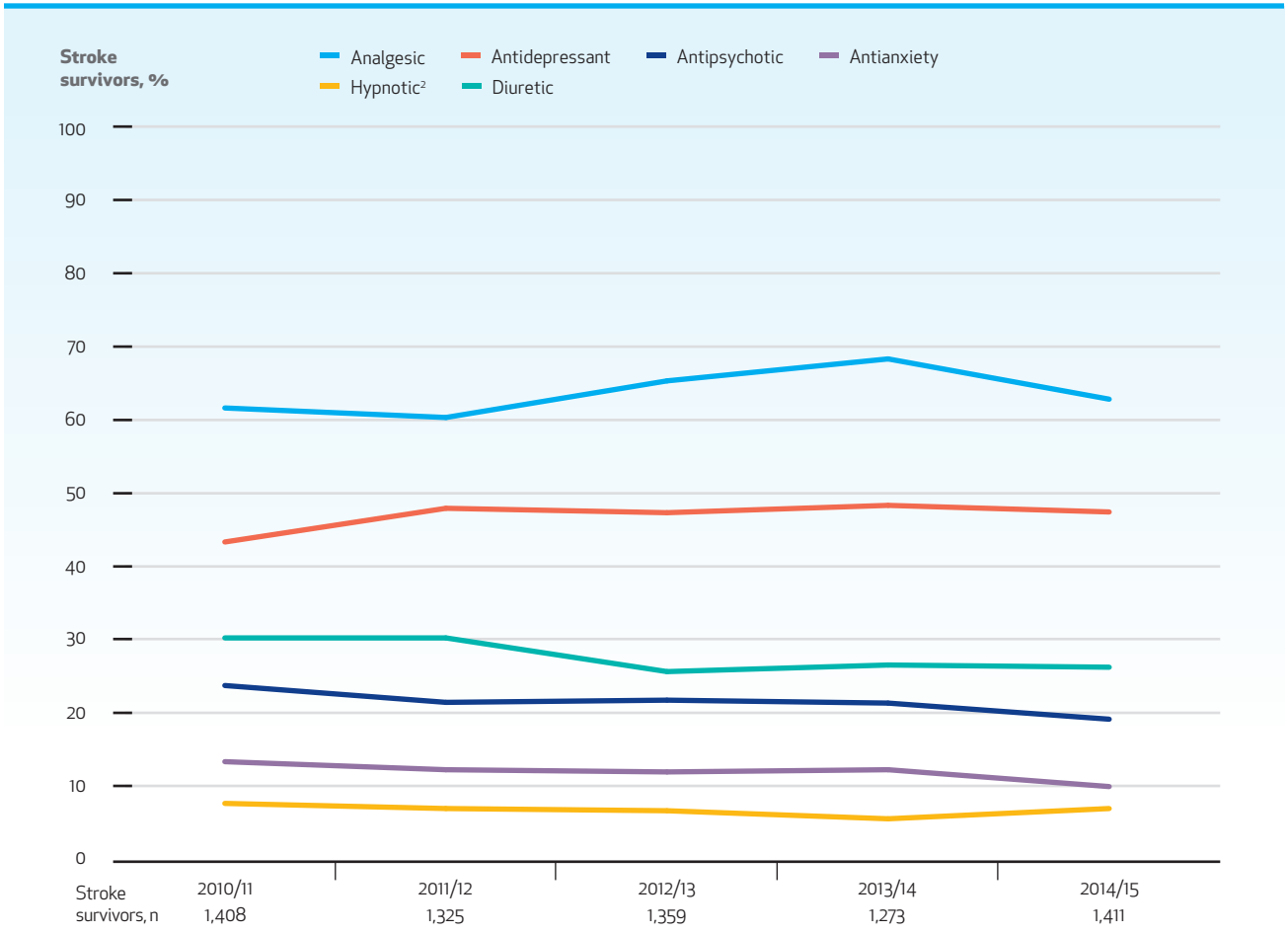
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The frequency of administration and the dosage were not factored into the inclusion criteria. Stroke survivors who received a medication once in the 7 days prior to the full RAI-MDS 2.0 assessment were included.

[2] Hypnotics may include sleeping pills.

EXHIBIT 9.2B Proportion of stroke survivors in long-term care who received key medications,[1] in Ontario, 2010/11 to 2014/15



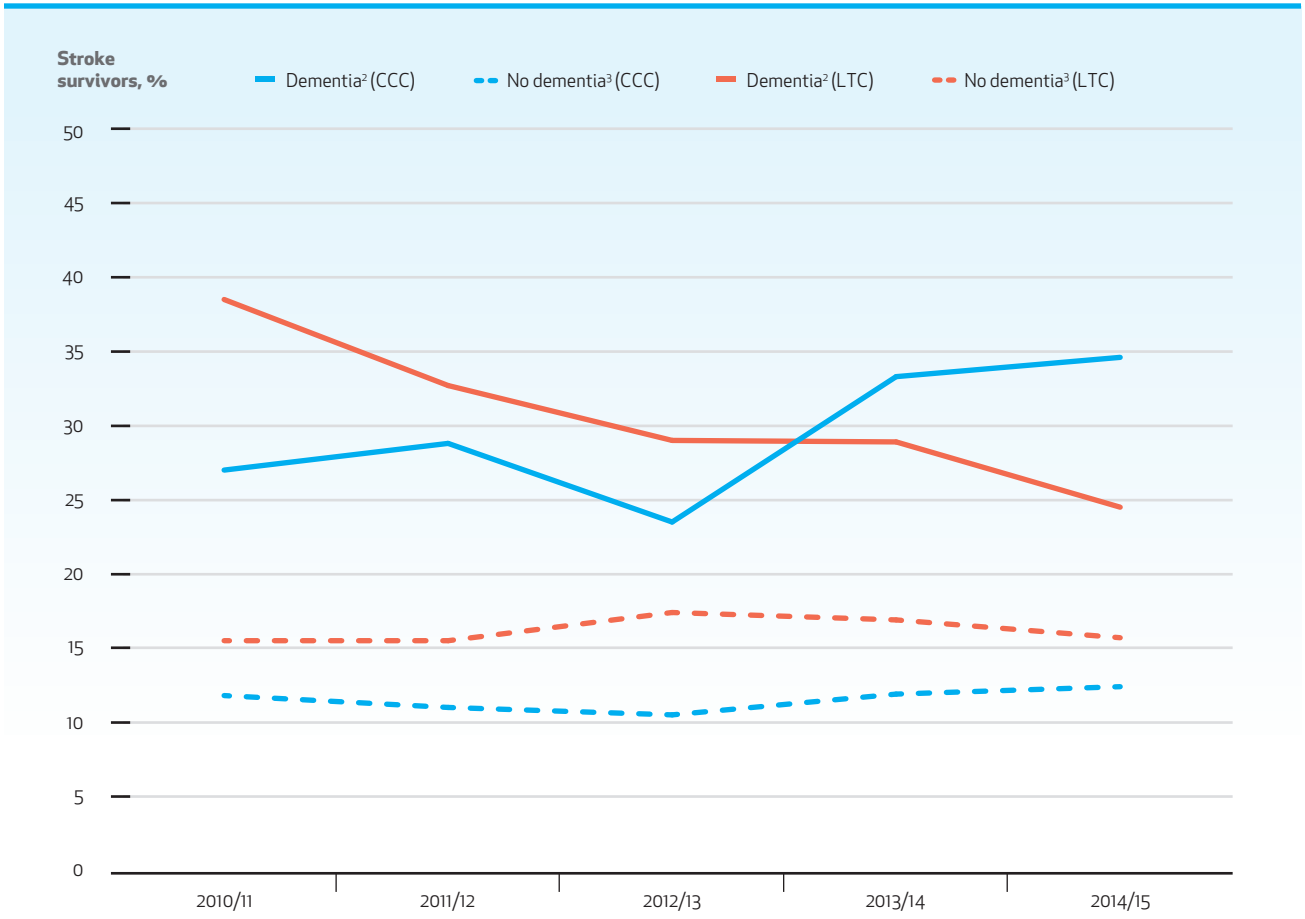
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS-LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The frequency of administration and the dosage were not factored into the inclusion criteria. Stroke survivors who received a medication once in the 7 days prior to the full RAI-MDS 2.0 assessment were included.

[2] Hypnotics may include sleeping pills.

EXHIBIT 9.3A Proportion of stroke survivors with and without dementia in complex continuing care and long-term care who received antipsychotic medication,[1] in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

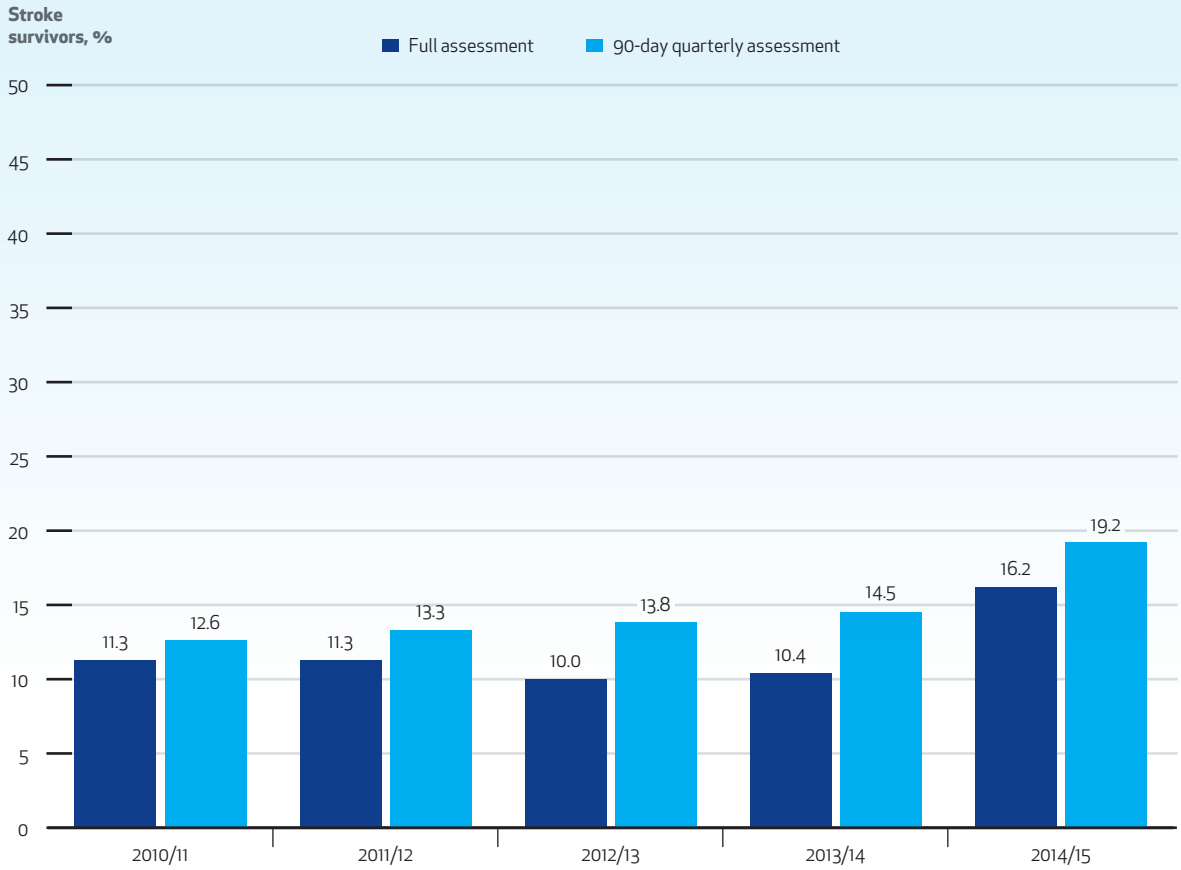
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The frequency of administration or the dosage were not factored into the inclusion criteria. Stroke survivors who received a medication once in the 7 days prior to the full RAI-MDS 2.0 assessment were included.

[2] Among survivors who had a diagnosis of dementia in their RAI-MDS 2.0 assessment.

[3] Among survivors who did not have a diagnosis of dementia in their RAI-MDS 2.0 assessment.

EXHIBIT 9.3B Proportion of stroke survivors without dementia[1] in complex continuing care with full and 90-day quarterly RAI-MDS 2.0 assessments who received antipsychotic medication in the 7 days prior to assessment,[2] in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care, had a length of stay in complex continuing care of 14 days or more, a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a quarterly assessment at 90 days.

[1] Among survivors who did not have a diagnosis of dementia at the time of their full RAI-MDS 2.0 assessment.

[2] The frequency of administration or the dosage were not factored into the inclusion criteria. Stroke survivors who received a medication once in the 7 days prior to the full RAI-MDS 2.0 assessment were included.

EXHIBIT 9.3C Proportion of stroke survivors without dementia[1] in long-term care with full and 90-day quarterly RAI-MDS 2.0 assessments who received antipsychotic medication in the 7 days prior to assessment,[2] in Ontario, 2010/11 to 2014/15

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

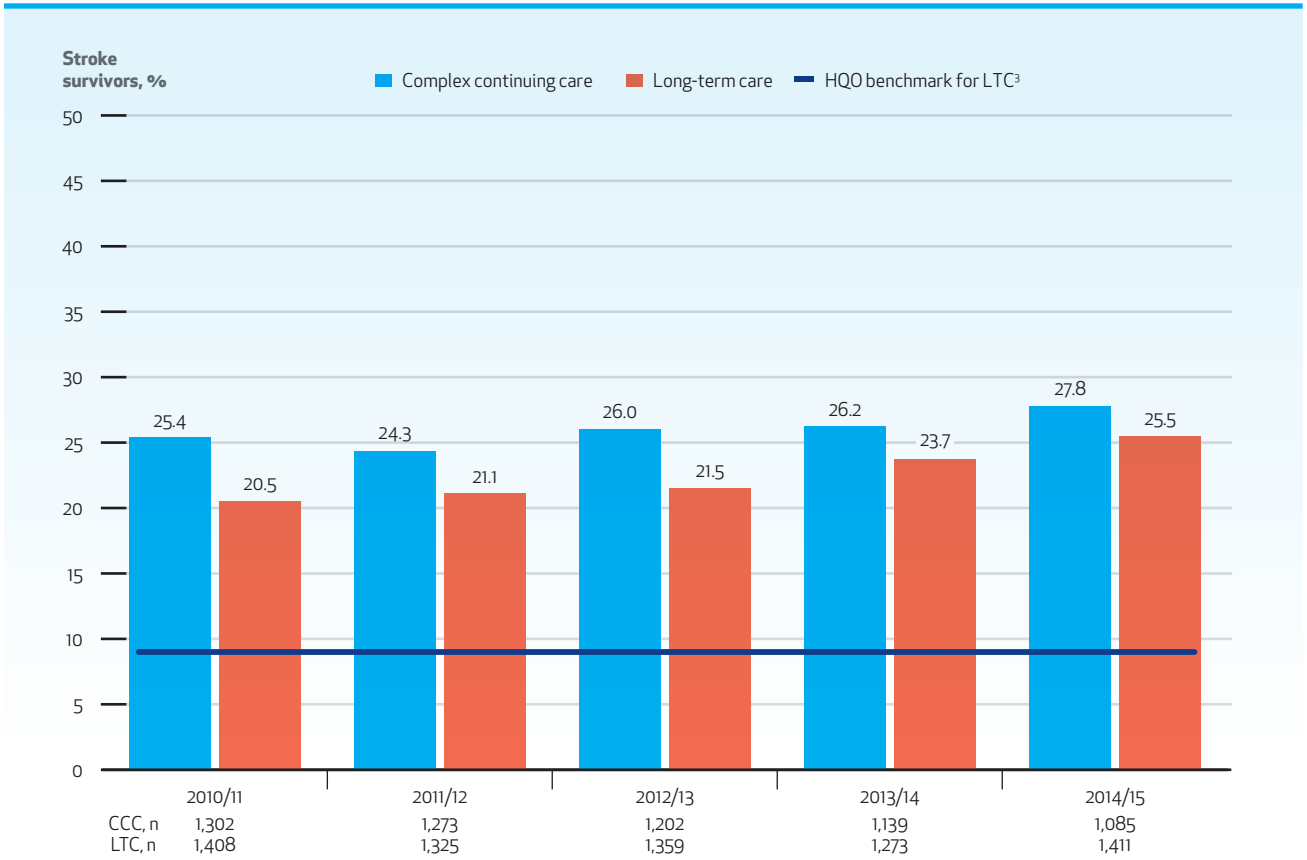
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care, had a length of stay in long-term care of 14 days or more, a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a quarterly assessment at 90 days.

[1] Among survivors who did not have a diagnosis of dementia at the time of their full RAI-MDS 2.0 assessment.

[2] The frequency of administration or the dosage were not factored into the inclusion criteria. Stroke survivors who received a medication once in the 7 days prior to the full RAI-MDS 2.0 assessment were included.

Falls

EXHIBIT 10.1A Proportion of stroke survivors in complex continuing care and long-term care who had a fall[1,2] in the 30 days prior to a full RAI-MDS 2.0 assessment, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS-LTC, 2010/11 to 2015/16.

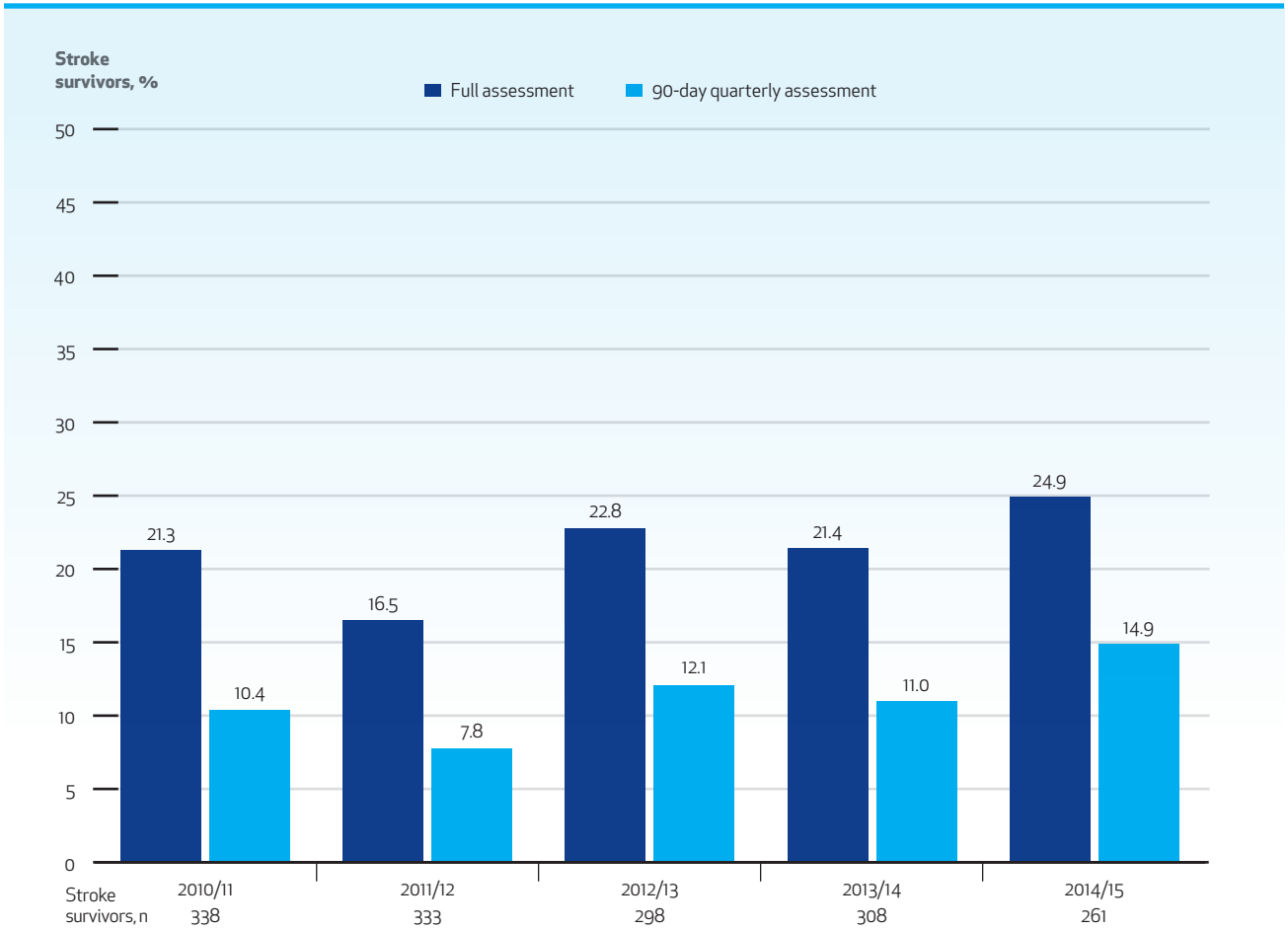
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] A fall is defined as any unintentional change in position where the resident ends up on the floor, ground or other lower level. Includes falls with or without injury.[23]

[2] Only falls experienced and reported in the 30 days before the full assessment date were captured; therefore, a fall may have occurred prior to admission to complex continuing care or long-term care.

[3] Benchmark set by Health Quality Ontario.[19]

EXHIBIT 10.1B Proportion of stroke survivors in complex continuing care with full and 90-day quarterly RAI-MDS 2.0 assessments who had a fall[1,2] in the 30 days prior to assessment, in Ontario, 2010/11 to 2014/15



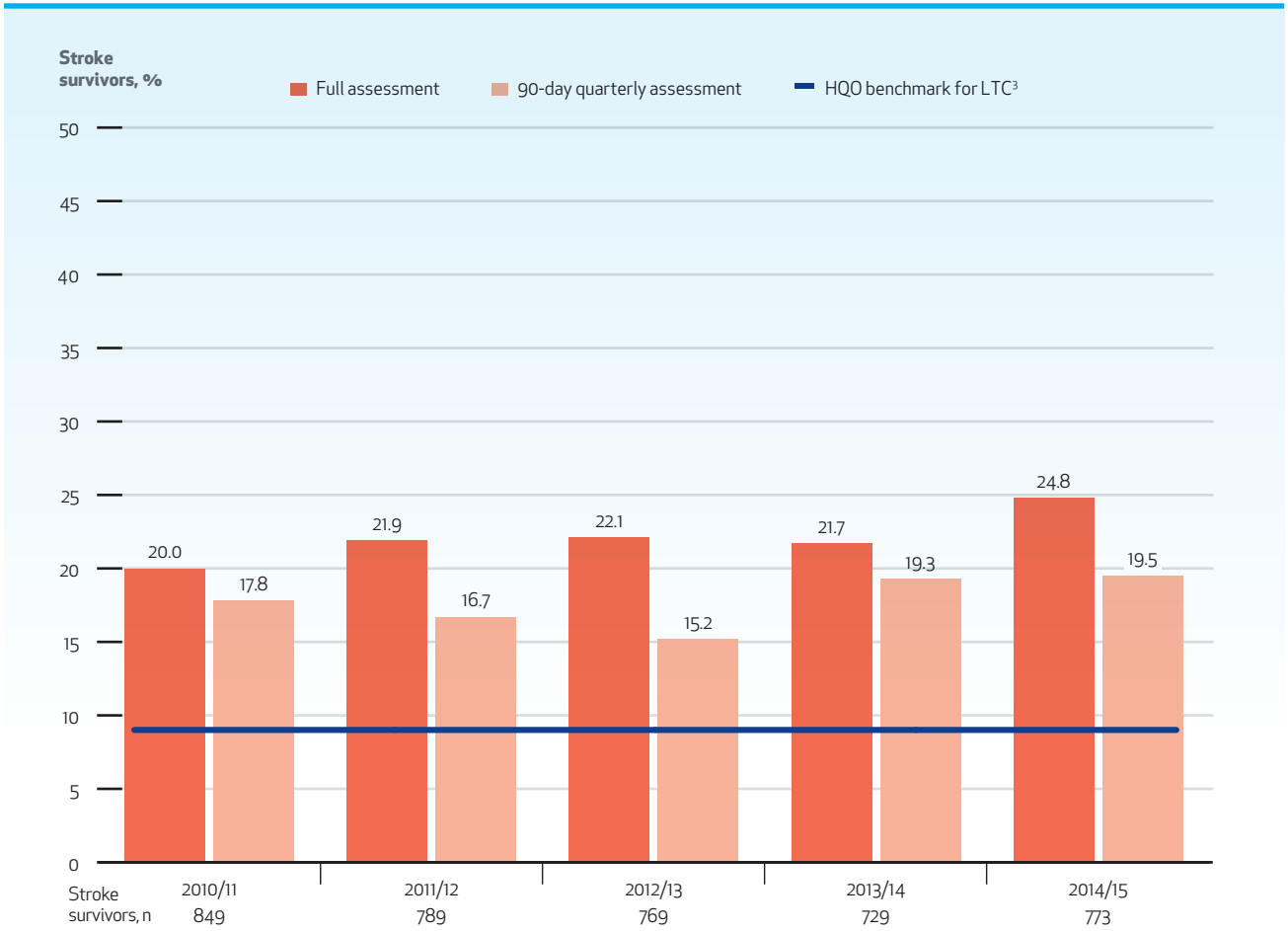
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more, a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a quarterly assessment at 90 days.

[1] A fall is defined as any unintentional change in position where the resident ends up on the floor, ground or other lower level. Includes falls with or without injury.[23]

[2] Falls experienced and reported in the 30 days before the full assessment may have occurred prior to admission to complex continuing care.

EXHIBIT 10.1C Proportion of stroke survivors in long-term care with full and 90-day quarterly RAI-MDS 2.0 assessments who had a fall[1,2] in the 30 days prior to assessment, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS-LTC, 2010/11 to 2015/16.

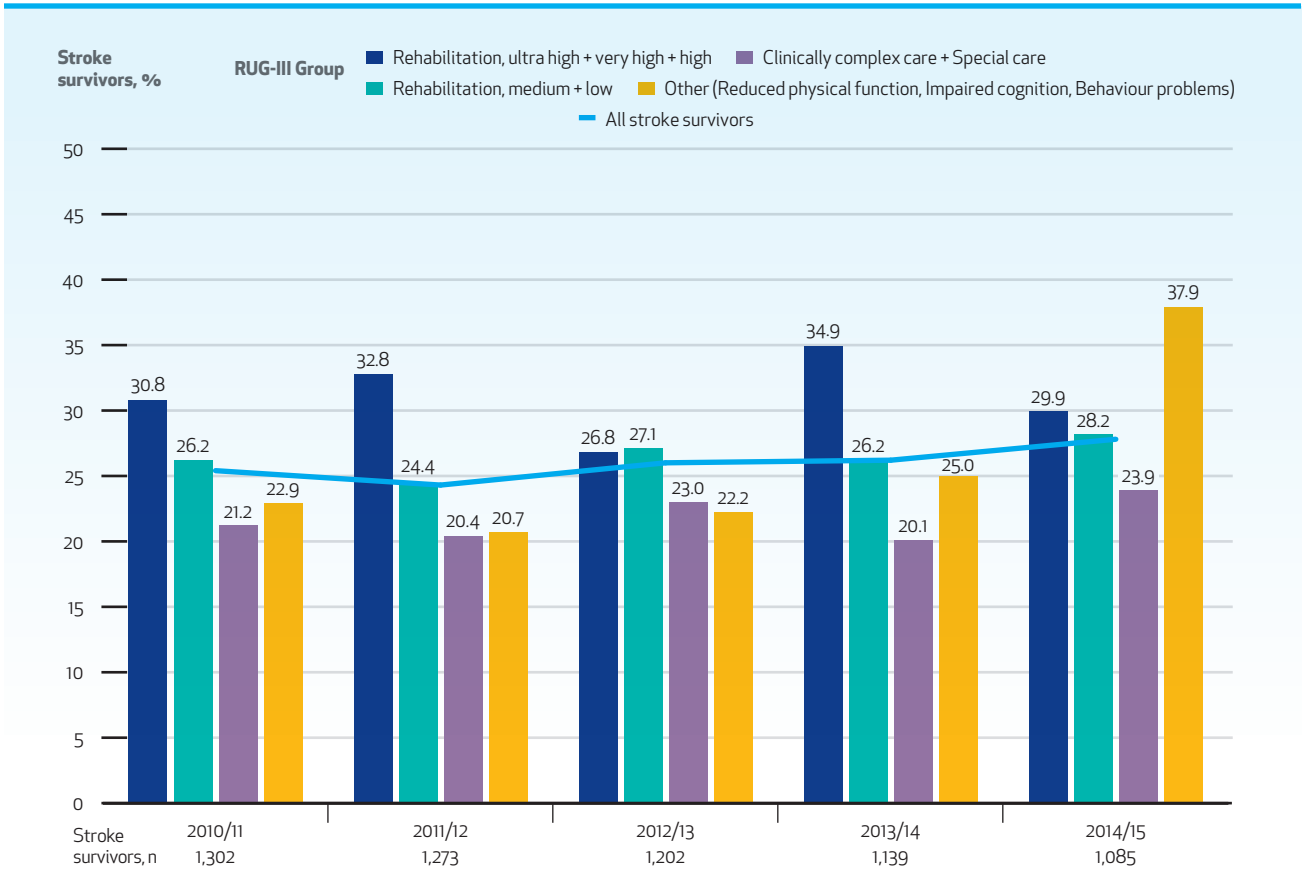
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more, a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a quarterly assessment at 90 days.

[1] A fall is defined as any unintentional change in position where the resident ends up on the floor, ground or other lower level; includes falls with or without injury.[23]

[2] Falls experienced and reported in the 30 days before the full assessment date may have occurred prior to admission to long-term care.

[3] Benchmark set by Health Quality Ontario.[19]

EXHIBIT 10.2A Proportion of stroke survivors in complex continuing care who had a fall in the 30 days prior to a full RAI-MDS 2.0 assessment,[1,2] by RUG-III group, in Ontario, 2010/11 to 2014/15



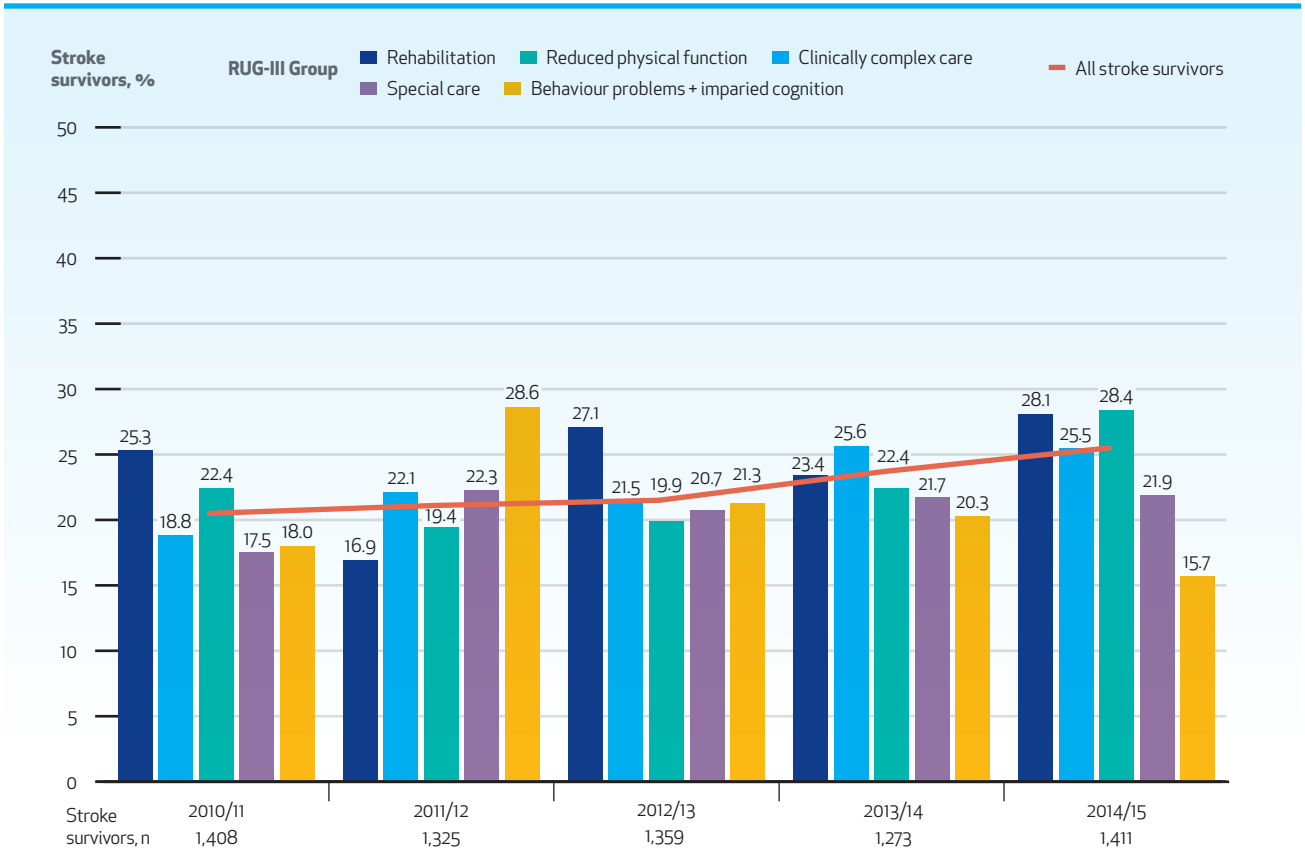
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] A fall is defined as any unintentional change in position where the resident ends up on the floor, ground or other lower level; includes falls with or without injury.[23]

[2] Only falls experienced and reported in the 30 days before the full assessment date were captured; therefore, a fall may have occurred prior to admission to complex continuing care or long-term care.

EXHIBIT 10.2B Proportion of stroke survivors in long-term care who had a fall in the 30 days prior to a full RAI-MDS 2.0 assessment,[1,2] by RUG-III group, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] A fall is defined as any unintentional change in position where the resident ends up on the floor, ground or other lower level; includes falls with or without injury.[23]

[2] Only falls experienced and reported in the 30 days before the full assessment date were captured; therefore, a fall may have occurred prior to admission to complex continuing care or long-term care.

LONG-TERM CARE EXPERIENCE

A 73-year-old man was admitted to our long-term care home following a stroke. The stroke significantly impaired his vision, and he has experienced numerous falls as a result. Prior to his admission, his wife helped him with eating, as his vision loss had left him unable to guide food to his mouth. He struggles with the grief that typically accompanies a stroke event. His goal is to return home, and he is working toward getting his independence back.

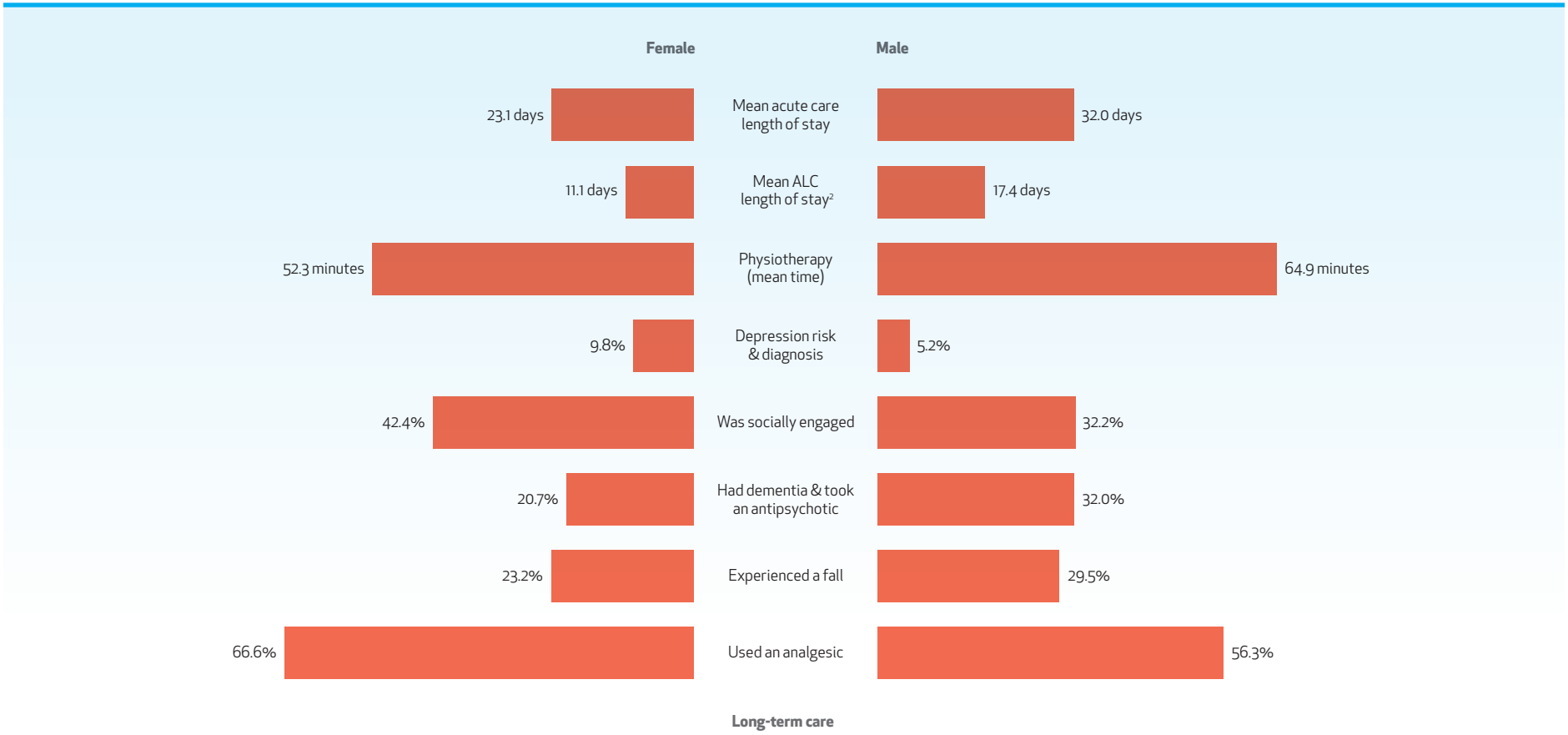
Using stroke best practices, this resident's care team has:

- Implemented a nursing restorative approach to assist with increasing his independence in eating. The resident is now able to eat with limited assistance.
- Assisted with navigation within the home by helping the resident to learn pathways by contrasting light and dark. The resident can now locate the dining room independently and is beginning to recognize the voices of various staff members.
- Made a referral to CNIB to access available visual resources and to provide staff education regarding vision loss.
- Learned about the resident's past to engage him in meaningful conversations and activities by using audio books and music to spark his interest.
- Implemented strategies to maintain the resident's mobility and prevent falls so he is able to leave the home and enjoy time with his wife.
- Supported staff learning through the display of stroke education posters based on the *Taking Action for Optimal Community and Long-Term Stroke Care* resource.

– Director of Care, Long-Term Care Facility

Gender and Location

EXHIBIT 11.1 Statistically significant differences[1] in stroke care best practice between female and male stroke survivors in long-term care, in Ontario, 2014/15



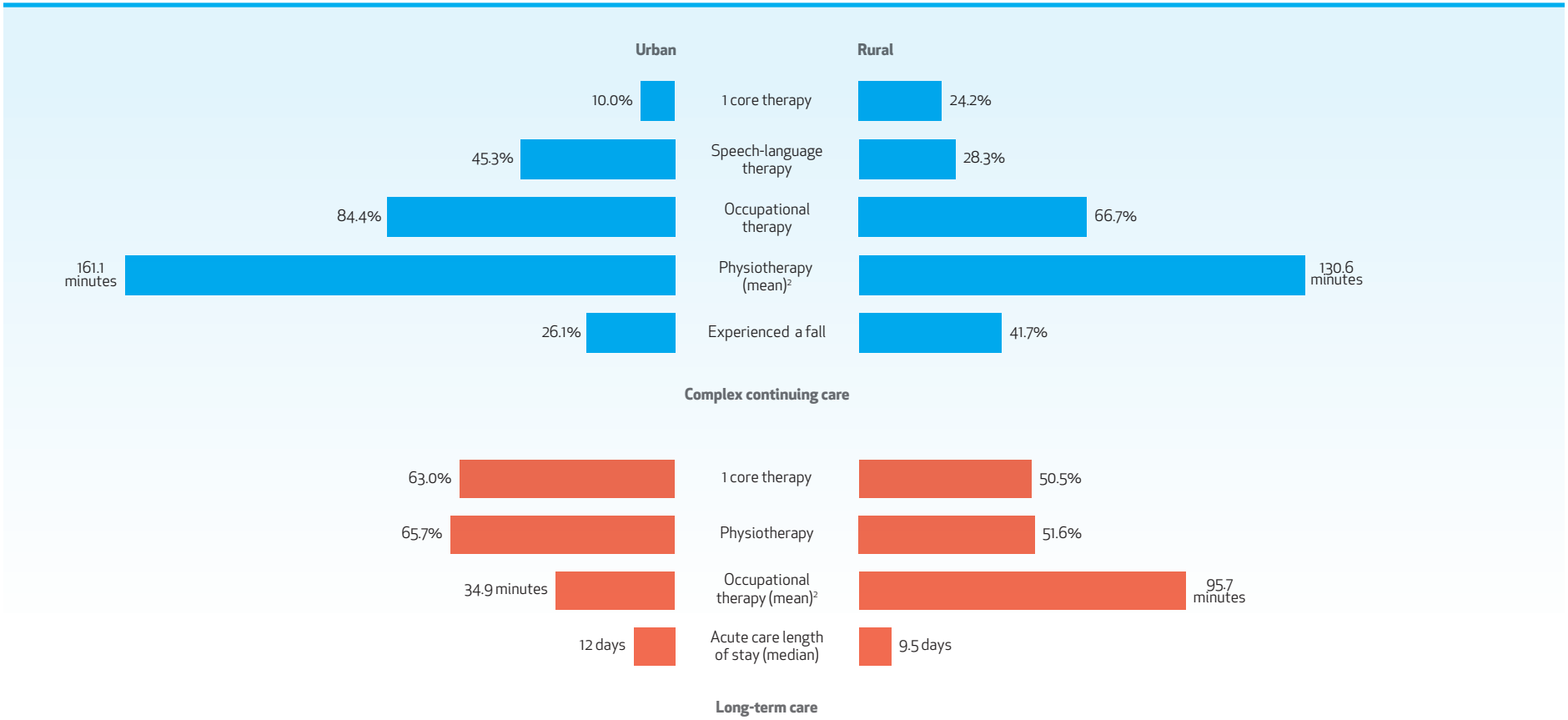
Data sources: CIHI–DAD, 2014/15; CCRS–LTC, 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care, and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Significance was determined if the p-value associated with the comparison was < 0.01

[2] A patient is designated alternate level of care (ALC) by a physician or his/her delegate when the patient is occupying a hospital bed in an acute care, complex continuing care, mental health or rehabilitation setting and does not require the intensity of resources or services provided. The ALC wait period begins at the time of designation and ends at the time of patient discharge or transfer to a discharge destination (or when the patient's condition changes and the ALC designation no longer applies). The standardized ALC definition was implemented in all acute care facilities in Ontario on July 1, 2009.

EXHIBIT 11.2 Statistically significant differences[1] in stroke care best practice between urban and rural stroke survivors in complex continuing care and long-term care, in Ontario, 2014/15



Data sources: CIHI–DAD, 2014/15; CCRS–CCC and CCRS–LTC, 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Significance was determined if the p-value associated with the comparison was < 0.01
[2] The mean number of minutes of therapy in a 7-day period.

FINDINGS – STROKE BEST PRACTICE CARE

Exhibit 5.1

All stroke survivors are assessed for symptoms of depression upon admission to complex continuing care or long-term care. Between 2010/11 and 2014/15, the proportion of stroke survivors in complex continuing care who had a diagnosis of depression increased slightly from 4.9% to 5.4%. The proportion of stroke survivors in complex continuing care with a score of 3 or higher on the Depression Rating Scale (indicating major or minor depressive symptoms) increased from 14.9% in 2010/11 to 18.3% in 2014/15. There was little change over the study period in the overall proportion of stroke survivors with a similar score admitted to long-term care within six months of an acute stroke or transient ischemic attack.

Exhibit 6.1

All stroke survivors are screened for cognitive impairment. Between 2010/11 and 2014/15, the proportion of stroke survivors in complex continuing care who were considered to have severe cognitive impairment, as indicated by a Cognitive Performance Scale score of 4 to 6, increased from 25.6% to 28.6%. Conversely, the proportion of stroke survivors in long-term care considered to have severe cognitive impairment decreased from 25.2% in 2010/11 to 20.3% in 2014/15. In each of the five years studied, the complex continuing care setting had a higher proportion of stroke survivors with severe cognitive impairment compared to the long-term care setting.

Exhibit 7.1

In both the complex continuing care and long-term care settings, less than half of stroke survivors with mild to no cognitive impairment were considered to be socially engaged. Among the cohort of stroke survivors in complex continuing care who had both a full assessment and a quarterly assessment at 90 days, there was a modest increase in the proportion of survivors considered to be socially engaged at the quarterly assessment, in 2014/15 half (49.7%) of the stroke survivors were considered to be socially engaged and by the 90-day assessment over half (56.0%) were considered to be engaged. A similar pattern was observed among the cohort of stroke survivors in long-term care, with only 35.5% considered to be socially engaged at the full assessment and 45.2% at the 90-day quarterly assessment.

Exhibits 8.1a,b and 8.2a,b

Pain management helps to ensure that stroke survivors can participate in activities of daily living, rehabilitation therapy and social activities and contributes to an improved quality of life. Pain is initially assessed during admission to complex continuing care or long-term care following the acute stroke and reassessed at 90 days. Each year close to 30% of stroke survivors in complex continuing care reported daily pain that was either moderate or severe (indicated by a Pain Scale score of 2 or 3, respectively), that is reported to be unrelieved by treatment(s), as observed by facility staff compared to less than 20% of stroke survivors in long-term care. In 2014/15, 64.5% of stroke survivors in complex continuing care and 62.8% in long-term care received pain medication in the 7 days prior to their admission assessment. Less than 40% of stroke survivors in complex continuing care and close to half (47.7%) of stroke survivors in long-term care who had a pain score of 0 were taking analgesics.

Exhibits 8.3a,b

Among the cohort of stroke survivors who had full and 90-day quarterly RAI-MDS 2.0 assessments in 2014/15, the proportion assessed to have daily pain that was either moderate or severe (indicated by a Pain Scale score of 2 or 3) and unrelieved by treatment, as observed by facility staff, decreased from 29.1% to 23.0% in the CCC setting and from 10.9% to 10.0% in the LTC setting.

Exhibit 9.1

Atrial fibrillation is considered a key risk factor for stroke, and most stroke survivors with the condition require appropriate anticoagulation medication. Among stroke survivors with atrial fibrillation who were admitted to complex continuing care and discharged home in 2014/15, less than half (48.0%) filled a prescription for anticoagulation medication within 90 days of their discharge. That year, 63.7% of stroke survivors in long-term care had a prescription for an anticoagulant filled within 90 days after discharge from acute care for an acute stroke event.

Exhibits 9.2a,b

In 2014/15 one third (32.8%) of stroke survivors in complex continuing care and almost half (47.4%) of stroke survivors in long-term care received an antidepressant in the 7 days prior to their full assessment. The use of antidepressants in long-term care increased from 43.3% in 2010/11 to 47.4% in 2014/15, while in complex continuing care, the use of antidepressants remained stable over the 5 years. In complex continuing care, 16.0% of stroke survivors received an antipsychotic, 13.0% received an antianxiety medication and 17.1% received a hypnotic (i.e., a sleeping aid). The prevalence of key medication use was generally lower among stroke survivors in long-term care: 19.1% received antipsychotic medication, 9.9% received antianxiety medication and 6.9% received a hypnotic.

Exhibit 9.3a

Between 2010/11 and 2014/15, the proportion of stroke survivors with a diagnosis of dementia who received antipsychotic medication increased from 27.0% to 34.6% in complex continuing care and decreased from 38.5% to 24.5% in long-term care. In both settings, antipsychotic medication use among stroke survivors without a diagnosis of dementia remained stable over the years. In 2014/15, 12.4% of stroke survivors without a diagnosis of dementia in complex continuing care and 15.7% of those in long-term care received antipsychotic medications.

Exhibit 9.3b,c

In 2014/15, among the cohort of stroke survivors who had full and 90-day quarterly RAI-MDS 2.0 assessments, the proportion of survivors in complex continuing care without a diagnosis of dementia who received antipsychotic medication increased from the full assessment compared to the 90-day quarterly assessment, from 16.2% vs 19.2%. Conversely in the long-term care setting, the proportion of stroke survivors without a diagnosis of dementia who received antipsychotic medication decreased from 17.1% at the full assessment to 13.6% at the 90-day quarterly assessment.

Exhibits 10.1 and 10.2a,b

At the time of admission to complex continuing care or long-term care, the number of falls in the previous 30 days is recorded as part of the full assessment; this information can alert care providers to the need for measures to prevent further falls. Falls experienced and reported in the 30 days prior to the full assessment date are captured by this indicator; therefore, the fall(s) captured in the full assessment may have occurred prior to admission. In general, the proportion of stroke survivors in complex continuing care and long-term care who experienced a fall in the 30 days prior to their full assessment increased between 2010/11 and 2014/15: from 25.4% to 27.8% for complex continuing care and from 20.5% to 25.5% for long-term care. Among the cohort of stroke survivors who had full and 90-day quarterly assessments, the rate of falls decreased in both complex continuing care and long-term care settings (from 24.9% and 24.8% at the full assessment to 14.9% and 19.5%, respectively).

Exhibit 11.1

Female stroke survivors in long-term care were almost twice as likely to be at risk for or have a diagnosis of depression compared to their male counterparts (9.8% vs. 5.2%). Women were less likely than men to experience falls (23.2% vs. 29.5%).

Exhibit 11.2

Compared to their urban counterparts, rural stroke survivors in complex continuing care in 2014/15 were less likely to receive occupational therapy (84.4% vs. 66.7%) and speech-language therapy (45.3% vs. 28.3%), and more likely to experience falls (26.1% vs. 41.7%). Similarly in long-term care, rural stroke survivors were less likely to receive physiotherapy than their urban counterparts (51.6% vs. 65.7%).

HIGHLIGHTS

- Between 2010/11 and 2014/15, the proportion of stroke survivors diagnosed with depression increased from 4.9% to 5.4% in complex continuing care and from 8.0% to 8.1% in long-term care. In the same period, the proportion of stroke survivors considered at risk for depression (having a score of 3 or higher on the Depression Rating Scale) increased from 14.9% to 18.3% in complex continuing care and decreased from 24.9% to 23.8% in long-term care.
- The proportion of stroke survivors in complex continuing care with severe cognitive impairment (a score of 4–6 on the Cognitive Performance Scale) increased from 25.6% in 2010/11 to 28.6% in 2014/15. The proportion of stroke survivors in long-term care with severe cognitive impairment decreased from 25.2% in 2010/11 to 20.3% in 2014/15.
- In both the complex continuing care and long-term care settings, upon full assessment less than half of stroke survivors with mild to no cognitive impairment were considered to be socially engaged. Among the cohort of survivors who had a 90-day quarterly assessment, the level of social engagement had improved minimally for survivors in complex continuing care and modestly among those in long-term care.
- Close to 30% of stroke survivors in complex continuing care and almost 20% in long-term care reported having pain on a daily that was unrelieved by treatment, as observed by facility staff.
- Less than half (48.0%) of stroke survivors with atrial fibrillation who were admitted to complex continuing care and discharged home had a prescription filled for anticoagulant medication within 90 days of their discharge.
- More than 60% of stroke survivors with atrial fibrillation in long-term care had their anticoagulation prescription filled by the facility within 90 days of their acute stroke.
- Between 2010/11 and 2014/15, the proportion of stroke survivors in complex continuing care who experienced a fall in the 30 days prior to their full assessment increased from 25.4% to 27.8%; among their counterparts in long-term care, the proportion increased from 20.5% to 25.5%.

Survivor Outcomes

EXHIBIT 12.1 Health-related quality of life for stroke survivors in complex continuing care and long-term care, by Minimum Data Set Health Status Index (MDS-HSI) mean score,[1] in Ontario, 2010/11 to 2014/15

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] The Health-Related Quality of Life Scale ranges from -0.020 to 1.000, where less than 0 reflects a state worse than death, 0 represents the worst possible health state (i.e., dead) and 1 represents the best possible health state that one could expect to achieve.

EXHIBIT 13.1A Discharge destination of stroke survivors in complex continuing care, in Ontario, 2010/11 to 2014/15

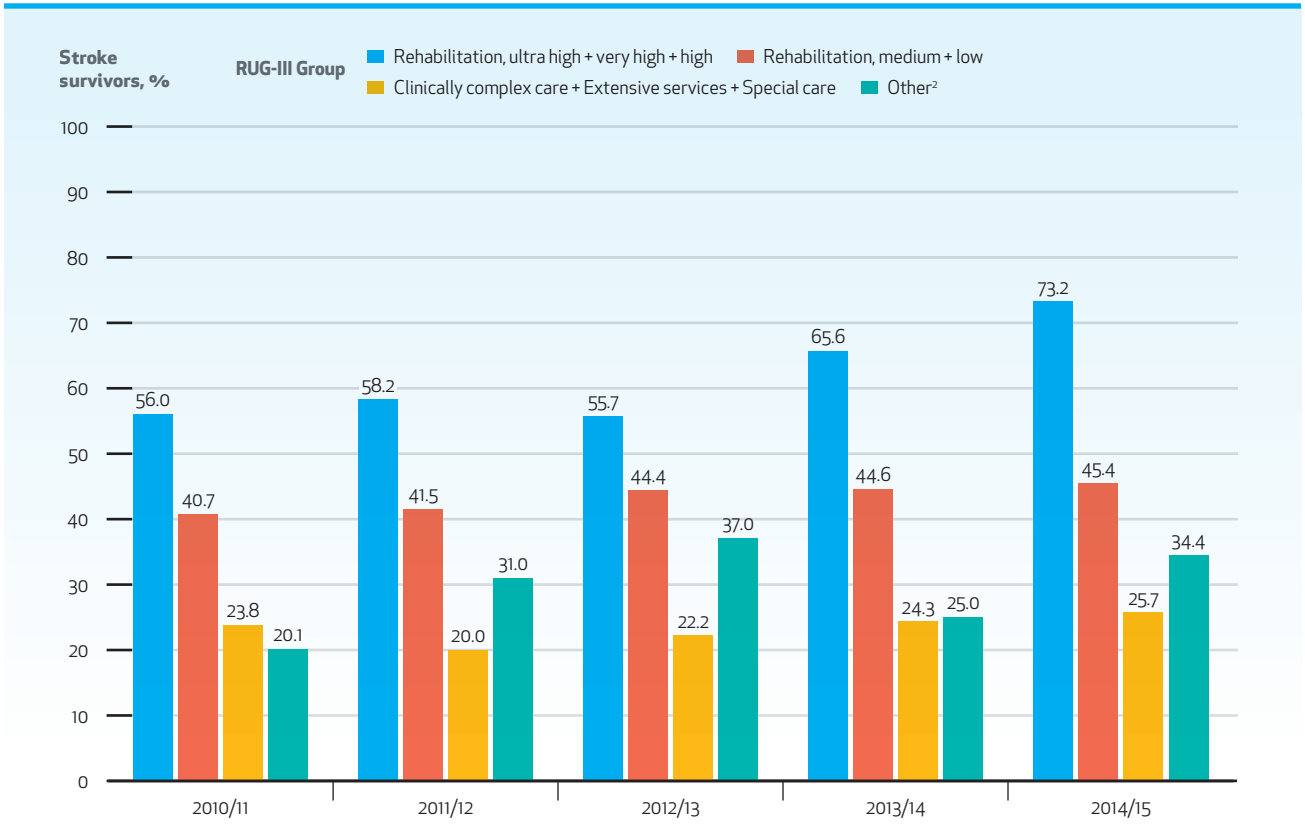
	Year				
Discharge Destination, n (%)	**2010/11**	**2011/12**	**2012/13**	**2013/14**	**2014/15**
All stroke survivors, N	1,302	1,273	1,202	1,139	1,085
Independent/semi-independent living	492 (37.8)	485 (38.1)	490 (40.8)	488 (42.8)	496 (45.7)
Home care service	298 (22.9)	290 (22.8)	263 (21.9)	267 (23.4)	257 (23.7)
Private home (no home care)	129 (9.9)	129 (10.1)	153 (12.7)	141 (12.4)	177 (16.3)
Residential care service (Retirement home/assisted living)	65 (5.0)	66 (5.2)	74 (6.2)	80 (7.0)	62 (5.7)
Residential care service (24-hour nursing) [Long-term care]	305 (23.4)	296 (23.3)	260 (21.6)	219 (19.2)	185 (17.1)
Inpatient acute care service	210 (16.1)	185 (14.5)	166 (13.8)	161 (14.1)	127 (11.7)
Deceased	116 (8.9)	120 (9.4)	124 (10.3)	122 (10.7)	114 (10.5)
Other[1]	155 (11.9)	166 (13.0)	145 (12.1)	134 (11.8)	148 (13.6)
Inpatient continuing care service	24 (1.8)	21 (1.6)	17 (1.4)	15 (1.3)	15 (1.4)

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Other includes inpatient psychiatric, inpatient rehabilitation, other/unclassified, ambulatory discharge destinations and missing.

EXHIBIT 13.1B Proportion of stroke survivors discharged to independent/semi-independent living[1] arrangements from complex continuing care, by RUG-III group, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Independent/semi-independent living includes private home with home care service, private home without home care service, and residential care service (retirement home/assisted living) discharge destinations.

[2] Other categories include reduced physical function, impaired cognition and behaviour problems.

EXHIBIT 13.2A Final discharge destination of stroke survivors admitted to complex continuing care, by journey, in Ontario, 2010/11 to 2014/15

Characterisics, n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All stroke survivors, N	1,302	1,273	1,202	1,139	1,085
Journey 1: Inpatient acute care → Complex continuing care					
Stroke survivors	906 (69.6)	876 (68.8)	777 (64.6)	733 (64.4)	636 (58.6)
Independent/semi-independent living[1]	369 (40.7)	371 (42.4)	346 (44.5)	345 (47.1)	308 (48.4)
Long-term care	224 (24.7)	217 (24.8)	165 (21.2)	138 (18.8)	114 (17.9)
Other[2]	220 (24.3)	190 (21.7)	158 (20.3)	160 (21.8)	133 (20.9)
Death	93 (10.3)	98 (11.2)	108 (13.9)	90 (12.3)	81 (12.7)
Journey 2: Inpatient acute care → Inpatient rehabilitation → Complex continuing care					
Stroke survivors	275 (21.1)	260 (20.4)	300 (25.0)	298 (26.2)	353 (32.5)
Independent/semi-independent living[1]	121 (44.0)	114 (43.8)	143 (47.7)	141 (47.3)	185 (52.4)
Long-term care	80 (29.1)	79 (30.4)	94 (31.3)	79 (26.5)	70 (19.8)
Other[2]	51 (18.5)	45 (17.3)	47 (15.7)	46 (15.4)	65 (18.4)
Death	23 (8.4)	22 (8.5)	16 (5.3)	32 (10.7)	33 (9.3)
Journey 3: Inpatient acute care → Complex continuing care → Inpatient rehabiliation					
Stroke survivors	110 (8.4)	127 (10.0)	116 (9.7)	95 (8.3)	80 (7.4)
Independent/semi-independent living[1]	67 (60.9)	87 (68.5)	75 (64.7)	52 (54.7)	43 (53.8)
Long-term care	25 (22.7)	15 (11.8)	15 (12.9)	13 (13.7)	11 (13.8)
Other[2]	18 (16.4)	25 (19.7)	26 (22.4)	30 (31.6)	26 (32.5)
Journey 4: Inpatient acute care → Inpatient rehabilitation → Complex continuing care → Inpatient rehabilitation					
Stroke survivors	11 (0.8)	10 (0.8)	9 (0.7)	13 (1.1)	16 (1.5)
Independent/semi-independent living[1]	7 (63.6)	8 (80.0)	7 (77.8)	≤5	9 (56.3)
Long-term care	≤5	≤5	≤5	6 (46.1)	≤5
Other[2]	≤5	≤5	≤5	≤5	≤5

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Independent/semi-independent living includes home care service, private home (no home care) and residential care service (retirement home/assisted living) discharge destinations.

[2] Other includes inpatient psychiatric, inpatient rehabilitation (for journeys 3 and 4), other/unclassified, ambulatory discharge destinations and missing.

Note: Journey refers to care transitions following an inpatient acute stroke or TIA for stroke survivors who were admitted to complex continuing care within 6 months of the acute stroke or TIA.

EXHIBIT 13.2B Final discharge destination of stroke survivors admitted to long-term care, by journey, in Ontario, 2010/11 to 2014/15

Characterisics, n (%)	Year				
	2010/11	2011/12	2012/13	2013/14	2014/15
All stroke survivors, N	1,408	1,325	1,359	1,273	1,411
Journey 1: Inpatient acute care → Long-term care					
Stroke survivors	864 (61.4)	780 (58.9)	845 (62.2)	745 (58.5)	810 (57.4)
Independent/semi-independent living[1]	46 (5.3)	35 (4.5)	43 (5.1)	40 (5.4)	46 (5.7)
Death	264 (30.6)	238 (30.5)	185 (21.9)	185 (24.8)	152 (18.8)
Other[2]	409 (47.3)	361 (46.3)	364 (43.1)	307 (41.2)	274 (33.8)
Remained in long-term care	145 (16.8)	146 (18.7)	201 (23.8)	213 (28.6)	338 (41.7)
Journey 2: Inpatient acute care → Inpatient rehabilitation → Long-term care					
Stroke survivors	221 (15.7)	246 (18.6)	245 (18.0)	289 (22.7)	347 (24.6)
Independent/semi-independent living[1]	42 (19.0)	41 (16.7)	49 (20.0)	55 (19.0)	73 (21.0)
Death	31 (14.0)	34 (13.8)	38 (15.5)	45 (15.6)	40 (11.5)
Other[2]	94 (42.5)	96 (39.0)	74 (30.2)	98 (33.9)	81 (23.3)
Remained in long-term care	54 (24.4)	75 (30.5)	84 (34.3)	91 (31.5)	153 (44.1)
Journey 3: Inpatient acute care → Complex continuing care → Long-term care					
Stroke survivors	226 (16.1)	213 (16.1)	174 (12.8)	146 (11.5)	137 (9.7)
Independent/semi-independent living[1]	15 (6.6)	20 (9.4)	15 (8.6)	15 (10.3)	10 (7.3)
Death	62 (27.4)	51 (23.9)	41 (23.6)	22 (15.1)	27 (19.7)
Other[2]	83 (36.7)	88 (41.3)	61 (35.1)	54 (37.0)	36 (26.3)
Remained in long-term care	66 (29.2)	54 (25.4)	57 (32.8)	55 (37.7)	64 (46.7)
Journey 4: Inpatient acute care → Inpatient rehabilitation → Complex continuing care → Long-term care					
Stroke survivors	82 (5.8)	75 (5.7)	79 (5.8)	79 (6.2)	103 (7.3)
Independent/semi-independent living[1]	15 (18.3)	8 (10.7)	19 (24.1)	9 (11.4)	17 (16.5)
Death	12 (14.6)	11 (14.7)	10 (12.7)	10 (12.7)	8 (7.8)
Other[2]	36 (43.9)	33 (44.0)	34 (43.0)	23 (29.1)	36 (35.0)
Remained in long-term care	19 (23.2)	23 (30.7)	16 (20.3)	37 (46.8)	42 (40.8)
Journey 5: Inpatient acute care → Complex continuing care → Inpatient rehabilitation → Long-term care					
Stroke survivors	15 (1.1)	11 (0.8)	16 (1.2)	14 (1.1)	14 (1.0)
Independent/semi-independent living[1]	≤5	≤5	≤5	≤5	6 (42.9)
Death	≤5	≤5	≤5	≤5	≤5
Other[2]	6 (40.0)	≤5	≤5	≤5	≤5
Remained in long-term care	6 (40.0)	≤5	7 (43.8)	≤5	≤5

Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

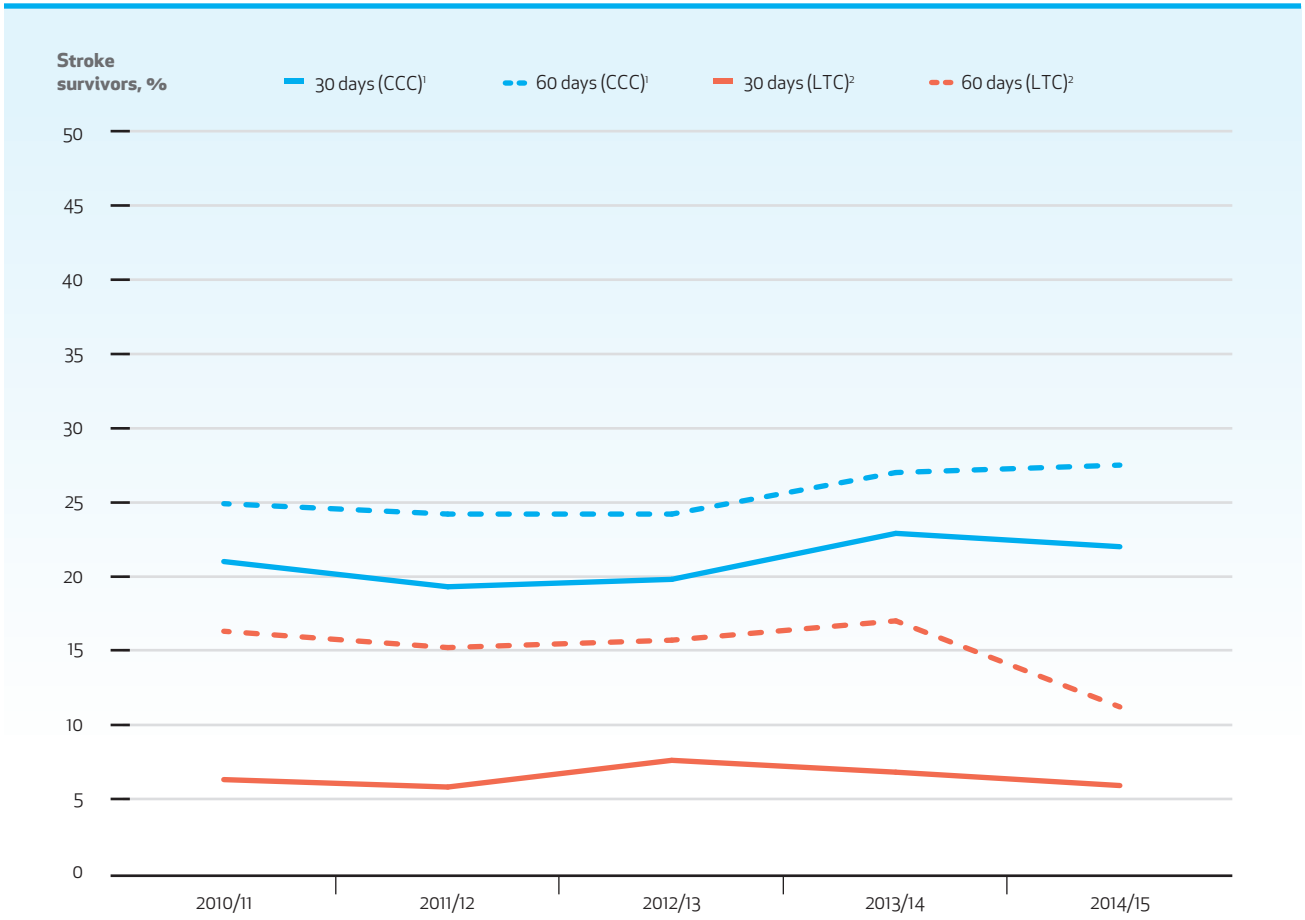
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Independent/semi-independent living includes home care service, private home without home care, and residential care service (retirement home/assisted living).

[2] Other includes inpatient psychiatric, inpatient rehabilitation, other/unclassified, ambulatory discharge destinations and missing.

Note: Journey refers to the care transitions following an inpatient acute stroke/TIA for stroke survivors who were admitted to long-term care within 6 months of the acute stroke/TIA.

EXHIBIT 14.1 Proportion of stroke survivors in complex continuing care and long-term care who were readmitted to acute care within 30 and 60 days, in Ontario, 2010/11 to 2014/15



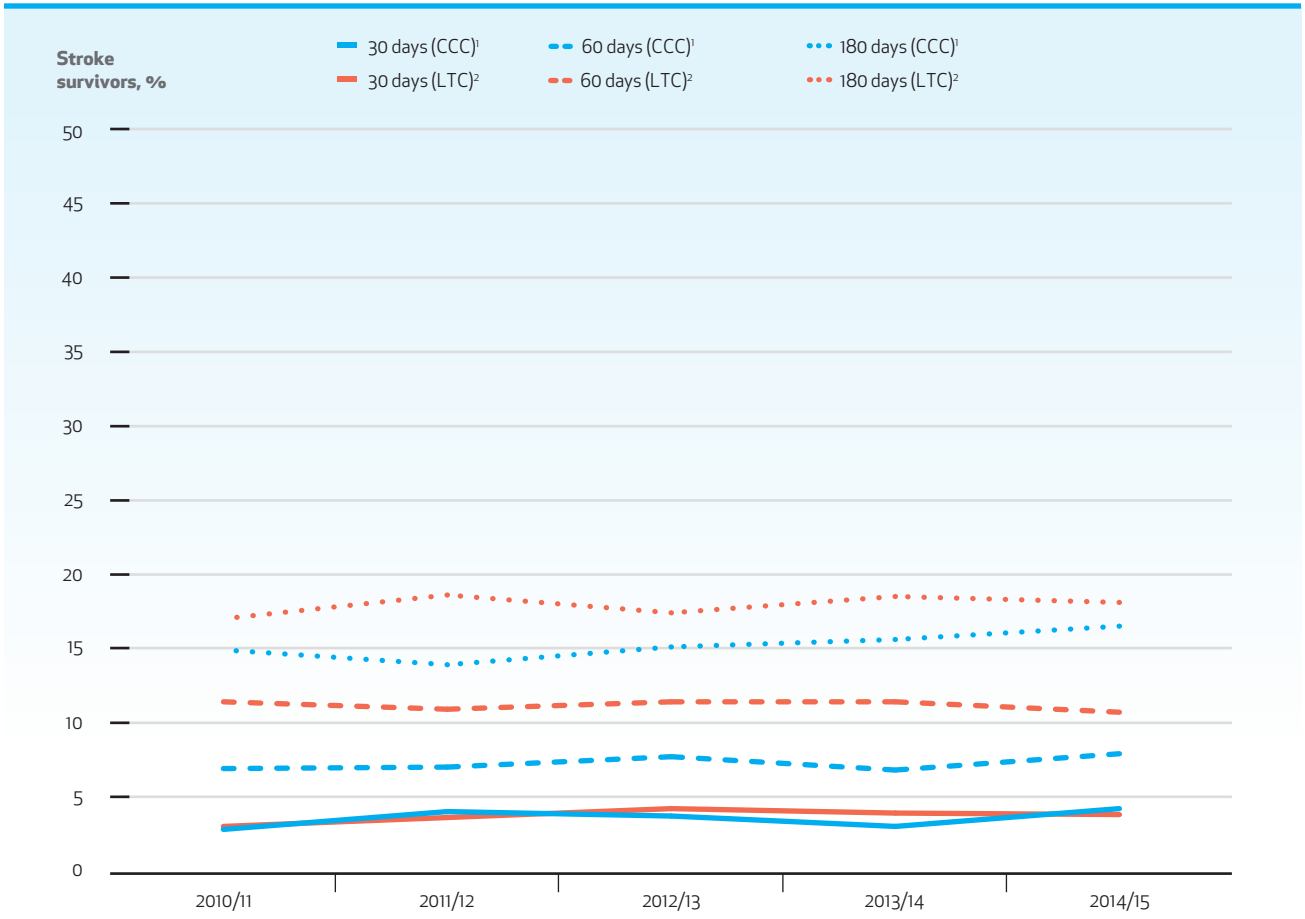
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Within 30 and 60 days of the complex continuing care discharge date.

[2] Within 30 and 60 days of the full assessment poststroke or TIA in long-term care.

EXHIBIT 15.1 Crude mortality rate of stroke survivors in complex continuing care and long-term care at 30, 60 and 180 days, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC and CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS database within 6 months of discharge from acute care and had a length of stay in complex continuing care or long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Unadjusted mortality within 30, 60 and 180 days of admission to complex continuing care.

[2] Unadjusted mortality within 30, 60 and 180 days of a full assessment in long-term care following a stroke or TIA.

FINDINGS – SURVIVOR OUTCOMES

Exhibit 12.1

For stroke survivors in complex continuing care and long-term care in 2014/15, scores on the Minimum Data Set Health Status Index were low at 0.32 and 0.37, respectively; similar scores were observed in previous years.

Exhibit 13.1a

Among stroke survivors in complex continuing care, the proportion discharged to independent or semi-independent living rose from 37.8% in 2010/11 to 45.7% in 2014/15, while the proportion discharged to long-term care dropped from 23.4% in 2010/11 to 17.1% in 2014/15.

Exhibit 13.1b

Among stroke survivors who were discharged from complex continuing care to independent or semi-independent living between 2010/11 and 2014/15, the proportion whose rehabilitation resource use was characterized as ultra high, very high or high in the RUG-III special rehabilitation category increased from 56.0% to 73.2%, and the proportion whose use was medium or low increased from 40.7% to 45.4%.

Exhibit 13.2a

The proportion of stroke survivors who were admitted to inpatient rehabilitation prior to their admission to complex continuing care and were subsequently discharged to semi-independent living (journey 2) increased from 44.0% in 2010/11 to 52.4% in 2014/15. Journey 2 (admitted to inpatient rehabilitation prior to complex continuing care) had a larger decrease in the proportion of survivors discharged to long-term care, from 29.1% in 2010/11 to 19.8% in 2014/15 compared to stroke survivors admitted directly to complex continuing care (24.7% in 2010/11 to 17.9% in 2014/15).

Exhibit 13.2b

Very few stroke survivors in long-term care were discharged to independent or semi-independent settings. However, survivors admitted to inpatient rehabilitation prior to their admission to long-term care (journey 2) had an increase in discharges to independent or semi-independent settings; from 19.0% in 2010/11 to 21.0% in 2014/15.

Exhibit 14.1

About 20% of stroke survivors in complex continuing care and 6% of those in long-term care were readmitted to acute care within 30 days. Between 2010/11 and 2014/15, readmission to acute care within 60 days of discharge from complex continuing care increased from 24.9% to 27.5%. In that same period, readmission to acute care within 60 days of the full assessment after an acute stroke in long-term care decreased from 16.3% to 11.2%.

Exhibit 15.1

Stroke survivors in complex continuing care and long-term care had similar crude mortality rates at 30 days. The crude mortality rate at 60 days and 180 days was 2%–3% higher for those in long-term care.

HIGHLIGHTS

- In 2014/15, the health-related quality of life of stroke survivors on admission to complex continuing care and long-term care was classified as low, with Health Status Index mean scores of 0.32 and 0.37, respectively.

- Between 2010/11 and 2014/15, the proportion of stroke survivors who were discharged from complex continuing care to independent or semi-independent living increased from 37.8% to 45.7%.

- In 2014/15, 52.4% of stroke survivors who had been admitted to inpatient rehabilitation prior to complex continuing care (journey 2) were discharged to independent or semi-independent settings, compared to 48.4% of stroke survivors who were admitted directly to complex continuing care from acute care (journey 1).

Discussion

Stroke Survivor Characteristics, Clinical Health Status and Best Practice Care

This descriptive report reveals that stroke survivors admitted to CCC and LTC are the oldest cohort among the various poststroke trajectories.[9] The median age of stroke survivors in CCC is 78 years, and in LTC, it is 84 years; the median age of stroke survivors entering inpatient rehabilitation following an acute stroke event is 72 years.[11]

Many stroke survivors admitted to CCC or LTC following an acute stroke have comorbidities, including atrial fibrillation, depression and dementia; limitations in their ability to communicate; incontinence; and daily pain. Almost all require extensive assistance with activities of daily living. Many are considered to exhibit a low degree of social engagement and have low HRQL.

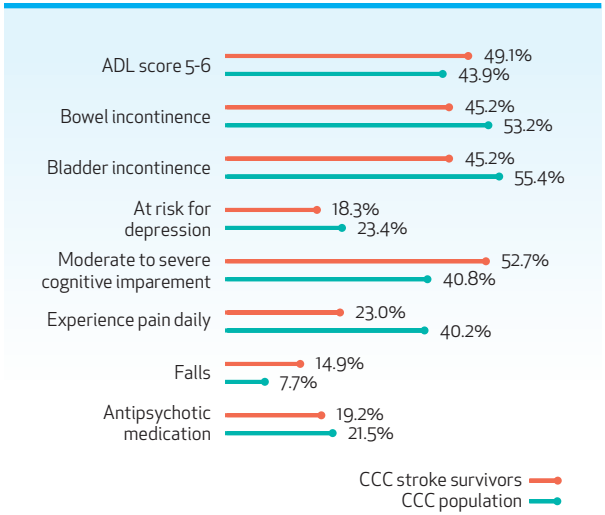
The Canadian Stroke Best Practice Recommendations advise assessment or screening for dysphagia, fall risk, cognitive impairment, depression, pain and identification of rehabilitation needs at each transition point in care.[20] In CCC and LTC, the RAI-MDS 2.0 is the standardized tool that covers these assessments or screenings; it is completed within 14 days of admission, as well as quarterly, annually and when there is a significant change in health status.* The assessment tool uses a 7-day look-back period to identify care needs and service.

Compared to the general CCC population, stroke survivors in 2014/15[17]:

- were more likely to require higher levels of assistance with activities of daily living (an ADL Hierarchy Scale score of 5–6)

*Significant change is defined in RAI-MDS 2.0 as a major change in a resident's health status that is not self-limiting, impacts more than one area of the resident's health status, and requires interdisciplinary review and/or revision of the resident's care plan.

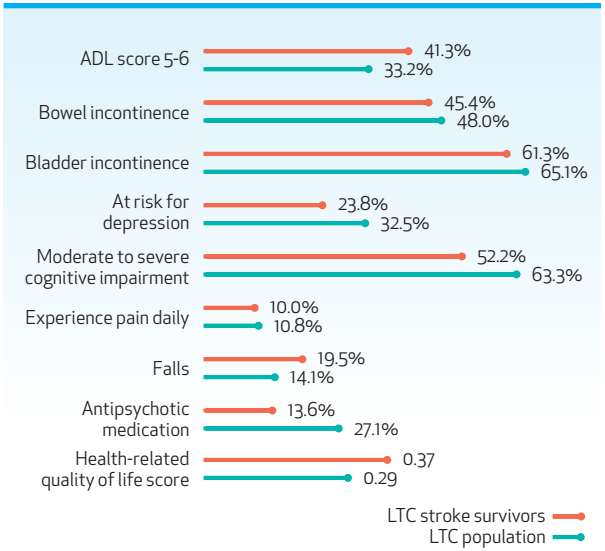
- were less likely to be continent in bowel and bladder
- were less likely to be identified as being at risk for depression
- were more likely to have moderate to severe cognitive impairment
- were less likely to experience daily pain
- were more likely to have experienced a fall
- were less likely to receive antipsychotic medication without a diagnosis of dementia.



Compared to the general LTC population, stroke survivors in 2014/15[17]*:

- were more likely to require higher levels of assistance with activities of daily living (an ADL Hierarchy Scale score of 5–6)
- were less likely to have some level of bowel and bladder incontinence
- were less likely to be identified as being at risk for depression
- were less likely to have moderate to severe cognitive impairment
- were less likely to experience daily pain
- were more likely to have experienced a fall
- were less likely to receive antipsychotic medication without a diagnosis of dementia, compared to the general LTC population without dementia
- had a higher HRQL score (0.37 vs. 0.29).[29]

The lower level of depressive symptoms among stroke survivors is noteworthy; it may suggest an awareness of poststroke depression and earlier initiation of treatment. Secondary prevention to prevent another stroke or TIA is a key best practice, especially for those with atrial fibrillation.[30] Stroke



survivors with atrial fibrillation in CCC are less likely to fill anticoagulant medications within 90 days of discharge compared to stroke patients discharged from acute care (48.0% and 72.6%, respectively, in 2014/15).[2] Stroke survivors with atrial fibrillation in LTC are more likely to receive anticoagulant medication within 90 days of the full RAI-MDS 2.0 assessment compared to stroke survivors discharged from CCC (63.7% and 48.0%, respectively). The low prescription fill rate among stroke survivors with atrial fibrillation discharged from CCC is concerning given the risk of recurrent stroke which, while highest in the first 7 days of the event, continues for 5 years for survivors of stroke or TIA without early complications.[31] Screening for dysphagia with a validated tool is a Canadian Stroke Best Practice Recommendation; however, it is not

* The calculation of the indicators in this report and in the CCRS Quick Stats varies slightly due to differences in record inclusion/exclusion criteria, time of report runs, and more. The CCRS Quick Stats indictors are presented as a percentage for a fiscal year and derived, based on the coding of the RAI-MDS 2.0 assessment, which is a point-in-time assessment.

known if a validated dysphagia screening tool/scale is used in these settings beyond the RAI-MDS 2.0 assessment of swallowing or chewing problems.

In accordance with the Canadian Stroke Best Practice Recommendations, stroke survivors should be screened for fall risk at all transition points, and if risk is identified, fall prevention strategies should be implemented.[7,32] Patient falls is a key quality indicator.[17] The 2014/15 data from the 90-day RAI-MDS 2.0 quarterly assessments indicate that the proportion of stroke survivors who experienced a fall in the 30-day look-back period was much higher than for the general resident population in both CCC (14.9% and 7.7%, respectively) and LTC (19.5% and 14.1%, respectively). This suggests that stroke survivors as a high-risk population require targeted and effective fall prevention strategies.

Antipsychotic medication use is a key quality indicator, given the negative consequences associated with its use.[33] Although data from the 90-day RAI-MDS 2.0 quarterly assessments indicate that the proportion of stroke survivors without dementia who were prescribed antipsychotics is lower compared to the general CCC and LTC populations, the rising proportion of stroke survivors without dementia in CCC receiving antipsychotic medications over the study period from 12.6% in 2010/11 to 19.2% in 2014/15 ($p \geq 0.05$) is concerning. From 2010/11 to 2015/16, the antipsychotic prescribing rate among stroke survivors in LTC remained stable at just under 20%, while national rates fell from 35% to 23%.[34]

In accordance with Canadian Stroke Best Practice Recommendations, stroke survivors should have an up-to-date, patient-centred care plan that addresses ongoing medical, functional, rehabilitation, communication and psychosocial needs and goals.[32] Care plans are developed for all stroke survivors in CCC and LTC based on items triggered as an output of the RAI-MDS 2.0 assessment process. As such, CCC and LTC staff should also consider resources such as Taking Action for Optimal Community and Long Term Stroke Care, which provides best-practice information to guide the care of stroke survivors in LTC and CCC settings,[5] and the 12 Stroke Care Plans for Long-Term Care, which provide a best-practice foundation for care planning in several areas of care, including those identified in this report (depression, pain, mobility, cognition and incontinence).[6] These resources support staff in caring for an increasingly older stroke population with complex needs.

Stroke rehabilitation improves independence, reduces hospitalization, saves lives and should be considered the standard of care for all stroke survivors.[11] The Canadian Stroke Best Practice Recommendations state that inpatient rehabilitation should be provided on a specialized stroke rehabilitation unit, and that survivors of moderate to severe stroke should be given an opportunity to participate in inpatient rehabilitation when ready and have assessments at regular intervals to determine access to inpatient or outpatient rehabilitation.[7] The Recommendations also state that stroke survivors in LTC with ongoing rehabilitation goals should have access to specialized stroke services in either inpatient or outpatient setting.[32] It is encouraging to see an increase in the proportion of stroke survivors discharged to inpatient rehabilitation before admission to CCC and LTC between 2010/11 and 2014/15: from 29.1% to 34.0% among those admitted to CCC and from 15.7% to 24.6% among those admitted to LTC. However, we do not know if rehabilitation needs are being reassessed after admission to CCC, given that most stroke survivors are discharged before the quarterly 90-day assessment is done. The low numbers of stroke survivors transferred to inpatient rehabilitation from CCC and LTC suggest that reassessment is either not occurring, or is occurring but admission criteria are not being met or inpatient rehabilitation programs are not accessible to those in CCC or LTC.

Although the majority of stroke survivors admitted to CCC are classified to the special rehabilitation RUG-III group, the amount of rehabilitation therapy received in CCC is minimal. In 2014/15, stroke survivors in CCC received less than 30 minutes per day (median) of physiotherapy, occupational therapy or speech-language therapy. This is below the rehabilitation intensity levels described in the *Quality-Based Procedures: Clinical Handbook for Stroke*, which recommends that stroke patients in inpatient rehabilitation should receive, through an individualized treatment plan, at least 3 hours of direct task-specific therapy per day from an interprofessional stroke team for at least 6 days per week.[8,*] Stroke survivors in LTC receive even

* Recommendations in the 2016 *Quality-Based Procedures: Clinical Handbook for Stroke (Acute and Postacute)* cover the first 60 days postdischarge and note that many stroke patients require ongoing care, including CCC and LTC, beyond this time frame.[8] The Canadian Stroke Best Practice Recommendations were used as the reference standard in the development of the Ontario stroke quality-based procedures.[20] Hence, for the purposes of the present report, which addresses both the CCC and LTC sectors (covering data years 2010/11 to 2014/15), applicable CSBP Recommendations are referenced; where variation exists, the QBP standard is referenced.

lower low levels of therapy — less than 10 minutes of physiotherapy per day and negligible amounts of occupational therapy and speech-language therapy. Between 2010/11 and 2014/15, the proportion of stroke survivors accessing physiotherapy in LTC decreased from 74.0% to 63.8% (p<0.0001), and the proportion of stroke survivors receiving nursing restorative care programming declined from 28.5% to 11.4% (p<0.0001). Canadian Stroke Best Practice Recommendations state that stroke survivors should have access to recreation therapy; the proportion of stroke survivors receiving this therapy declined from 8.9% in 2010/11 to 4.3% in 2014/15.[32] The minimal amount of core rehabilitation therapies (physiotherapy, occupational therapy and speech-language therapy), nursing rehabilitation/restorative care and recreation therapy provided to stroke survivors in CCC and LTC may not be adequate to address physical and cognitive needs, increase social engagement or optimize quality of life. These trends suggest that the care of stroke survivors, particularly those in LTC, is not focused on rehabilitation or restorative care models.

The observed increase in the proportion of LTC stroke survivors classified into the clinically complex RUG-III category, the decrease in those classified into the special rehabilitation RUG-III category, and the decline in the proportion of stroke survivors accessing rehabilitation services and nursing restorative care programming may be associated with policy changes that occurred in the LTC sector during the study period.

First, between 2009 and 2012, RAI-MDS 2.0 was implemented across the LTC sector, resulting in the RUG-III classification being used as the case mix indicator for funding of the LTC nursing and personal care envelope. During this period, data quality issues were identified with resident classification into the RUG-III categories, particularly the special rehabilitation category. Thus, coding practices may have contributed to the observed decline in the proportion of stroke survivors classified into the special rehabilitation RUG.

Second, in 2013 the Ministry of Health and Long-Term Care (MOHLTC) introduced physiotherapy reform into LTC, which resulted in changes to funding for physiotherapy services.[35] Prior to this, services were delivered in LTC as insured services paid through the Ontario Health Insurance Program (OHIP). The MOHLTC created a new funding envelope using a per bed per year formula to be used exclusively to purchase or provide physiotherapy services including those of both physiotherapists and physiotherapy aides. The switch to a per bed per year funding formula and associated policy directions slowed growth in the provision of physiotherapy services (personal communication, Nancy Cooper, Ontario Long Term Care Association, December 2017). Limited occupational therapy and speech-language therapy services are available through the LHIN Home and Community Care Program or are purchased privately by stroke survivors. RAI-MDS 2.0 does not capture the details of physiotherapy treatment plans, physiotherapy goals or the amount of physiotherapy provided each day. However, the new physiotherapy funding policy requires LTC homes to submit this specific information to the MOHLTC. We did not have access to this data, and further review of the ministry's physiotherapy reports through the Health Data Reports is recommended.

In examining the two subpopulations — male/female and urban/rural — numerous statistically significant differences (p <0.01) were observed in both the burden of stroke and inequities in care. Of particular note, female stroke survivors are older, more likely to be living alone, require greater assistance with ADLs, and have a higher prevalence of atrial fibrillation and depression than their males counterparts; male stroke survivors are more likely to experience a fall and be prescribed antipsychotic medication with a diagnosis of dementia. With respect to rural/urban differences, rural stroke survivors have less access to the core rehabilitation therapies and are more likely to experience a fall compared to their urban counterparts. These findings continue to shed light on the need to address inequities in care between men and women and between stroke survivors living in rural and urban settings.

Access and patient flow

Fewer stroke survivors were admitted to CCC after an acute stroke between 2010/11 and 2014/15 and the average length of stay in CCC in 2014/15 was 79.5 days compared to 113 days reported prior to 2010/11. The total mean time spent in institutional care decreased by 30 days for all stroke survivors admitted to CCC between 2010/11 and 2014/15. Stroke survivors who receive access to inpatient

rehabilitation prior to admission to CCC are more likely to be discharged to independent or semi-independent settings compared to those admitted directly to CCC following their acute stroke stay (52.4% vs. 48.4.%, p≥0.05). However, further analyses are required to evaluate whether the observed difference in discharge to an independent or semi-independent setting is due to stroke survivor characteristics, availability of social supports, and/or other system factors such as variation in access to inpatient rehabilitation or CCC beds across the province.

In 2014/15, stroke survivors who were directly transferred to LTC from an acute care setting were typically older and with more severe strokes or were residing in LTC at the time of their stroke onset. Of the approximately 1,400 stroke survivors who were admitted to LTC in 2014/15 following an acute stroke, over half (57%) were transferred directly from acute care. Nonetheless, an increase in the number of stroke survivors admitted to LTC from inpatient rehabilitation has been observed and may be a reflection of efforts to increase access to inpatient rehabilitation for survivors of severe stroke.[11] Continued efforts are needed to ensure access to inpatient rehabilitation where an interprofessional team approach and intensive rehabilitation are offered.

Outcomes

The health-related quality of life (HRQL) of stroke survivors at the full assessment after a stroke or TIA was very low (0.32 for CCC and 0.37 for LTC in 2014/15), which reflects the recovery challenges that they face. However, compared to the general LTC population in Ontario, stroke survivors in LTC have a higher HRQL (0.29 and 0.37, respectively) but a much lower HRQL than stroke survivors in the community who received home care services in 2014/15 (0.37 and 0.48, respectively).[26,29] A difference of 0.03 is considered to be clinically important.[36] The limited access to recreation and rehabilitation therapy, as well as the presence of other comorbidities (e.g., dementia, Alzheimer's disease and depression) and limitations in communication abilities, may reflect the poor HRQL among stroke survivors in CCC and LTC.

Most stroke survivors in CCC are discharged prior to the 90-day quarterly assessment; therefore, the extent of functional improvement achieved during their stay is not known. However, among stroke survivors in CCC and LTC who did receive a 90-day quarterly assessment, 26% of those in CCC and 58% of those in LTC had a minimal change in ADL scores (on average, there was a 0.5 change; data not shown). A change of one point in the ADL scale denotes a clinically meaningful change.[37] The improvement in social engagement observed among those with 90-day quarterly assessments was less than 5% for stroke survivors in both settings (data not shown). Focused efforts to address the low degree of social engagement and poor HRQL scores for stroke survivors in both CCC and LTC may include a review of resource allocation for nursing restorative care, core rehabilitation therapies (occupational therapy, physiotherapy and speech-language therapy) and recreation therapy in CCC and LTC. Increased efficiencies and improvements in functional outcomes and HRQL scores may be realized with dedicated resources allocated to these programs.

In 2014/15, 45.7% of CCC stroke survivors were discharged to independent or semi-independent living, compared to 37.8% in 2010/11, and there was a corresponding decline in the proportion of survivors discharged to LTC: from 23.4% in 2010/11 to 17.1% in 2014/15. Compared to the general CCC population, stroke survivors are more likely to be discharged to independent or semi-independent living (40.7% and 45.7%, respectively, in 2014/15).[17] With almost half of stroke survivors discharged to the community from CCC after a mean length of stay of 79 days (median, 58 days) and with minimal rehabilitation provided, a better option may be admission to more intensive inpatient rehabilitation where the discharge-to-home rate is 81.9%.[11] Access to inpatient rehabilitation prior to CCC admission may be contributing to the decrease in length of stay in CCC, as well as the increase in the proportion of stroke survivors discharged to the community from CCC. However, it is concerning that over 20% of stroke survivors discharged from CCC are readmitted to acute care within 30 days of discharge. Factors such as the medical complexity and high care needs

of this population (e.g., the presence of comorbidities and extensive assistance with activities of daily living), the effectiveness of discharge and transition planning, access to primary care follow-up, and limited community support services to address stroke survivor and caregiver needs may be reflected in these findings. The limitations in the database (e.g., an RAI-MDS 2.0 assessment not completed at discharge) do not permit a determination of the level of functioning or the burden of care upon discharge to the community setting.

Limitations

The following limitations should be considered when interpreting the findings in this report.

1. The lack of data prevented evaluation of a number of key processes and outcomes of care:

    a. RAI-MDS 2.0 assessments are not required if the length of stay is less than 14 days, and therefore, reported stroke survivor characteristics and measures of quality are only among long-stay stroke survivors, which comprise approximately 95% of stroke survivors admitted to CCC.

    b. Change in functional outcomes within CCC could not be comprehensively evaluated given that approximately 75% of stroke survivors were discharged prior to a follow-up assessment. Follow-up assessments are conducted with the RAI-MDS 2.0 at 90 days or when there is a change in clinical status.

    c. The appropriateness of stroke survivors being transferred to CCC could not be evaluated due to insufficient AlphaFIM® (CIHI-DAD) data collected for acute care in 2014/15. The *Quality-Based Procedures: Clinical Handbook for Stroke* recommends that stroke survivors with an AlphaFIM score of 40 to 80 should be referred to inpatient rehabilitation.[8]

    d. The full extent of the care received in CCC and LTC could not be determined due to the constraints of the RAI-MDS 2.0 assessment protocol. Care needs, level of functioning and amount of therapy received are assessed based only on a 7-day look-back period. As well, rehabilitation therapy and nursing restorative care must be provided for at least 15 minutes a day in the previous 7 days in order to be captured in the RAI-MDS 2.0 assessment.

    e. The delivery model for rehabilitation care in CCC and LTC could not be fully evaluated. The amount of one-to-one intensive rehabilitation therapy being provided is unknown. As well, the delivery and documentation of recreation therapy and recreation/activity programming varies among facilities.

    2. The inability to identify stroke survivors admitted to the convalescent care beds funded in LTC facilities prevents a comprehensive evaluation of access to and utilization of these beds within the health care system and associated stroke survivor outcomes.

3. Anticoagulation therapy was calculated using the ODB claims database, which is based on filled prescriptions rather than medications used.

4. Medication use was analyzed using the RAI-MDS 2.0 assessment and was based on whether the patient received medication at any time during the 7-day look-back period, not whether the medication was used daily.

5. Stroke survivors were identified as having depression, dementia and/or Alzheimer's disease using the CCRS database. Other databases, such as the CIHI-DAD, OHIP, ODB and OHMRS (the Ontario Mental Health Reporting System), were not cross-referenced, possibly resulting in an underreporting of these conditions.

6. Stroke rehabilitation, restorative care and functional outcomes have not been fully studied in CCC and LTC settings; this research gap limits the interpretation of the data findings.

7. Mortality and readmissions are not risk-adjusted, and readmissions do not take into account the competing risk of death.

Conclusions

1. Stroke survivors in CCC and LTC settings have high care needs requiring extensive assistance with activities of daily living. Their low degree of social engagement and poor health-related quality of life are concerning.

2. Rehabilitation for stroke survivors in CCC consists primarily of physiotherapy and occupational therapy; in LTC, rehabilitation is almost exclusively physiotherapy. For both sectors, the time spent in rehabilitation therapy and recreation therapy per day is minimal, and access to physiotherapy and nursing restorative care in LTC has declined over time. Low health-related quality of life scores may be attributed to limited rehabilitation, nursing restorative care and recreation therapy, and to depression and pain.

3. Offering stroke survivors with complex needs access to inpatient rehabilitation prior to CCC or LTC may increase their rate of discharge to the community, thereby avoiding transfer to these settings. However, for stroke survivors transferred to CCC and then discharged to the community, the high rate of hospital readmission in the 30 days following discharge warrants further investigation of underlying factors, such as the community's ability to support stroke survivors with high care needs, the effectiveness of discharge and transition planning, and the availability of social supports.

4. Stroke best practices, such as screening of mood, cognitive functioning and assessment of pain, were completed for all stroke survivors with a length of stay of more than 14 days.

5. Given that most stroke survivors in CCC were discharged prior to the 90-day quarterly RAI-MDS 2.0 assessment (the average length of stay in CCC is 80 days), there is very limited data on functional and cognitive outcomes at discharge from CCC to

understand the effectiveness of rehabilitation and nursing restorative care, and to determine how best to utilize CCC beds in the stroke recovery process.

6. Given the limited availability of rehabilitation and recreation therapy and the decline of nursing restorative care programing in LTC, defining the role of LTC in the stroke recovery trajectory will become imperative, especially in the context of an aging population and overall health care system pressures.

7. Further research is needed to better understand the care received by stroke survivors while in CCC and LTC and their associated health outcomes. Specifically, more research is required to:

   a. Identify the factors contributing to the transfer of stroke survivors to CCC instead of admission to inpatient rehabilitation where there is greater access to rehabilitation therapy (at higher levels of intensity), interprofessional care and one-to-one goal-directed therapy.

   b. Identify the factors influencing transitions of stroke survivors from CCC and LTC to inpatient rehabilitation.

   c. Evaluate the observed difference in discharge to the community between stroke survivors admitted to inpatient rehabilitation prior to CCC compared to stroke survivors admitted directly to CCC following an acute stroke to determine if this is due to patient characteristics and/or other system factors such as the variation in access to and the use of inpatient rehabilitation and CCC beds across the province.

   d. Evaluate stroke survivors discharged to independent and semi-independent living to determine how long they remain in the community and to identify the factors associated with hospital readmission and admission to LTC.

   e. Examine the impact of best practice resources such as *Taking Action for Optimal Community and Long-Term Stroke Care*[5] and Stroke Care Plans for Long-Term Care[6] on care delivery, staff knowledge and quality indicator performance in CCC and LTC.

   f. Examine the implementation of Canadian Stroke Best Practice Recommendations in the CCC and LTC settings and develop stroke best practices specific to LTC that recognize the unique characteristics of LTC in the areas of funding, assessment, care delivery, staffing models, and Ministry of Health and Long-Term Care requirements and regulations

   g. Continue to study the provision of stroke care in LTC over an extended timeframe (i.e., beyond the 90-day reassessment) using the RAI-MDS 2.0 quality indicators to measure changes in health and functional status and evaluate the delivery of care in this setting.

   h. Continue to study the provision of physiotherapy in LTC based on the data the facilities submit to the Ministry of Health and Long-Term Care in adherence with physiotherapy funding reform to evaluate the impact on falls, activities of daily living, pain, mood, social engagement and quality of life.

   i. Clarify the role of rehabilitation in the LTC setting by identifying when in the stroke recovery trajectory the focus should be on achieving optimal functional status, (including processes and opportunities for reassessment if recovery occurs), and when the focus should shift to maintenance of gains or mitigation of deterioration.

Recommendations

1. The limited provision of rehabilitation to stroke survivors in CCC and LTC settings warrants review of resource allocation and models of care for rehabilitation therapy and nursing restorative care programming to inform an appropriate delivery model for these settings.

2. The findings of this report should be considered a component of CorHealth Ontario's Rehabilitation Call-to-Action.

3. Ontario's Regional Stroke Networks and regional community and LTC coordinators should continue to work together to ensure that their activities inform and align with priorities within the LTC sector (e.g., behavioural support initiatives, fall prevention and pain management) to advance stroke best practices and staff education:

   a. Regional Stroke Networks and regional community and LTC coordinators should leverage existing stroke care resources (e.g., *Taking Action for Optimal Community and Long-Term Stroke Care*[5] and Stroke Care Plans for Long-Term Care[6]) and existing technologies (e.g., learning management systems, software solutions) and consider partnerships with stakeholders, such as the Registered Nurses Association of Ontario and its LTC best practice coordinators.

   b. LTC and CCC staff should continue to receive ongoing training in secondary stroke prevention, fall prevention, pain management and highly prevalent poststroke complications, such as bladder incontinence and depression.

   c. LTC facilities should incorporate best-practice care interventions, as outlined in the Stroke Care Plans for Long-Term Care,[6] into their care planning libraries.

4. The Local Health Integration Networks, Regional Stroke Networks and local stakeholders should continue their efforts to increase access to inpatient rehabilitation for severe stroke survivors in alignment with the Canadian Stroke Best Practice Recommendations[7] and the *Quality-Based Procedures: Clinical Handbook for Stroke*.[8]

5. Local Health Integration Networks, Regional Stroke Networks and other rehabilitation stakeholders, such as the Rehabilitation Care Alliance, should continue to strengthen rehabilitation transitions of care.

6. A standardized measurement and reporting framework for rehabilitation care, services and outcomes across settings (i.e., inpatient and outpatient rehabilitation, CCC and LTC) should be considered part of the Ministry of Health and Long-Term Care's Information Strategy 2.0. This framework should enable improved evaluation and understanding of bed utilization and the rehabilitative system of care and be used to inform policy development, resource allocation, system planning and stroke best-practice implementation.

LONG-TERM CARE EXPERIENCE

"As is the case in any health care facility, ongoing education is crucial in assisting the staff to provide the best care possible to our residents. The training offered by our Regional Stroke Network has increased our understanding of stroke and how it affects residents, both physically and mentally. This knowledge better enables staff to care for residents and maintain their health and well-being. Taking Action for Optimal Community and Long-Term Stroke Care is an informative and easy-to-use resource for health care providers. This guide and the support offered by the Regional Stroke Network help us strive toward continuous quality improvements and enhance the residents' quality of life through meaningful, person-centred care."

– Director of Long-Term Care

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Appendices

APPENDIX A

EXHIBIT A-1 Proportion of stroke survivors in complex continuing care who received rehabilitation therapy,[1] by RUG- III group and type of therapy, in Ontario, 2010/11 to 2014/15

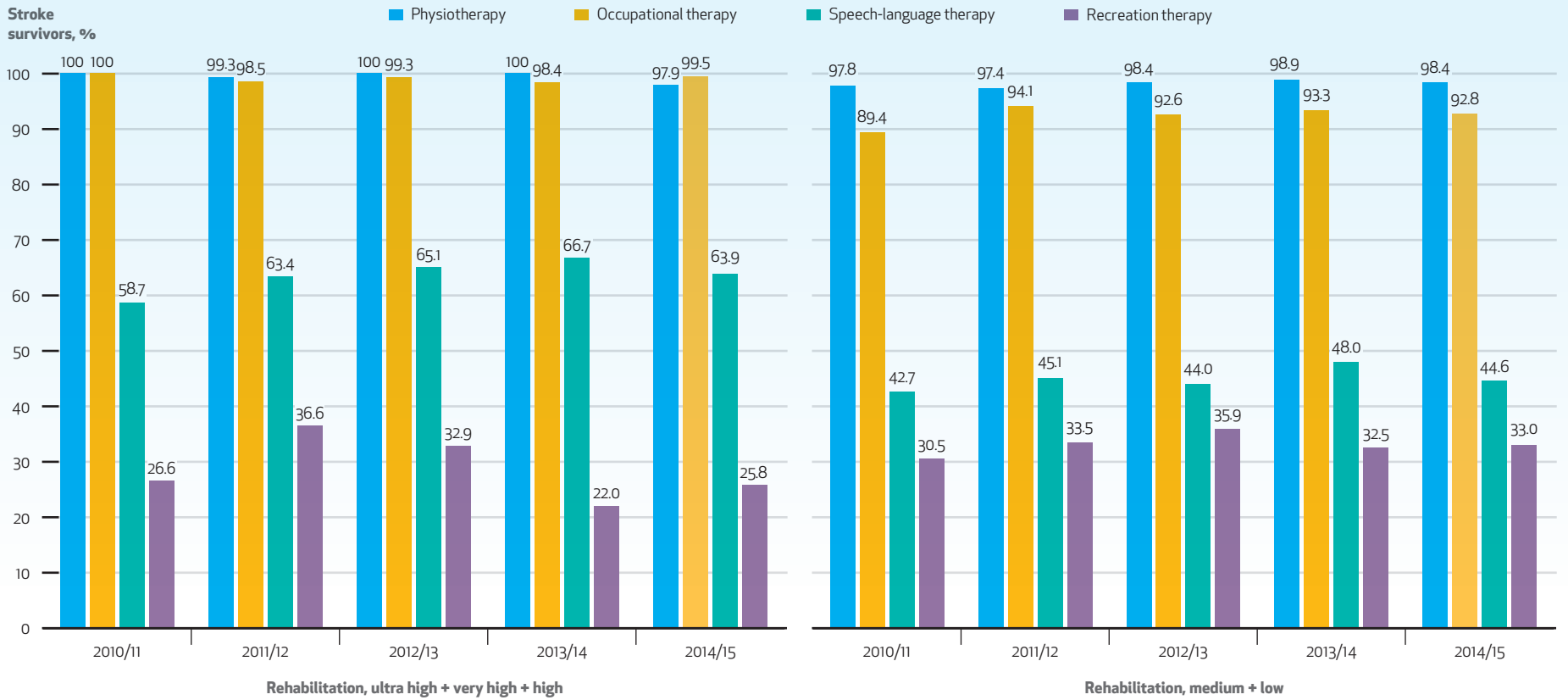
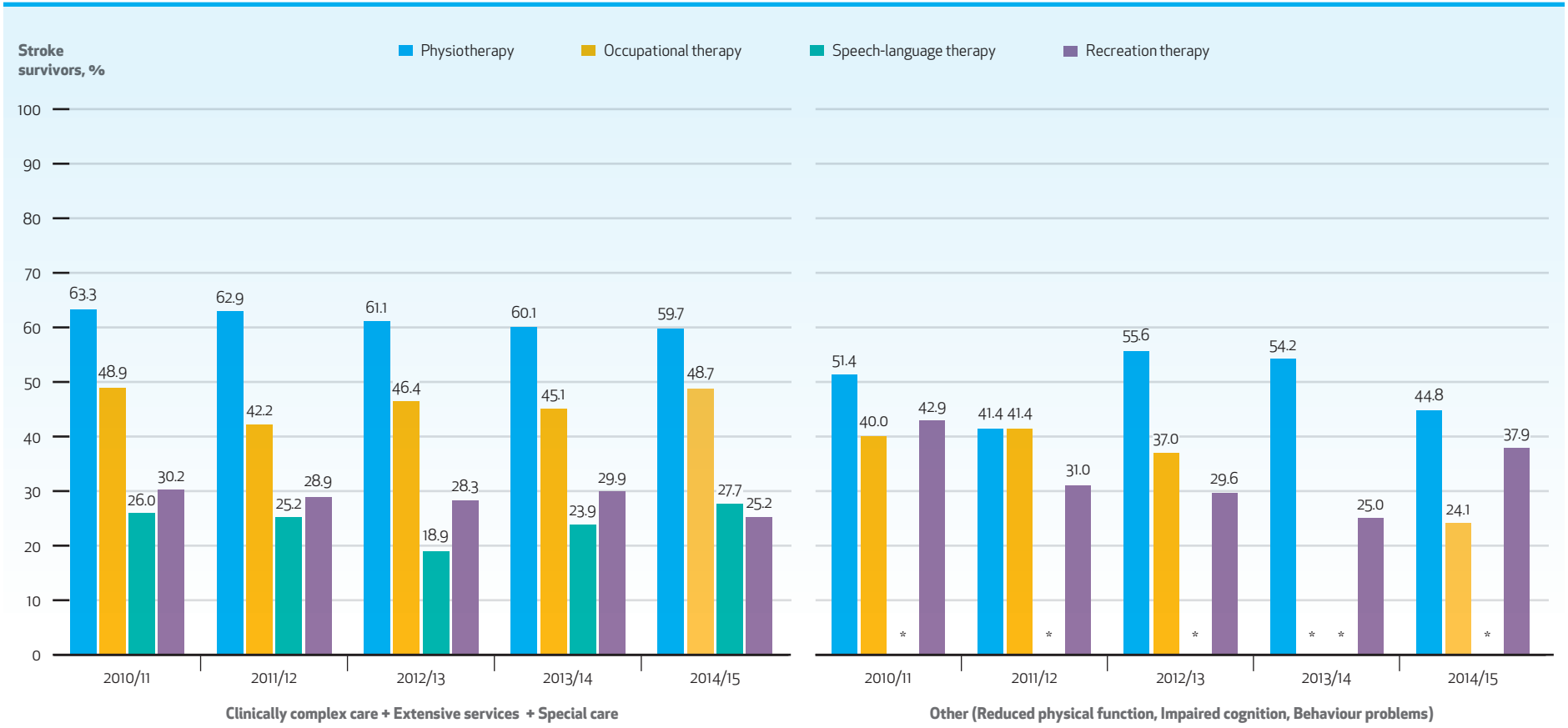


EXHIBIT A-1 continued



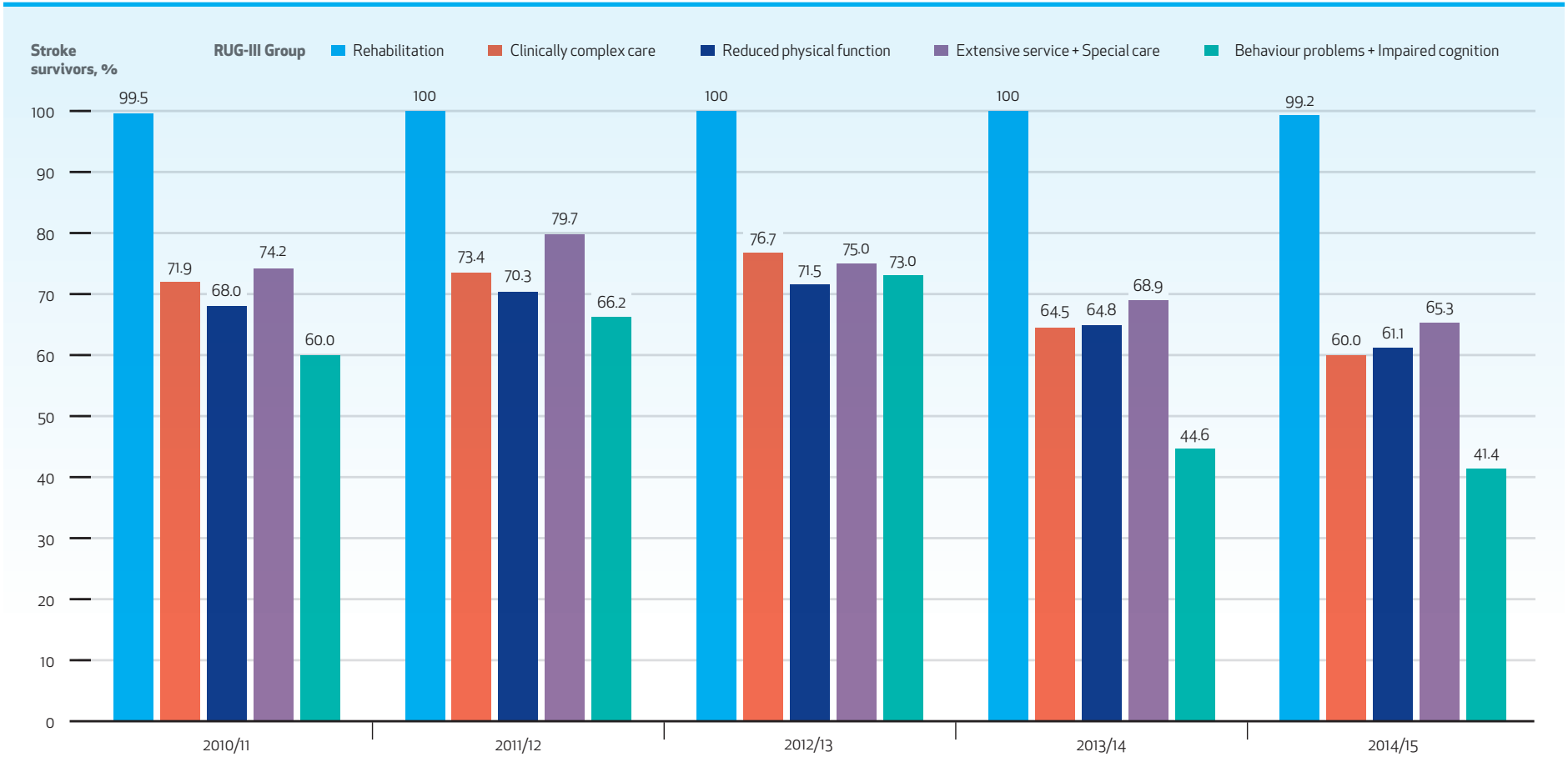
Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Therapy was provided in the 7 days prior to the full RAI-MDS 2.0 assessment.

* In accordance with ICES policy, the exact number is suppressed when its value is <6.

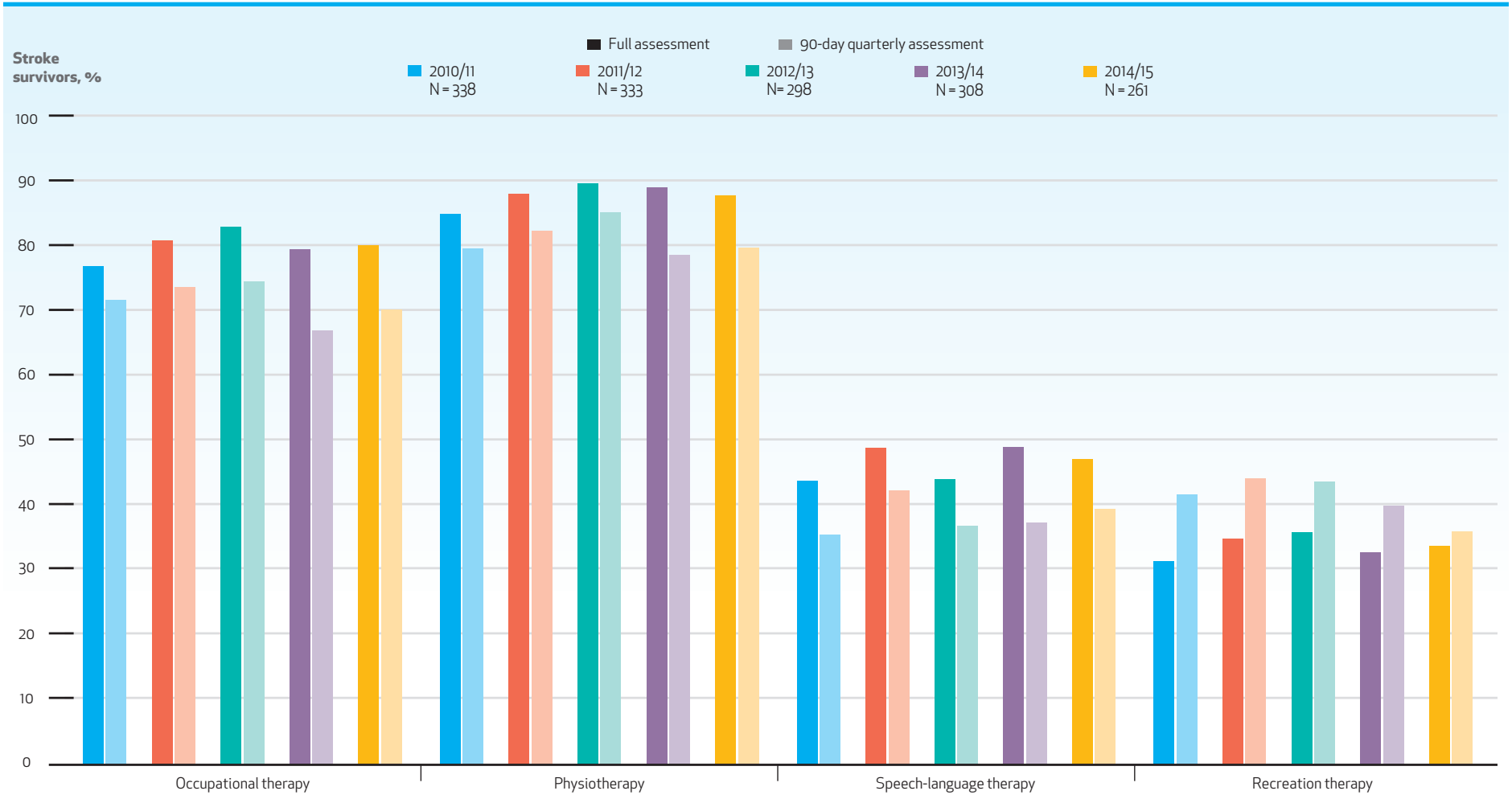
EXHIBIT A-2 Proportion of stroke survivors in long-term care who received physiotherapy,[1] by RUG-III group, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.
Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database and had a length of stay in long-term care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA.

[1] Therapy was provided in the 7 days prior to the full RAI-MDS 2.0 assessment.

EXHIBIT A-3 Proportion of stroke survivors in complex continuing care with both full and 90-day quarterly RAI-MDS assessments who received rehabilitation therapy,[1] by type of therapy, in Ontario, 2010/11 to 2014/15

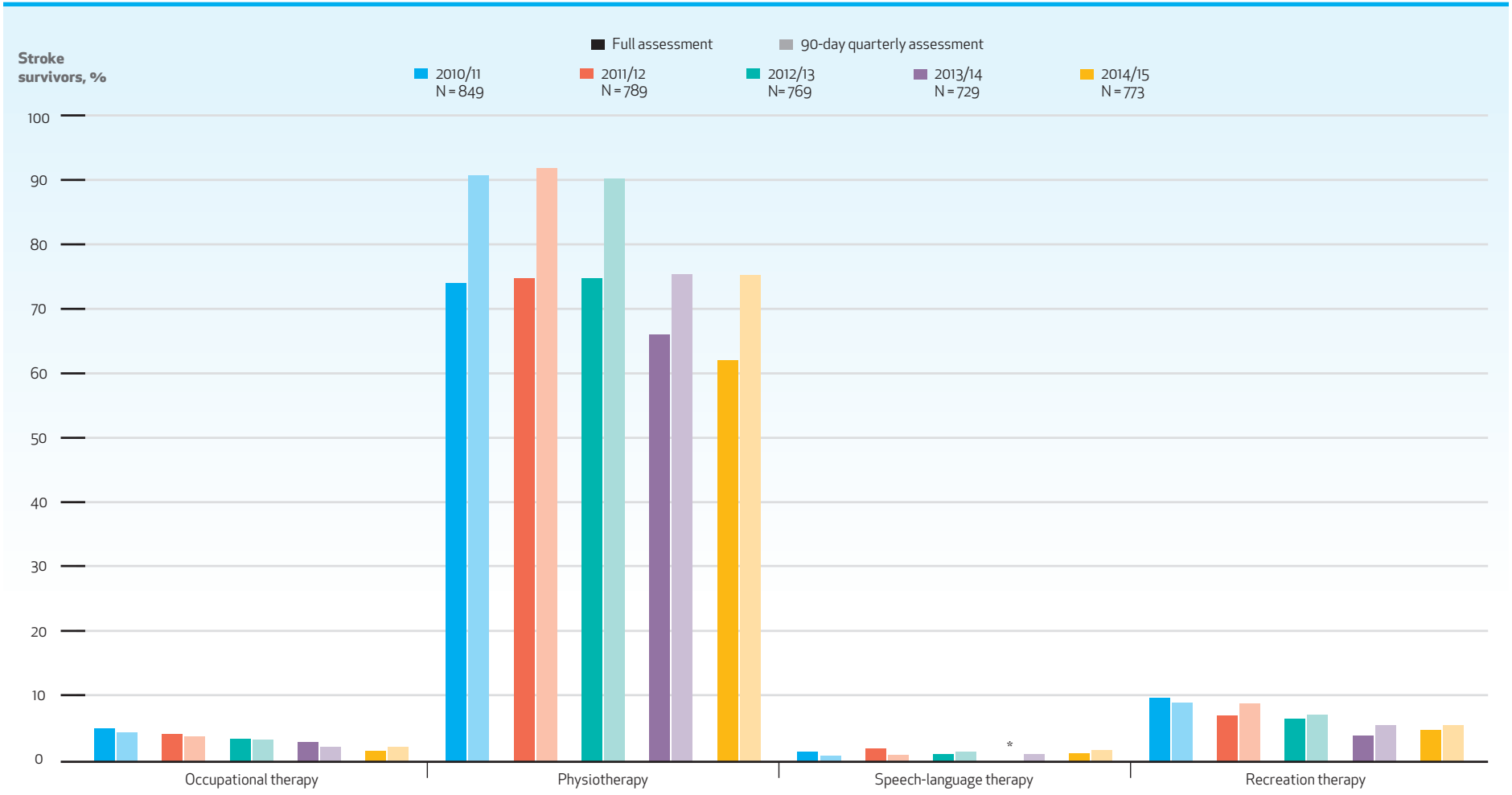


Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–CCC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–CCC database within 6 months of discharge from acute care and had a length of stay in complex continuing care of 14 days or more and a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a 90-day RAI-MDS 2.0 quarterly assessment.

[1] Therapy was provided in the 7 days prior to the full RAI-MDS 2.0 assessment.

EXHIBIT A-4 Proportion of stroke survivors in long-term care with both full and 90-day quarterly RAI-MDS 2.0 assessments who received rehabilitation therapy,[1] by type of therapy, in Ontario, 2010/11 to 2014/15



Data sources: CIHI–DAD, 2010/11 to 2014/15; CCRS–LTC, 2010/11 to 2015/16.

Inclusion criteria: All survivors discharged alive following an acute care hospitalization for stroke or TIA (from CIHI–DAD, 2010/11 to 2014/15) who appeared in the CCRS–LTC database within 6 months of discharge from acute care and had a length of stay in long-term care of 14 days or more, and a full RAI-MDS 2.0 assessment after the acute stroke or TIA and a follow-up RAI-MDS 2.0 assessment.

[1] Therapy was provided in the 7 days prior to the full RAI-MDS 2.0 assessment.

* In accordance with ICES policy, the exact number is suppressed when its value is <6.

EXHIBIT A-5 Characteristics, care and outcomes of residents in complex continuing care and long-term care,[1] 2014/15

Resident Characteristics

Characteristics, n (%)	CIHI-CCRS Ontario CCC residents	CIHI-CCRS Ontario LTC residents	Exhibit
All residents, N	28,012	115,715	
Female	15,239 (54.4)	78,108 (67.5)	1.1a & b
Age, mean	77	83	1.1a & b
<65 years	4,986 (17.8)	7,869 (6.8)	
≥86 years	9,804 (35.0)	62,370 (53.9)	

Characteristics, n (%)	CIHI-CCRS Ontario CCC residents	CIHI-CCRS Ontario LTC residents	Exhibit
All assessed residents, N	19, 116	104,467	
Transient ischemic attack	733 (3.8)	5,572 (5.3)	1.1a & b
Dementia	4,438 (23.2)	65,113 (62.3)	1.1a & b
Alzheimer's disease	859 (4.5)	17,722 (17.0)	1.1a & b
Feeding tube	1,268 (6.6)	1,258 (1.2)	1.1a & b
ADL Hierarchy Scale score			
Independent/supervised/limited assistance (0–2)	4,939 (25.8)	18,778 (18.0)	1.3
Extensive assistance (3–4)	5,795 (30.3)	50,999 (48.8)	1.3
Dependent/total dependence (5–6)	8,382 (43.9)	34,690 (33.2)	1.3
Aggressive Behaviour Scale score[2]			
No aggressive behaviour (0)	13,597 (72.0)	56,322 (54.0)	1.3
Some aggressive behaviour (1–2)	2,979 (15.8)	24,742 (23.7)	1.3
Severe aggressive behaviour (3–5)	1,646 (8.7)	16,515 (15.8)	1.3
Very severe aggressive behaviour (6+)	650 (3.4)	6,655 (6.4)	1.3
Incontinence, n (%)			
Bowel control			
Continent	10,166 (53.2)	46,680 (44.7)	1.3
Some incontinence[3]	1,584 (8.3)	7,638 (7.3)	1.3
Incontinent	7,366 (38.5)	50,149 (48.0)	1.3
Bladder control			
Continent	10,583 (55.4)	26,131 (25.0)	1.3
Some incontinence[4]	1,762 (9.2)	10,305 (9.9)	1.3
Incontinent	6,771 (35.4)	68,031 (65.1)	1.3

Data source: CIHI Continuing Care Reporting System Quick Stats, 2014/15.

[1] Indicators in this report vary slightly from the indicators reported in the CCRS-Quick Stats due to inclusion/exclusion criteria, time of report runs and other factors.

[2] Score not calculated on residents who were comatose (18,872 in complex continuing care and 104,234 in long-term care).

[3] Continent includes complete bowel control and usually continent (incontinent less than weekly). Occasionally incontinent includes incontinent once a week. Incontinent, includes frequently incontinent (incontinent 2 to 3 times a week) and incontinent all of the time.

[4] Continent includes complete bladder control and usually continent (incontinent episodes once a week or less). Occasionally incontinent includes incontinent 2 or more times a week. Incontinent includes frequently incontinent (incontinent daily with some control present) and inadequate control with multiple daily episodes.

[5] Other includes inpatient psychiatric, inpatient rehabilitation, other/unclassified, ambulatory discharge destinations and missing.

EXHIBIT A-5 continued

Best Practice Care

Characteristics, n (%)	CIHI-CCRS Ontario CCC residents	CIHI-CCRS Ontario LTC residents	Exhibit
All assessed residents, N	19,116	104,467	
Therapy			
Physiotherapy	14,482 (75.8)	53,728 (51.4)	4.1a & b
Occupational therapy	12,318 (64.4)	1,473 (1.4)	4.1a & b
Speech-language therapy	2,929 (15.3)	357 (0.3)	4.1a & b
Recreation therapy	5,917 (31.0)	6,516 (6.2)	4.1a & b
Depression			
Diagnosis	3,865 (20.2)	34,011 (32.6)	5.1
Risk (Depression Rating Scale score of ≥3)[2]	4,425 (23.4)	33,898 (32.5)	5.1
Cognitive Performance Scale score			
Cognitively intact (0)	4,844 (25.3)	12,027 (11.5)	6.1
Mild impairment (1-2)	6,459 (33.8)	26,250 (25.1)	6.1
Moderate impairment (3)	3,600 (18.8)	35,638 (34.1)	6.1
Severe impairment (4-6)	4,213 (22.0)	30,552 (29.2)	6.1
Falls			
Yes	5,406 (28.3)	17,513 (16.8)	10.1a
Pain Scale score			
No pain (0)	5,642 (29.5)	68,289 (65.4)	8.1a & b
Less than daily pain (1)	5,794 (30.3)	24,916 (23.9)	8.1a & b
Daily moderate pain (2)	6,450 (33.7)	9,381 (9.0)	8.1a & b
Daily severe pain (3)	1,230 (6.4)	1,881 (1.8)	8.1a & b
Medication use			
Analgesic	15,147 (79.2)	73,136 (70.0)	9.2a & b
Antidepressant	6,548 (34.3)	56,379 (54.0)	9.2a & b
Antipsychotic	4,343 (22.7)	29,230 (28.0)	9.2a & b
Antianxiety	3,652 (19.1)	12,554 (12.0)	9.2a & b
Hypnotic	3,888 (20.3)	5,079 (4.9)	9.2a & b
Diuretic	5,613 (29.4)	31,282 (29.9)	9.2a & b

Characteristics, n (%)	CIHI-CCRS Ontario CCC residents admitted for ≥90 days	CIHI-CCRS Ontario LTC residents admitted for ≥90 days	Exhibit
Quality indicators, unadjusted rates			
Experienced a fall	814 (7.7)	39,416 (14.1)	10.1b & c
Taken antipsychotics without a diagnosis of psychosis	1,882 (21.5)	67,028 (27.1)	9.3b & c

Outcomes

Characteristics, n (%)	CIHI-CCRS Ontario CCC residents	Exhibit
All residents discharged	22,663	
Discharge destination		
Independent/semi-independent living	9,230 (40.7)	13.1a
Home care service	5,067 (22.4)	13.1a
Private home (no home care)	2,858 (12.6)	13.1a
Residential care service (retirement home/assisted living)	1,305 (5.8)	13.1a
Residential care service (24-hour nursing) [Long-term care]	2,432 (10.7)	13.1a
Inpatient acute care service	1,991 (8.8)	13.1a
Deceased	7,910 (34.9)	13.1a
Other[5]	901 (4.0)	13.1a
Inpatient continuing care service	199 (0.9)	13.1a

Data source: CIHI Continuing Care Reporting System Quick Stats, 2014/15.

[1] Indicators in this report vary slightly from the indicators reported in the CCRS-Quick Stats due to inclusion/exclusion criteria, time of report runs and other factors.

[2] Score not calculated on residents who were comatose (18,872 in complex continuing care and 104,234 in long-term care).

[3] Continent includes complete bowel control and usually continent (incontinent less than weekly). Occasionally incontinent includes incontinent once a week. Incontinent, includes frequently incontinent (incontinent 2 to 3 times a week) and incontinent all of the time.

[4] Continent includes complete bladder control and usually continent (incontinent episodes once a week or less). Occasionally incontinent includes incontinent 2 or more times a week. Incontinent includes frequently incontinent (incontinent daily with some control present) and inadequate control with multiple daily episodes.

[5] Other includes inpatient psychiatric, inpatient rehabilitation, other/unclassified, ambulatory discharge destinations and missing.

APPENDIX B Glossary

Term/Acronym	Definition
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 care 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.
ADL	Activities of daily living
Atrial fibrillation	An irregular heartbeat (arrhythmia) that can increase one's risk for blood clots, stroke and other heart-related complications.
Behaviour problems	Residents displaying behavior such as wandering, verbally or physically abusive or socially inappropriate, or who experience hallucinations or delusions
CCC	Complex continuing care
CCRS	Continuing Care Reporting System; captures clinical and demographic information for residents receiving facility-based continuing care services.
Charlson Comorbidity Index	An index commonly used in health services research to capture the effect of any of 22 diseases, such as diabetes or congestive heart failure, that a patient may have in addition to the disease of interest that affects an outcome (e.g., mortality, length of stay, cost). Each of the diseases is assigned a value, and the sum of the values produces a patient's Charlson score. A higher score indicates a greater burden of comorbid illness.
CHESS Scale	Changes in Health, End-Stage Disease, Signs and Symptoms Scale; a higher score indicates greater medical complexity and is associated with adverse outcomes (e.g., mortality, hospitalization and pain)
CIHI	Canadian Institute for Health Information
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-NRS	CIHI's National Rehabilitation Reporting System; contains client data collected from participating adult inpatient rehabilitation facilities and programs across Canada.
Clinically complex	Residents receiving complex clinical care or with conditions requiring skilled nursing management and interventions for conditions and treatments such as burns, coma, septicemia, pneumonia, foot infections or wounds, internal bleeding, dehydration, tube feeding, oxygen, transfusions, hemiplegia, chemotherapy, dialysis, physician visits/order changes.
Fall	Any unintentional change in position where the resident ends up on the floor, ground or other lower level. Includes falls with or without injury.
Health-Related Quality of Life (HRQL)	A measure of general well-being of individuals that covers both negative and positive aspects of life. It is difficult to consistently use the term. This reports operationalizes it using the Minimum Data Set Health Status Index (MDS-HSI) that captures HRQL derived from mapping selected items from the full RAI-MDS 2.0 assessment to six attributes; vision, hearing and speech, mobility, self-care, cognition, emotion and pain.

Term/Acronym	Definition
ICD-10-CA	An enhanced version of the ICD-10 (International Classification of Diseases and Related Health Problems, 10th Revision), developed by CIHI for morbidity classification in Canada
Impaired cognition	Residents having cognitive impairment in decision-making, recall or short-term memory. Their RAI-MDS 2.0 score is 3 or greater.
LOS	Length of stay
LTC	Long-term care
MOHLTC	Ministry of Health and Long-Term Care
ODB	Ontario Drug Benefit claims database
RAI-MDS 2.0	Resident Assessment Instrument – Minimum Data Set is a standardized assessment tool used by trained clinicians in CCC and LTC facilities in Ontario. The assessments are done within 13 days of admission to the facility and on a quarterly basis during the stay. There are two types of assessment: full and quarterly. The full assessment is done annually or when there has been a significant change to a resident's health status.
Reduced physical function	A RUG-III category ranked as the least resource intensive category. Residents whose needs are primarily for activities of daily living and general supervision.
Recreation therapy	Therapy that provides therapeutic stimulation beyond the general activity program in a facility and is provided by a provincial/territorial licensed or nationally certified therapeutic recreation specialist or therapeutic recreation assistant.
Rehabilitative Care Alliance	An Ontario-wide collaborative established in 2013 by Ontario's 14 Local Health Integration Networks to build on the work of the Rehabilitation and Complex Continuing Care Expert Panel.
Rehabilitation intensity	A measure of the amount of time a patient/survivor spends in individual, goal-directed rehabilitation therapy focused on physical, functional, cognitive, perceptual , communicative and social goals to maximize the patient's/survivor's recovery over a 7-day-a-week period. The patient/survivor is engaged in active face-to-face treatment, which is monitored or guided by a therapist. This definition was developed through literature review, expert consensus, and stakeholder engagement by the Stroke Reference Group, and was approved by the Ontario Stroke Network; this definition was later revised by the regional stroke rehabilitation coordinators group to include the term 'communicative.'
Restorative care	Refers to nursing intervention program that assists or promotes the resident ability to attain maximum potential. The intervention must exceed routine nursing care and be provided by clinical staff (registered nurse, registered/licensed practical nurse, assistant/aide) trained in the interventions. Interventions include: passive range of motion, active range of motion, splint or brace assistance, bed mobility, transfer, walking, dressing or grooming, eating or swallowing, amputation or prosthesis care, communication, other. Resident progress in the interventions must be evaluated and documented. Interventions can be in a group of not more than 4 individuals and must be at least 15 minutes in duration.

Term/Acronym	Definition
RPDB	Registered Persons Database; provides basic demographic information about anyone who has ever received an Ontario health card number.
RUG-III	Resource Utilization Group, Version III; a grouping methodology applied to RAI-MDS 2.0 Canadian version assessment data submitted to the CCRS that uses over 100 clinical variables to group persons into 44 groups within 7 hierarchical levels according to patterns of resource use. Ontario LTC homes use 34 groups.
SAS	Statistical Analysis System software; used for advanced data analytics.
Special care	A designation given to residents receiving complex clinical care or with serious medical conditions such as multiple sclerosis, quadriplegia, cerebral palsy, respiratory therapy, ulcers, stage III or IV pressure ulcers, radiation, surgical wounds or open lesions, tube feeding and aphasia, fever with dehydration, pneumonia, vomiting, weight loss or tube feeding.
Stroke	Occurs when a vessel in the brain ruptures or is blocked by a blood clot.
TIA	Transient ischemic attack, or 'mini-stroke'; an episode of temporary and focal cerebral dysfunction of vascular origin, variable in duration, commonly lasting from 2 to 15 minutes but occasionally as long as a day (24 hours); leaves no persistent neurological deficit (from www.strokebestpractices.ca).

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