

# Cerebral Palsy

Brain Health in Ontario Project



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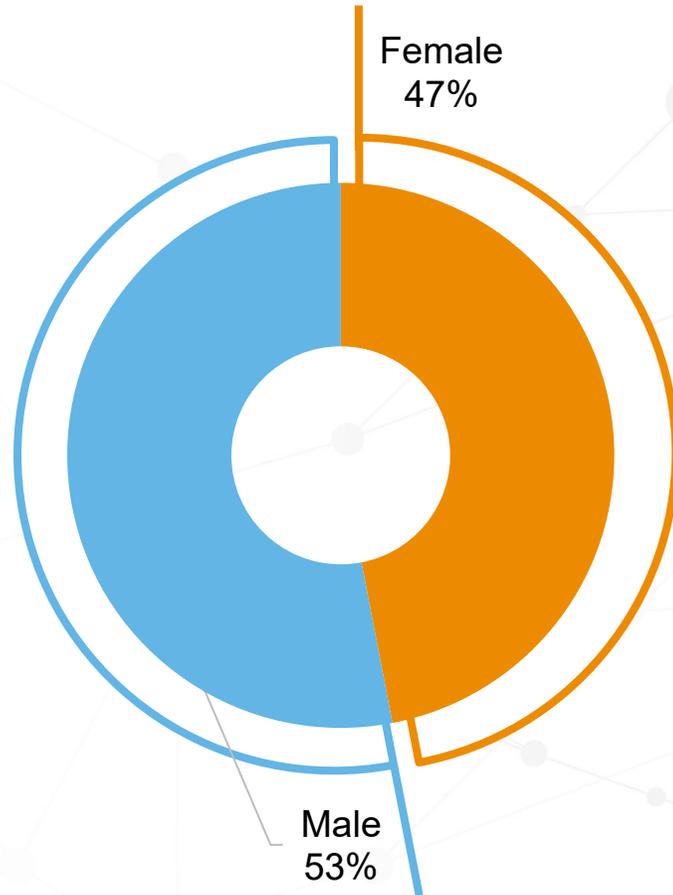
WELCOME TO BRAIN CENTRAL



# Cerebral Palsy

- Cerebral palsy describes a motor neuron disorder that arises as a result of an injury to the developing brain. Cerebral palsy is characterized by dysfunction in movement and posture that limits activities. The injury can occur before, during or after birth (usually before two years of age). There are many risk factors for cerebral palsy including being born prematurely, having a stroke, and being exposed to infections. Cerebral palsy is a chronic condition.
- The consensus definition of cerebral palsy includes motor impairment and the frequent co-occurrence of other challenges. These include seizures, as well as impairments in cognitive ability and senses (impaired vision, hearing and abnormal pain), which can contribute to the overall health burden on the child and family. The symptoms of cerebral palsy vary greatly in type and severity.
- Early diagnosis of cerebral palsy is crucial as although the brain injury underlying cerebral palsy does not change over time, related health complications can cause further harm. Drugs and surgery can lessen muscle stiffness and help with musculoskeletal abnormalities; in addition, physiotherapy can play a critical role in helping to maximize motor function.
- Individuals with cerebral palsy engage with an interprofessional health team including developmental paediatricians, neurologists, surgeons, physical and occupational therapists, speech-language pathologists, social workers, special education teachers and many others to assist in overcoming everyday hurdles.
- Cerebral palsy is not a barrier to living a full and satisfying life. Rather, challenges are often a result of external factors such as inaccessible buildings and transportation, negative societal attitudes, and exclusion from education, recreation, and employment opportunities.

# Demographics: Sex distribution

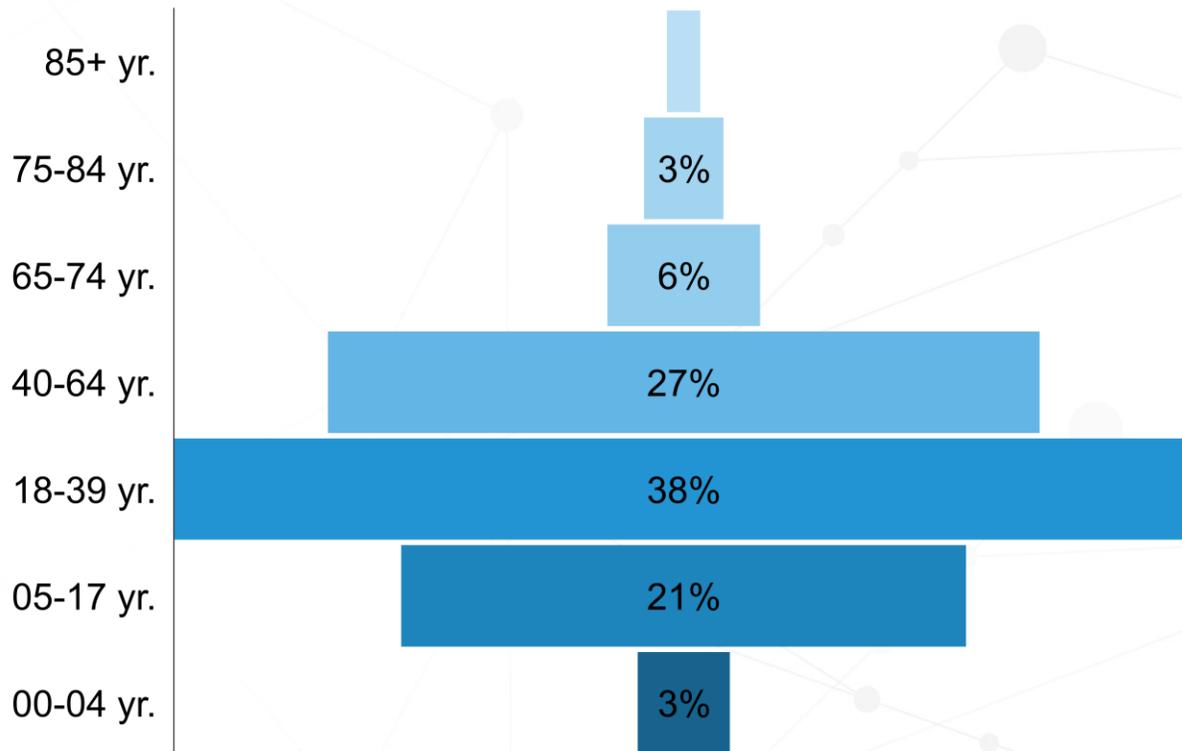


On April 1, 2019 males accounted for 53% of the 46,732 Ontarians identified with cerebral palsy.

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



# Demographics: Age distribution

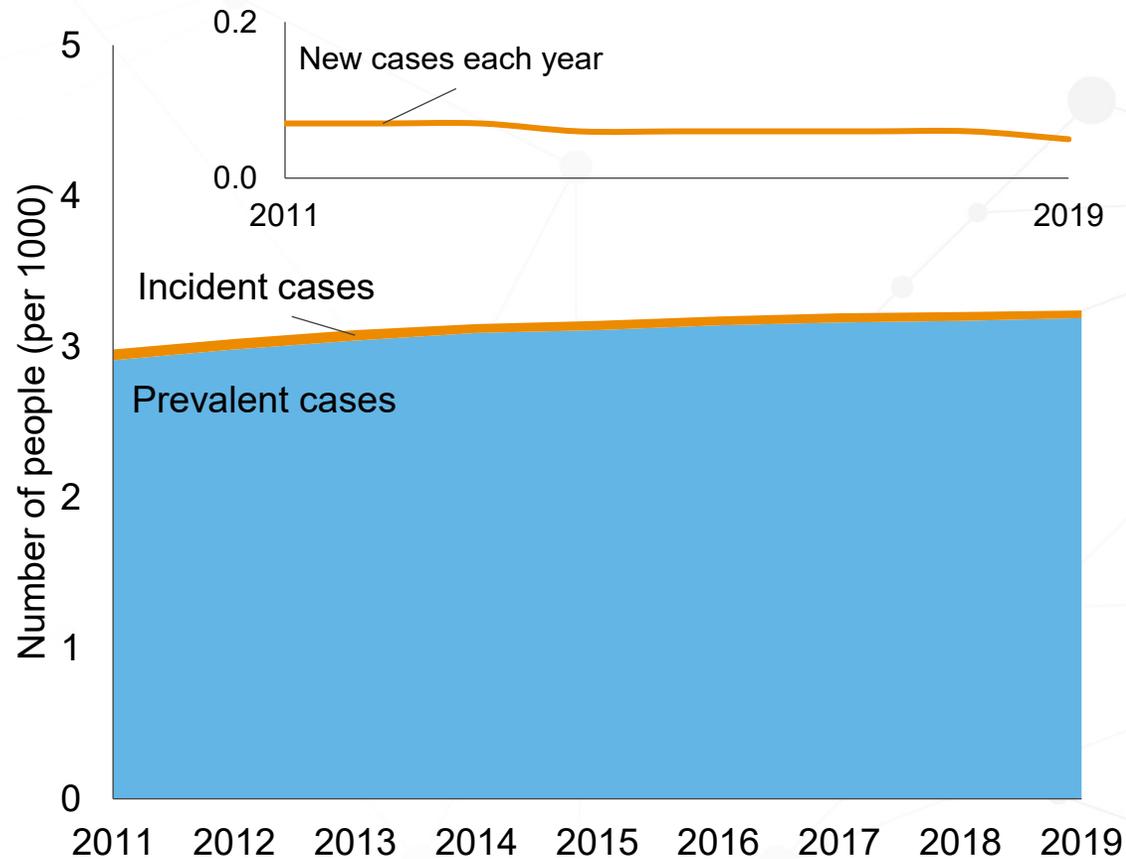


On April 1, 2019 the majority of people with cerebral palsy were between the ages of 18 and 39 years, with 89% of people being under the age of 65. The mean age of a person with cerebral palsy was  $35 \pm 21$  years.

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



# 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 cerebral palsy are depicted in orange and blue, respectively. Between 2011 and 2019, incidence changed from 0.07 to 0.05 per 1000 people and prevalence increased from 2.91 to 3.19 per 1000 people.

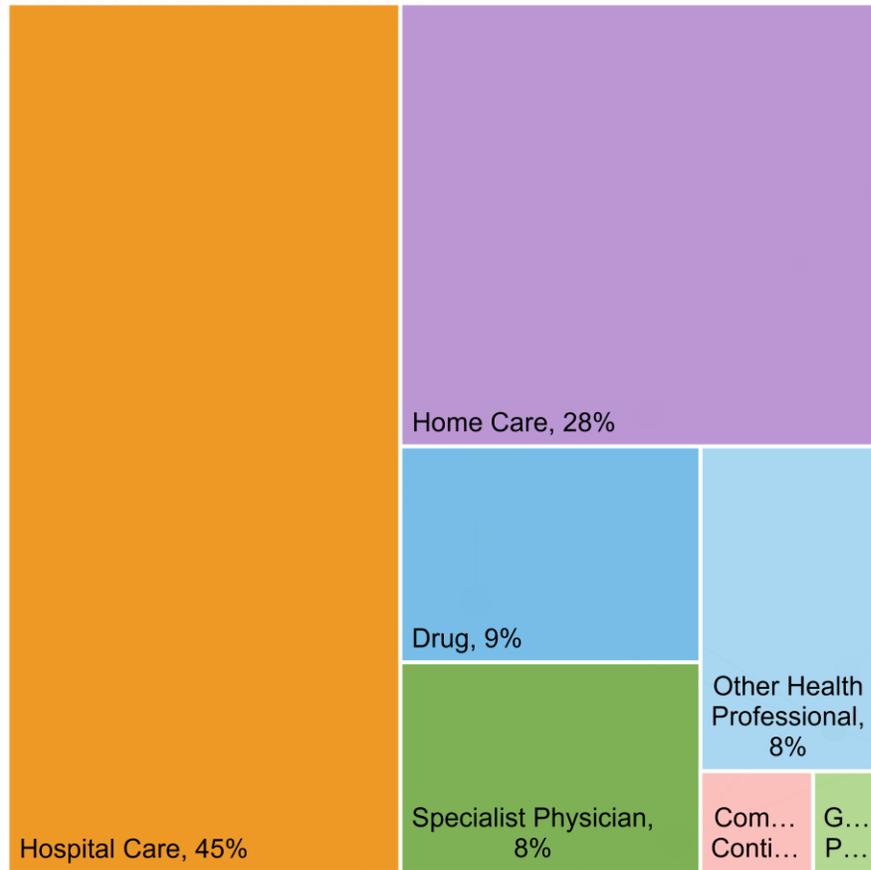
In total, the number of people with cerebral palsy increased from 38,743 in 2011 to 46,732 people in 2019.

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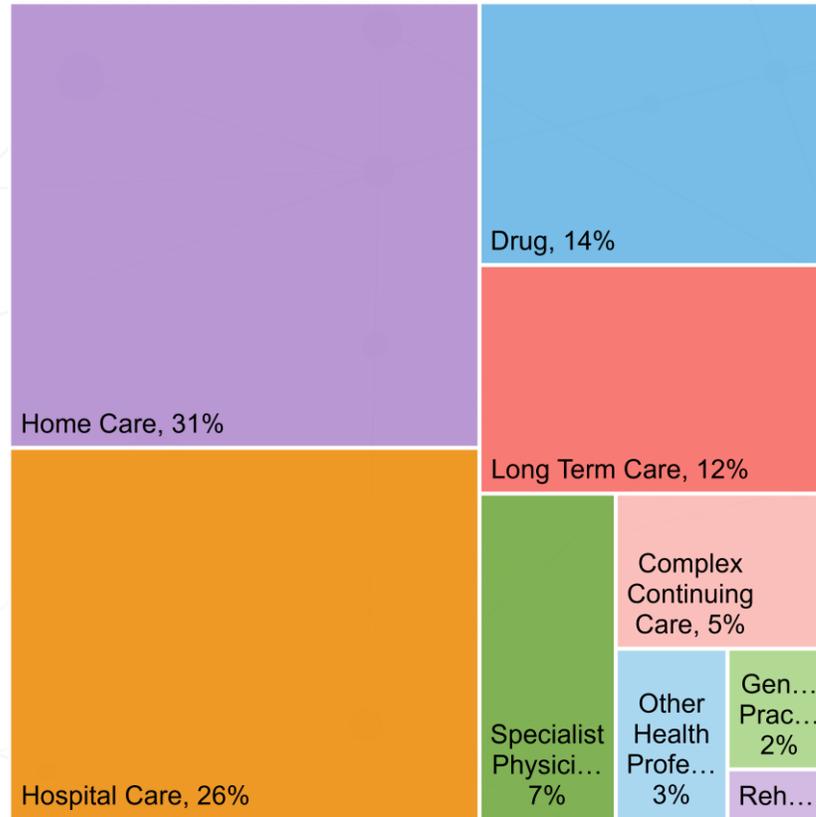


# Cost Drivers: Incident vs. prevalent

Incident case cost drivers



Prevalent case cost drivers



- General Practitioner
- Specialist Physician
- Other Health Professional
- Hospital Care
- Drug
- Rehab
- Home Care
- Complex Continuing Care
- Long Term Care

\*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 cerebral palsy was 1.1X 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 (45%), while home care (31%) and hospital care (26%) had the highest costs for prevalent cases.

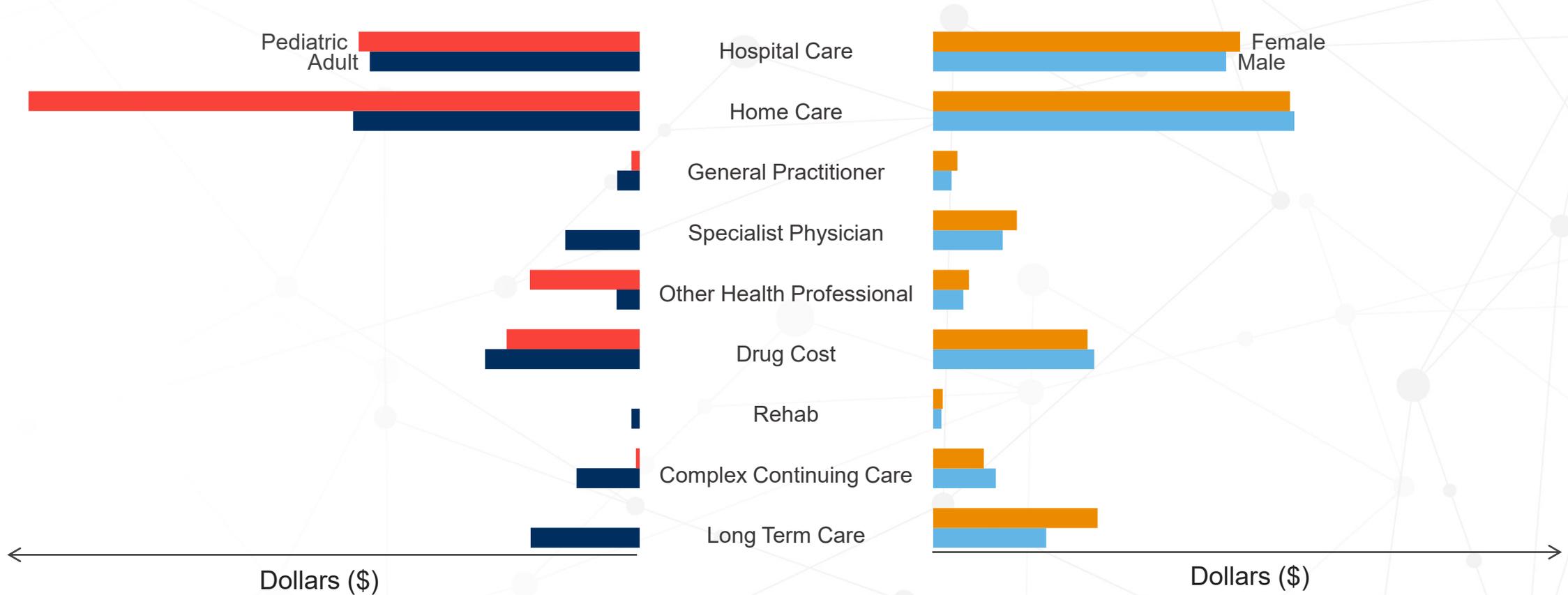
The average total health care costs for a person with cerebral palsy (prevalent case) for 1 year are 5X higher for adults (18 – 64 years) and 15X higher for pediatric individuals (0 – 17 years) compared to the average Ontarian.

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

\*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

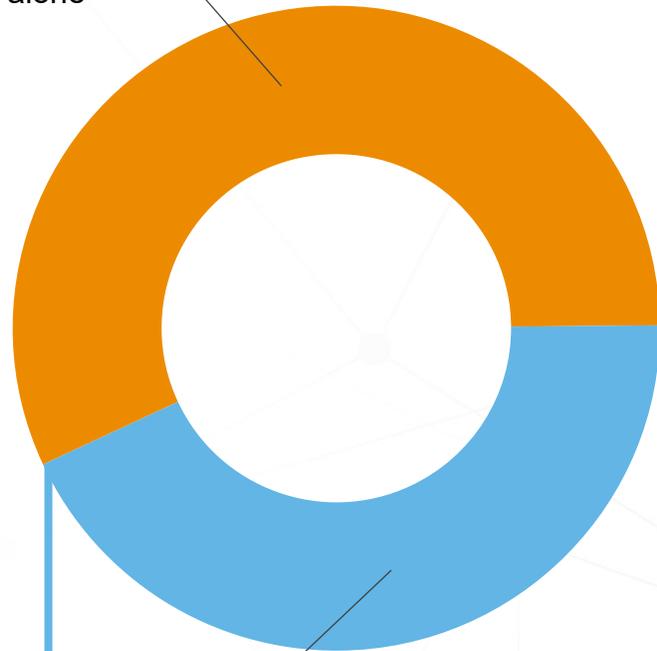
Overall, health care costs (in Canadian dollars, 2019) for people with cerebral palsy are higher for the pediatric (0 - 17 years) population compared to adults (18 - 64 years) and are also higher for females than males. The cost drivers, those services that drive health care costs, vary depending on age and sex. Amongst pediatric individuals, home care accounts for the largest cost driver at 53% of all costs, while home care and hospital care drives costs in the adult population at 28% and 27% respectively. Home care is the largest cost driver in both females and males representing 30% and 32% of the health care costs respectively.

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# Co-occurring brain disorders

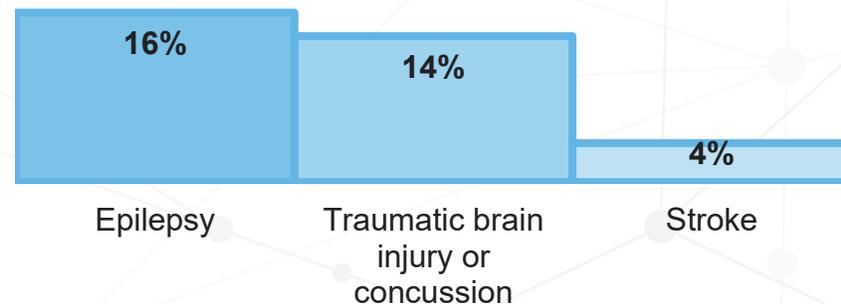
People with cerebral palsy alone



People with cerebral palsy and a co-occurring brain disorder

Of those individuals who were identified as having cerebral palsy between 2011 and 2019, 43% (blue) were also identified as having one of the other 12 brain disorders studied using health administrative data. Epilepsy was the top co-occurring brain disorder, with 16% of those with cerebral palsy also having epilepsy, followed by 14% with a traumatic brain injury or concussion, and 4% having had a stroke.

The most common co-occurring brain disorders are:

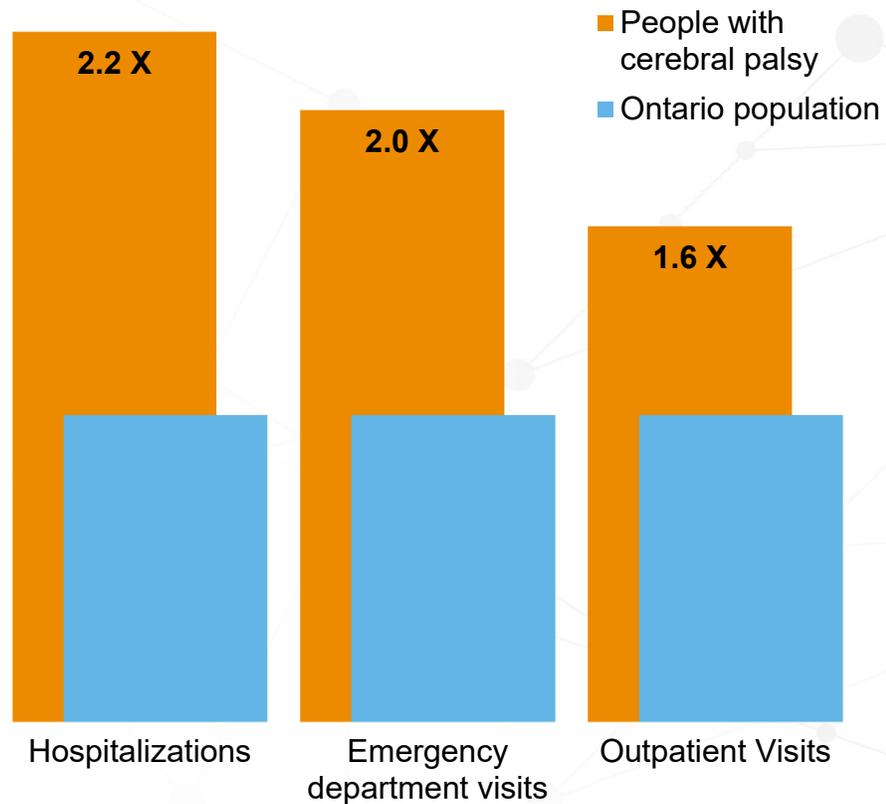


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\*Note, other brain disorders studied include: non-malignant brain tumour, benign brain tumour, dementia (incl. Alzheimer's disease), epilepsy, motor neuron disease, multiple sclerosis, parkinsonism, schizophrenia, spina bifida, spinal cord injury, stroke, and traumatic brain injury & concussion.



# Mental Health and addictions service use



Of those individuals who were identified as having cerebral palsy in 2019, their visit rates for mental health and addictions related services were between 1.6X to 2.2X 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
Cerebral palsy	II	Accepted algorithm. Available at: <a href="https://doi.org/10.24095/hpcdp.40.2.01">https://doi.org/10.24095/hpcdp.40.2.01</a>	1 hospitalization record <u>or</u> 1 physician claim record	343	G80	343	N/A	N/A	For incidence: Birth to 20 years of age. After 20 years: incidence = 0

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



# Publication information

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