

## Evidence for Planning

### Cerebral Palsy in British Columbia

Cerebral palsy (CP) is defined as “a group of permanent disorders of the development of movement and posture causing activity limitation, that are attributed to non-progressive disturbances that occurred in the developing foetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication and behaviour, by epilepsy, and by secondary musculoskeletal problems.”<sup>1,pg. 9</sup> Cerebral palsy is considered to be one of the most severe disabilities in childhood, impacting 2 to 3 of every 1000 live births.<sup>2</sup> A recent Canadian study confirmed that the prevalence of CP in British Columbia is 2.68 per 1000 live births with no statistically significant differences between health regions.<sup>3</sup>

Unfortunately, unlike in many regions of the world including Australia, Ireland, Norway and Sweden, there is no central registry in British Columbia that tracks information regarding CP, nor data regarding the level function or type of CP that individuals are affected by. The best estimates that can be made are by extrapolation from overall population statistics, although admittedly this comes with many limitations. According to the 2008 population estimates by BC STATS, 973603 children live in BC.<sup>4</sup> Using a prevalence rate of 2.68 per 1000 live births,<sup>3</sup> we can therefore estimate that there are approximately 2600 children 0 to 19 years of age with CP currently living in BC. More specifically, approximately 700 of 258145 children 5 years of age and under have CP and approximately 1900 of 715458 children 6 to 19 years of age have CP. Table 1 further estimates the number of children with CP in each BC health region by age group. All estimates included in this document have been rounded to the nearest 100 and may therefore have lead to total scores that do not exactly add up to the sum of the individual calculations.

**Table 1: Estimated Number of Children with CP in BC by Health Region**

	Interior	Fraser	Vancouver Coastal	Vancouver Island	Northern	Total
5 years of age and under	100	300	200	100	100	Approx. 700
6 to 19 years of age	300	700	400	300	200	Approx. 1900
Total	Approx. 400	Approx. 1000	Approx. 600	Approx. 400	Approx. 200	Approx. 2600

Since the term CP includes a wide range of disability, it is important when attempting to describe a group of individuals who are affected by CP to know the level of motor function, limb distribution, and type of motor involvement. The Gross Motor Function Classification System (GMFCS) is a motor scale that measures function in CP and describes five levels of gross motor function.<sup>5</sup> Level I describes the most able and level V describes those most limited in terms of functional mobility.<sup>5</sup> The distribution of GMFCS levels within a population has been reported in the international literature. Table 2 illustrates the distribution of GMFCS levels in five different populations.<sup>6-10</sup>

**Table 2: GMFCS Level Distribution in Five Countries**

GMFCS Level	Canada (Ontario) <sup>6</sup> (n= 657; Age= 1-13 years) (%)	Northern Ireland <sup>7</sup> (n= 1342; Age= 4-19 years) (%)	Australia (Victoria) <sup>8</sup> (n= 323; Age= 2-12 years) (%)	Southern Sweden <sup>9</sup> (n= 343; Age= 4-11 years) (%)	Norway <sup>10</sup> (n=289; Age= 1-10 years) (%)
I	28	14	35	48	55
II	12	44	16	18	
III	19	11	14	12	17
IV	21	7	16	9	20
V	21	21	18	13	8

As can be seen in Table 2, the distribution of GMFCS levels is variable between countries and may also be variable within a country. The distribution of types of CP in BC can therefore at best only be grossly estimated. Table 3 uses the percentages listed in Table 2 to estimate the proportion of BC children whose functional mobility would be classified as GMFCS level I to V.

**Table 3: Estimated GMFCS Distribution of British Columbian Children with CP**

GMFCS Level	BC Estimate Based on Ontario Study <sup>6</sup>	BC Estimate Based on Range in Five Studies <sup>6-10</sup>
I	700 (28%)	400-1200 (14-48%)
II	300 (12%)	300-1100 (12-44%)
III	500 (18%)	300-500 (11-19%)
IV	500 (21%)	500-800 (7-21%)
V	500 (21%)	200-500 (8-21%)
Total	Approximately 2600	Approximately 2600

CP can also be classified according to limb distribution. Table 4 illustrates the prevalence of three groupings of limb distribution in samples described in the literature. Data from Northern Ireland<sup>6</sup> and Norway<sup>10</sup> were not available.

**Table 4: CP Limb Distribution in Three Countries**

Limb Distribution	Canada (Ontario) <sup>6</sup> (%)	Australia <sup>8</sup> (%)	Sweden <sup>9</sup> (%)
Hemiplegia	15	35	30
Diplegia	33	28	42
Tri/Quadriplegia	50	37	6
Other	2	0	22

Using these numbers, the prevalence of different limb distribution groupings can be grossly estimated for BC. Table 5 summarises these estimated results.

**Table 5: Estimated Limb Distribution of British Columbian Children with CP**

Limb Distribution	BC Estimate Based on Ontario Study <sup>6</sup>	BC Estimate Based on Range in Three Studies <sup>6,8,9</sup>
Hemiplegia	400 (15%)	400-800 (15-30%)
Diplegia	900 (33%)	700-1100 (28-42%)
Tri/Quadriplegia	1300 (50%)	200-1300 (6-50%)
Other	100 (2%)	0-600 (0-22%)
Total	Approximately 2600	Approximately 2600

Lastly, CP is also classified according to motor type. Table 6 summarises the prevalence of the different motor types in the samples in the literature. Data from Ontario<sup>6</sup> and Northern Ireland<sup>7</sup> were not available.

**Table 6: CP Motor Type Distribution in Three Countries**

Motor Type	Australia <sup>8</sup> (%)	Sweden <sup>9</sup> (%)	Norway <sup>10</sup> (%)
Spastic	86	73.5	82
Dystonic	2	11	6
Choreo-athetoid	0	5.5	0
Mixed	7	0.5	7
Ataxic	3	11	5
Hypotonic	3	0	0

These numbers can be used to grossly estimate the presence of each motor type in individuals with CP living in BC. Table 7 summarises these estimates.

**Table 7: Estimated Motor Type Distribution of British Columbian Children with CP**

Motor Type	BC Estimate Based on Range in Three Samples <sup>8-10</sup>
Spastic	1900-2200 (73.5-86%)
Dystonic	100-300 (2-11%)
Choreo-athetoid	0-100 (0-5.5%)
Mixed	0-500 (0.5-7%)
Ataxic	100-300 (3-11%)
Hypotonic	0-100 (0-3%)
Total	Approximately 2600

Unlike in many countries or even Canadian provinces such as Quebec, there is no current method of tracking CP in BC. Although the numbers provided above are only gross estimates, they illustrate that a large number of British Columbians are affected by CP and that their motor function, limb distribution, and type of motor involvement varies greatly.

*This summary was written by Tanja Mayson (MSc, BScPT), physiotherapist at the Sunny Hill Health Centre for Children, Vancouver, BC, on January 7<sup>th</sup>, 2010.*

## References

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