Ontario

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Stroke and Transient Ischemic Attack (TIA)

Brain Health in Ontario Project

ONTARIO BRAIN INSTITUTE
INSTITUT ONTARIEN DU CERVEAU

WELCOME TO BRAIN CENTRAL

Stroke and transient ischemic attack (TIA)

- A stroke is a sudden brain injury caused by the interruption of blood flow to or sudden bleeding into a part of the brain. Broadly, there are two types of strokes: ischemic (85%) and hemorrhagic (15%).

- An ischemic stroke is caused by interruption in blood flow due to sudden blockage of a brain artery. A hemorrhagic stroke is caused by rupture of a brain artery leading to bleeding into the brain or into the spaces around the brain. Interruption of normal blood flow prevents the brain from receiving adequate nutrients (e.g., glucose and oxygen) necessary for survival. Bleeding into the brain causes compression and damage from swelling. Stroke results in permanent death of one region of the brain – it is a form of permanent brain damage.

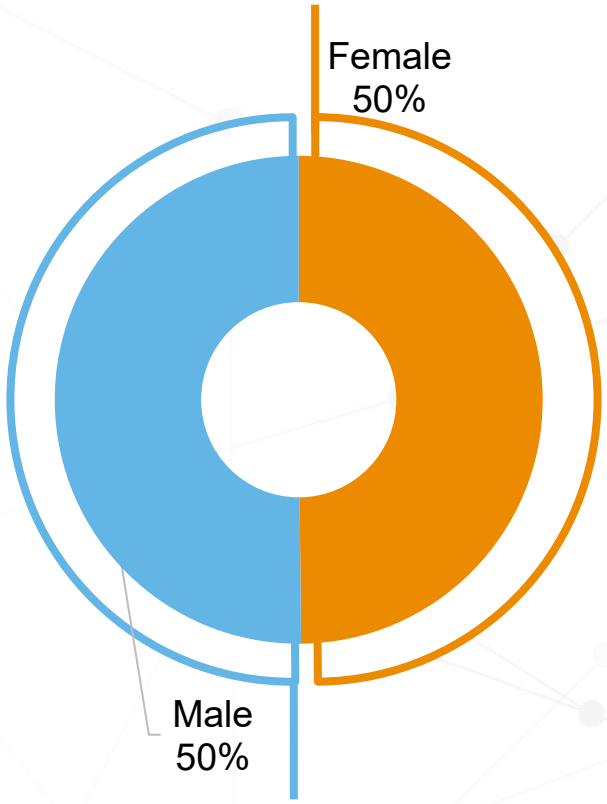
- The effects of a stroke depend on the location and severity of damage. Most commonly, a stroke is associated with weakness on one side of body, difficulty with speech or understanding speech and loss of vision. Stroke can also result in cognitive difficulty, loss of sensation or imbalance.

- A transient ischemic attack is the mildest form of ischemic stroke. It is a short-lived stroke lasting typically less than 30 minutes. A transient ischemic attack is often a warning sign for a future major ischemic stroke.

- A stroke can be a life-altering event, or a fatal event. In Canada, approximately one in six patients with stroke will die in the first 30 days. Stroke survivors may face great limitation in ability, necessitating alternate methods and assistance for carrying out everyday activities. It is common for older adults who have suffered stroke to require long-term care. However, almost every stroke survivor can recover some function. Treatments for acute ischemic stroke vary, but include: clot-busting drugs or advanced endovascular treatment in appropriately selected patients. In order to improve functional recovery, patients may be offered physiotherapy, occupational therapy, speech-language therapy and adjusted living (in the case of paralysis).

- The best treatment for stroke is prevention. The likelihood of having a stroke can be greatly reduced by controlling blood pressure. Other modifiable risk factors for stroke include smoking, high alcohol intake, poor diet, high cholesterol and substance abuse. It is important to concurrently maximize physical activity, healthy diet and good sleeping habits.

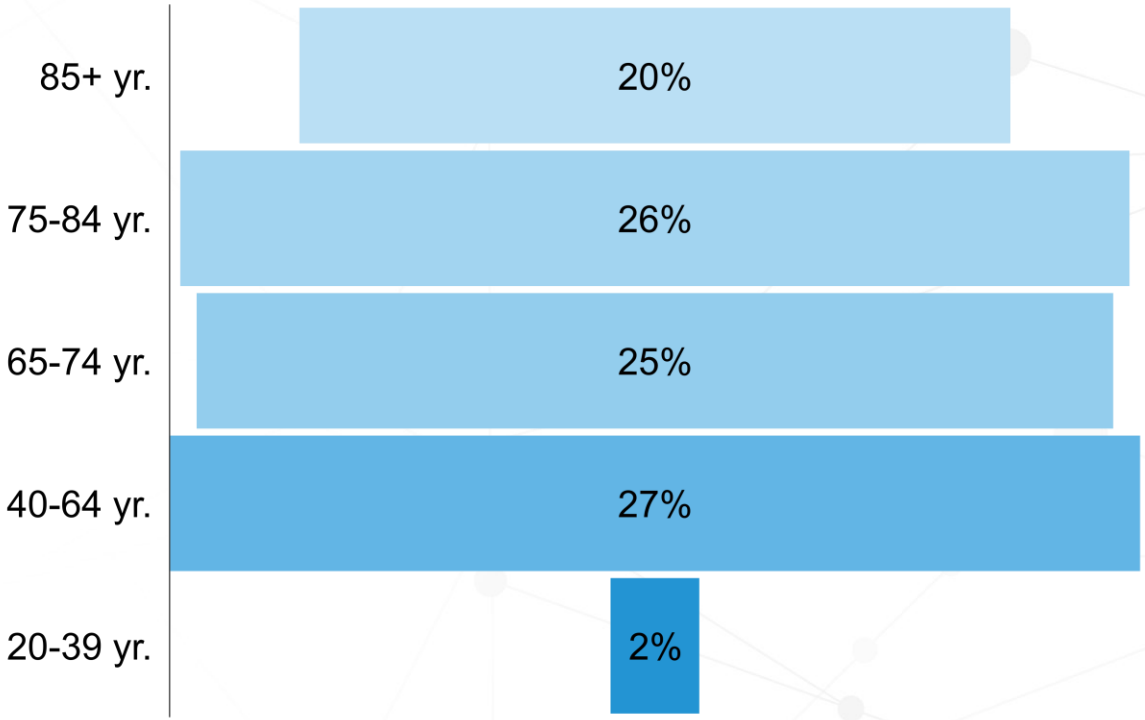
Demographics: Sex distribution



On April 1, 2019 males accounted for 50% of the 367,858 Ontarians identified with stroke or TIA.

*Note, years represent the fiscal year. For example, 2019 is from April 1, 2019 to March 31, 2020.

Demographics: Age distribution



On April 1, 2019 98% of people having had a stoke or TIA were over the age of 40. The mean age of a person who has had a stoke or TIA in the past was 72 ± 14 years.

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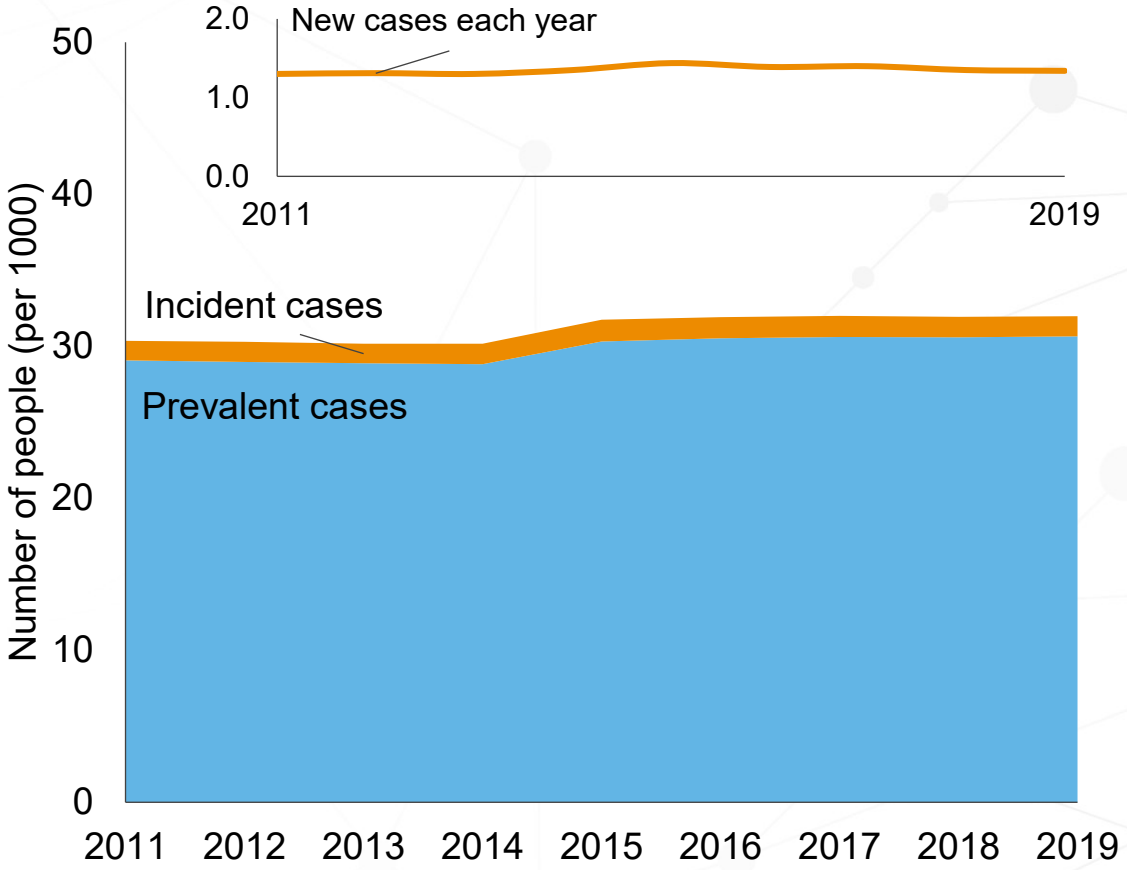
Prevalence and incidence over time



Incidence is the number of people newly diagnosed with a disorder within a given time period while prevalence is the number of people existing with the disorder at a given time.

The incidence and prevalence of Ontarians with stoke or TIA are depicted in orange and blue, respectively. Between 2011 and 2019, incidence changed from 1.3 to 1.34 per 1000 people and prevalence increased from 29.06 to 30.64 per 1000 people.

In total, the number of people with stroke or TIA increased from 295,149 in 2011 to 367,858 people in 2019.

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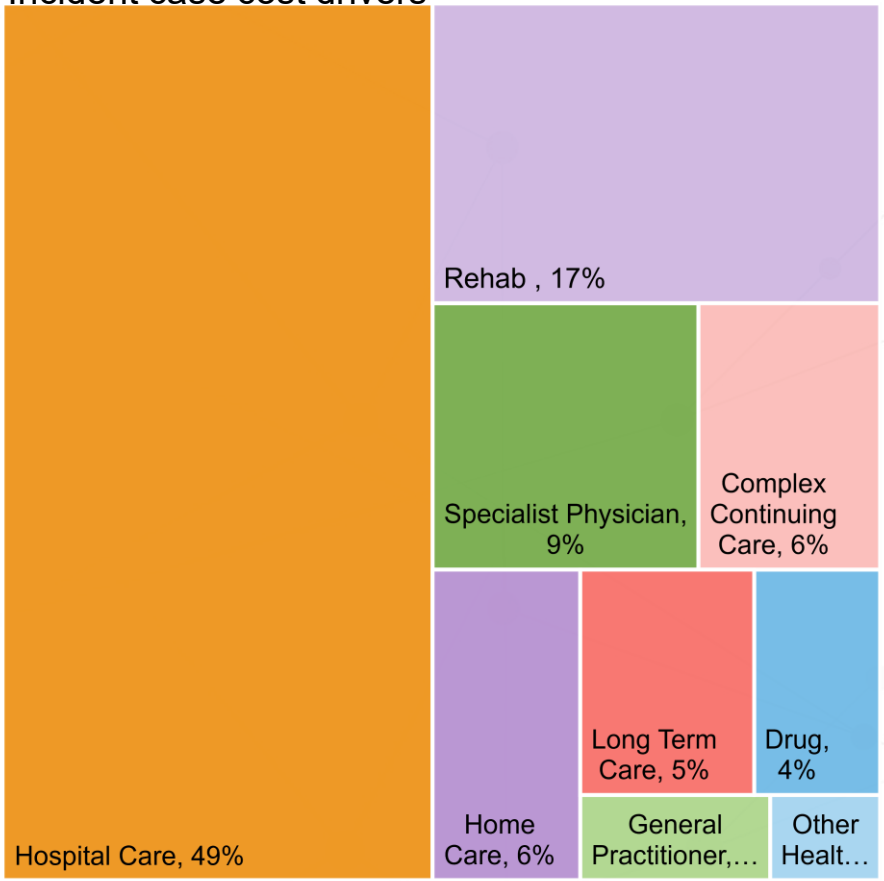
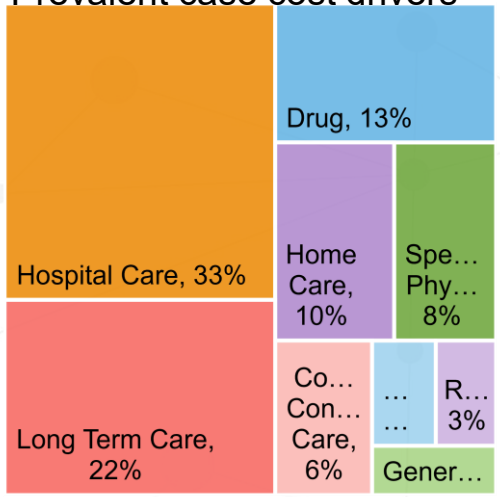
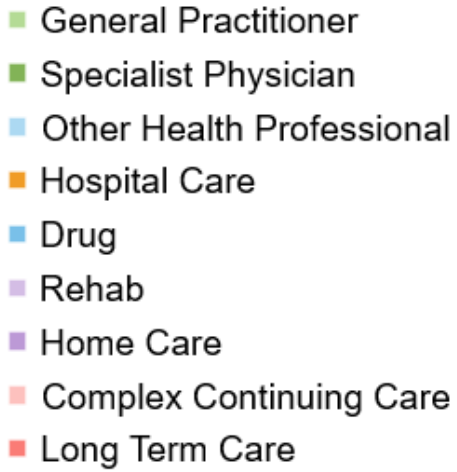
Cost Drivers: Incident vs. prevalent

Incident case cost drivers



Prevalent case cost drivers





*Cost drivers examined include: Hospital care, home care, general practitioner, specialist physician, other health professional, drug cost, rehab, complex continuing care, and long term care.

Cost Drivers: Incident vs. prevalent

In 2019, the average total cost to the health system for an Ontarian with stroke or TIA was 3X more for an incident case than a prevalent case. Cost relationship is indicated by total box size. The largest cost driver of incident cases was attributable to hospital care (49%) followed by rehab (17%), while hospital care (33%) and long term care (22%) had the highest costs for prevalent cases.

The average total health care costs for a person with stroke or TIA (prevalent case) for 1 year are 5X higher for adults and 2X higher for seniors compared to the average Ontarian.

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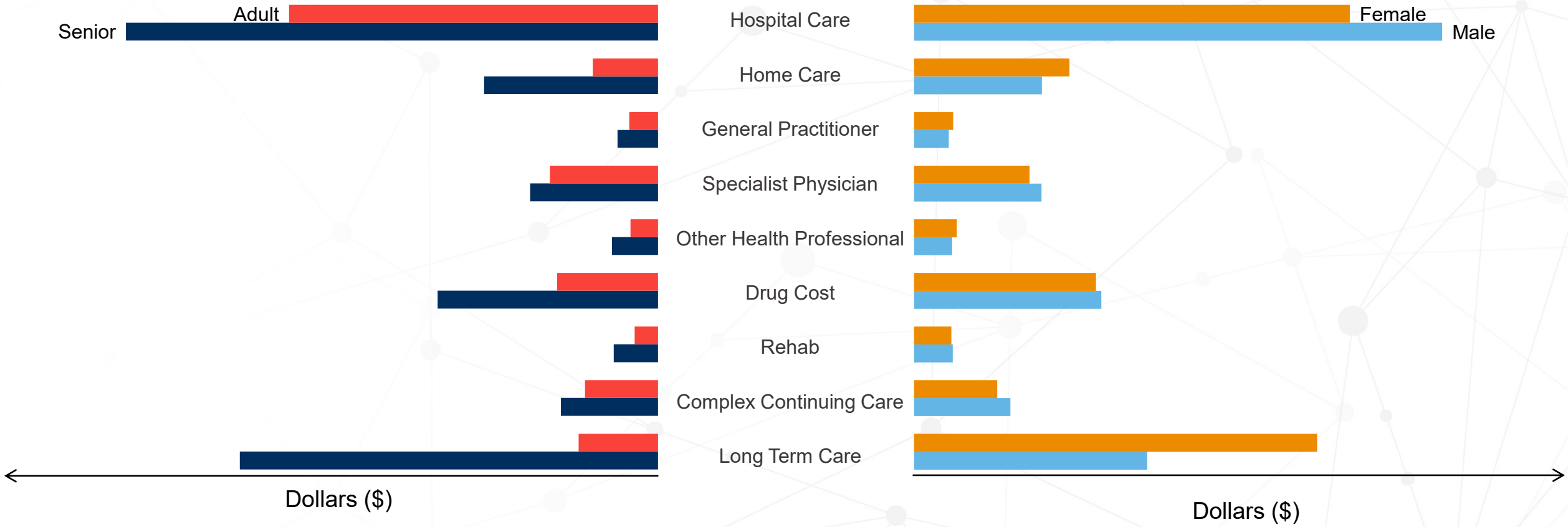
*Cost drivers examined include: Hospital care, home care, general practitioner, specialist physician, other health professional, drug cost, rehab, complex continuing care, and long term care.

Cost Drivers vary by age and sex for prevalent cases



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Cost Drivers vary by age and sex for prevalent cases

Overall, health care costs (in Canadian dollars, 2019) for people with a stroke or TIA are higher for the senior (65+ years) population compared to adults (20 - 64 years) and are also higher for females than males. The cost drivers, those services that drive health care costs, vary depending on age and sex. Amongst adults, hospital care accounts for the largest cost driver at 42% of all costs, while hospital care and long term care drives costs in the senior population at 31% and 25% respectively. Hospital care is the largest cost driver in both females and males representing 29% and 37% of the health care costs respectively.

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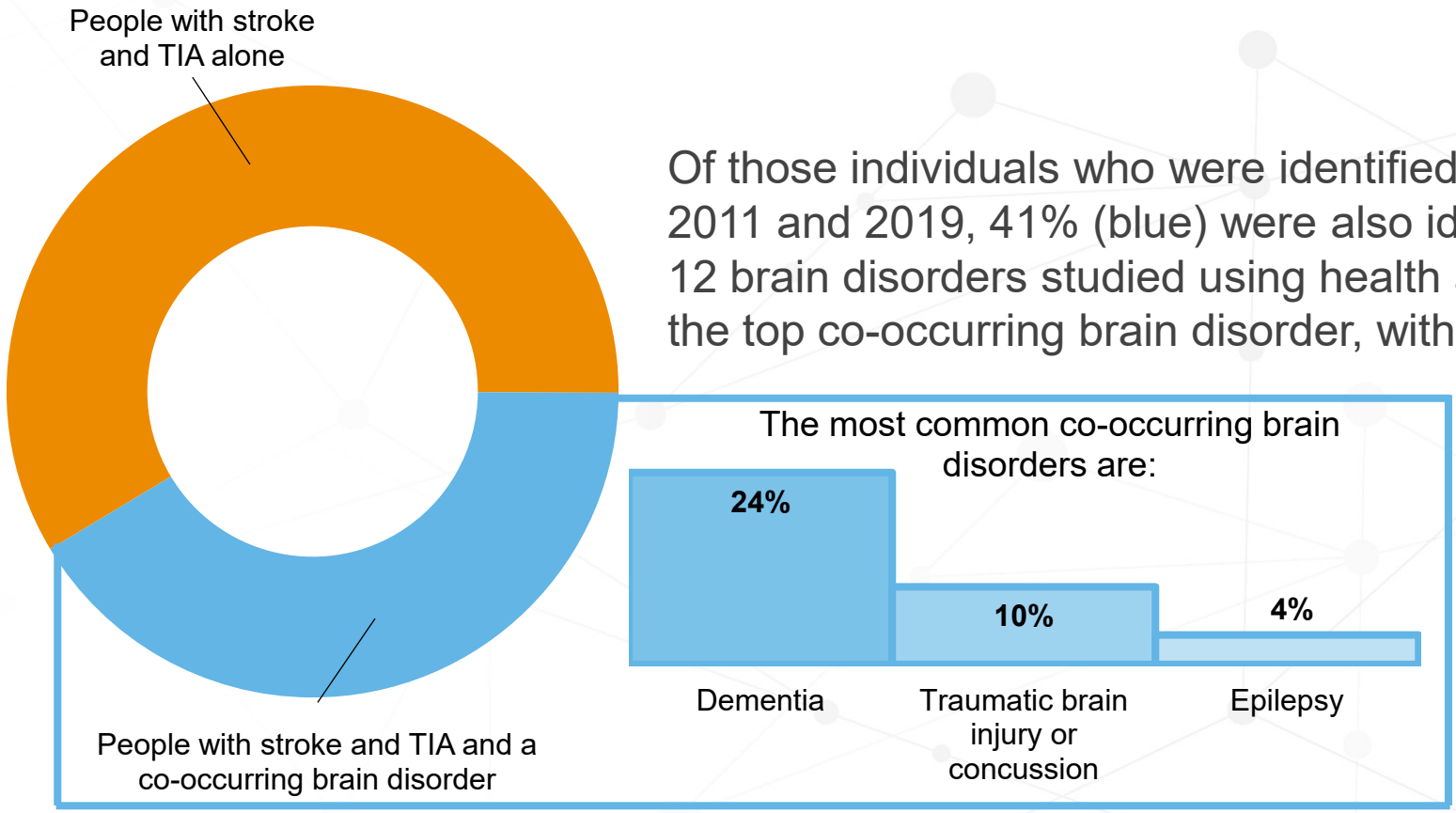
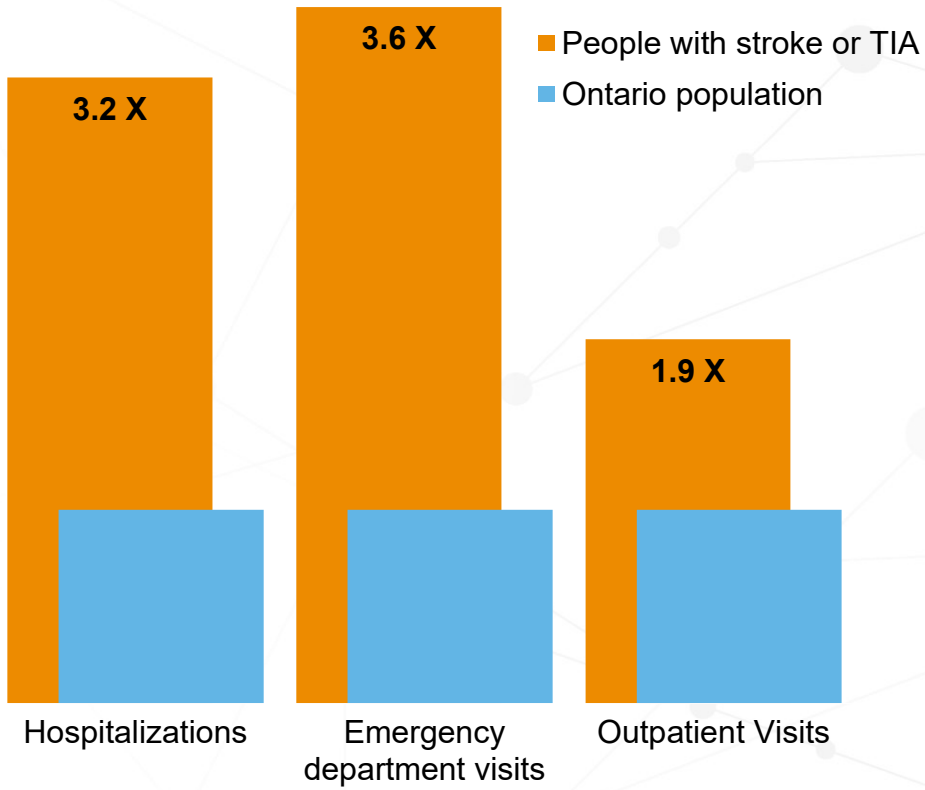
Co-occurring brain disorders



Of those individuals who were identified as having a stroke or TIA between 2011 and 2019, 41% (blue) were also identified as having one of the other 12 brain disorders studied using health administrative data. Dementia was the top co-occurring brain disorder, with 24% of those with stroke or TIA also having dementia, followed by 10% with a traumatic brain injury or concussion, and 4% with epilepsy.

*Note, years represent the fiscal year. For example, 2019 is from April 1, 2019 to March 31, 2020.
*Note, other brain disorders studied include: non-malignant brain tumour, benign brain tumour, dementia (incl. Alzheimer's disease), epilepsy, motor neuron disease, multiple sclerosis, parkinsonism, schizophrenia, spina bifida, spinal cord injury, stroke, and traumatic brain injury & concussion.

Mental Health and addictions service use



Of those individuals who were identified as having a stroke or TIA in 2019, their visit rates for mental health and addictions related services were between 1.9X to 3.6X greater than the general Ontario population, depending on visit type.

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Additional study information

Brain Disorder	Evidence Grade	Reference	Algorithm	ICD-09 (CM) codes	ICD-10 codes	OHIP Dx codes	ODB drugs name	OMHRS codes	Age Restriction
Stroke and transient ischemic attack	I	Validated algorithm	Incidence: 1 hospitalization record Prevalence: 1 hospitalization record or 2 physician claim records in a 1-year period	362.3, 430, 431, 434.0, 434.1, 434.9, 435.0, 435.1, 435.2, 435.3, 435.8, 435.9,, 436	G45.0, G45.1, G45.2, G45.3, G45.8, G45.9, H34.0, H34.1, I60, I61 (except I61.7), I63.0, I63.1, I63.2, I63.3, I63.4, I63.5, I63.8, I63.9, I64	435, 436, 432	N/A	N/A	20 years and older

Brain health in Ontario project main page: www.braininstitute.ca/BrainHealth
Methods and Considerations: www.braininstitute.ca/brainhealth-methodology

Publication information