



Population Profile: Multiple Sclerosis

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Multiple sclerosis (MS) is a progressive chronic disease of the autoimmune system which affects the central nervous system, including the brain, spinal cord and optic nerves.¹ There are a number of different types of MS with varying symptoms and degrees of severity, including clinically isolated syndrome, relapsing remitting MS, primary progressive MS, secondary progressive MS, and progressive-relapsing MS.^{2,3} Symptoms of MS vary between individuals and can include extreme fatigue, as well as difficulties with vision, hearing, balance, and mobility.^{3,4}

Prevalence Rates

Worldwide, more than 2.3 million people have been diagnosed and are currently living with MS. The global prevalence rate indicates that there are 33 people living with MS per 100,000 people. The highest rates of MS are found in North America (140 per 100,000 people) and Europe (108 per 100,000 people).^{5,6} Canada has the highest rates in the world with approximately 100,000 Canadians currently living with the disease (Table 1).^{1,7,8}

Table 1: Global Prevalence Rates of MS

Global Prevalence Rates ^{5,6}	per 100,000 people
North America	140
<i>Canada (Highest Prevalence)</i>	291
<i>United States</i>	135
<i>Mexico (Lowest Prevalence)</i>	15
Europe	108
<i>Sweden (Highest Prevalence)</i>	189
<i>Albania (Lowest Prevalence)</i>	22

The Atlantic Partnership for Tomorrow’s Health (PATH) cohort study includes self-reported survey data for over 30,000 adult participants aged 35-69 from Nova Scotia, New Brunswick, Prince Edward Island, and Newfoundland and Labrador.^{9,10} The results of the Atlantic PATH study indicate that 185 participants have been diagnosed and are living with MS, which represents 0.6% of our participant population. The prevalence rate in Canada is 0.2% of the general population with 291 people living with MS per 100,000 people.⁶

Orton et al.¹¹ found that the female-to-male sex ratio increased in Canada over a period of 50 years (1931-1980) which is consistent with an increase in both the incidence and prevalence of MS.^{5,6,11} Globally, women are at least twice as likely to be diagnosed with MS compared to men.¹¹⁻¹⁵ However, Atlantic PATH participants with MS were more than four times likely to be women (Table 2).

Table 2: Prevalence Rates of MS among Atlantic Path Participants

Atlantic PATH Participants	Prevalence Rates n (%)
Women	149/21735 (0.68)
Men	36/9438 (0.38)
Total	185/31173 (0.59)

Profile of Atlantic PATH Participants

The majority of people are diagnosed with MS between the ages of 15 and 40, although it is also diagnosed in younger children and older adults.¹ Atlantic PATH participants were diagnosed between the ages of 18 and 60, with an average age of 38 at diagnosis. They have been living with MS for an average of 20 years since diagnosis, with a range of 5 to 45 years.

Health Status

A diagnosis of MS has an impact on quality of life with physical, emotional and financial implications for those living with the disease. While levels of disability vary among people with MS, up to 60% are no longer fully ambulatory within 20 years of onset.¹⁶

Atlantic PATH participants were asked to rank their perceived health status. The majority of participants with MS (42%) reported their health status to be “good,” whereas 44% of those without MS rated their health as “very good.” Twenty-eight percent of participants with MS describe their health as “very good,” 21% as “fair,” and 7% as “excellent.” Only 3% perceived their health to be “poor” (Table 3).

Table 3: Perceived Health Status

Perceived Health Status	Participants with MS n (%)	Participants without MS n (%)
Excellent	12 (6.6)	5288 (17.3)
Very Good	52 (28.4)	13,496 (44.2)
Good	76 (41.5)	9401 (30.8)
Fair	38 (20.8)	2020 (6.6)
Poor	5 (2.7)	313 (1.0)

Employment

While the majority of Atlantic PATH participants with MS were working full-time (48%), this rate was significantly less than the 60% of participants without MS who reported working full-time. There was also a striking difference between those with MS who are unable to work because of illness or disability (23%) and those without MS (3%). An additional 22% of participants with MS were retired (Table 4).

Table 4: Working Status

Working Status	Participants with MS n (%)	Participants without MS n (%)
Full-Time Employment/Self-Employed	88 (47.8)	18,249 (59.9)
Part-Time Employment/Self-Employed	10 (5.4)	3171 (10.4)
Retired	40 (21.7)	6196 (20.3)
Looking after Home and/or Family	5 (2.7)	1245 (4.1)
Unable to work because of disability or illness	42 (22.8)	945 (3.1)
Unemployed	1 (0.5)	670 (2.2)
Unpaid or Voluntary Work	7 (3.8)	725 (2.4)
Student	0 (0.0)	217 (0.7)

Depression and Anxiety

Research suggests that people with MS experience high rates of anxiety and depression.¹⁷⁻¹⁹ While Atlantic PATH participants with MS demonstrate relatively low levels of depression and anxiety, they do experience high levels of fatigue, difficulty sleeping and difficulty relaxing. Fifty percent of participants experienced fatigue several days within the two weeks prior to completing the survey, while 6.5% experienced fatigue more than half of the time, and 19% experienced fatigue on a daily basis. Within the same two-week period, 43% of participants had difficulty relaxing and 55% had difficulty sleeping (Table 5, 6).

Table 5: Depression and Anxiety Indicators among Participants with MS

Depression and Anxiety Indicators* among participants with MS	Not at All n (%)	Several Days n (%)	More than Half n (%)	Nearly Every Day n (%)
Little interest in doing things	87 (71.3)	29 (23.8)	4 (3.3)	2 (1.6)
Lacking self-confidence	100 (82.6)	18 (14.9)	1 (0.8)	2 (1.7)
Suicidal thoughts	120 (98.4)	1 (0.8)	0 (0)	1 (0.8)
Difficulty concentrating	93 (75.6)	21 (17.1)	5 (4.1)	4 (3.3)
Difficulty sleeping	55 (45.5)	38 (31.4)	10 (8.3)	18 (14.9)
Moving or speaking slowly or quickly	102 (84.3)	12 (9.9)	5 (4.1)	2 (1.7)
Fatigue	31 (25.2)	61 (49.6)	8 (6.5)	23 (18.7)
Feeling depressed	92 (75.4)	27 (22.1)	1 (0.8)	2 (1.6)
Poor appetite or overeating	83 (68.6)	31 (25.6)	3 (2.5)	4 (3.3)
Uncontrolled worrying	92 (74.8)	28 (22.8)	1 (0.8)	2 (1.6)
Chronic worrying	75 (61.5)	42 (34.4)	2 (1.6)	3 (2.5)
Easily irritated or annoyed	76 (62.3)	38 (31.2)	4 (3.3)	4 (3.3)
Nervous or anxious	81 (66.4)	36 (29.5)	3 (2.5)	2 (1.6)
Difficulty relaxing	70 (57.4)	43 (35.3)	2 (1.6)	7 (5.7)
Fear	102 (84.3)	16 (13.2)	1 (0.8)	2 (1.7)
Restlessness	99 (81.1)	16 (13.1)	2 (1.6)	5 (4.1)

*Questions related to the past two weeks prior to the questionnaire being completed.

Table 6: Depression and Anxiety Indicators among Participants without MS

Depression and Anxiety Indicators* among participants without MS	Not at All n (%)	Several Days n (%)	More than Half n (%)	Nearly Every Day n (%)
Little interest in doing things	15,947 (77.7)	3440 (16.8)	712 (3.5)	434 (2.1)
Lacking self-confidence	17,059 (82.6)	2661 (12.9)	516 (2.5)	419 (2.0)
Suicidal thoughts	20,232 (97.6)	379 (1.8)	68 (0.3)	53 (0.3)
Difficulty concentrating	17,249 (83.1)	2626 (12.6)	487 (2.3)	403 (1.9)
Difficulty sleeping	10,396 (50.2)	6514 (31.5)	1734 (8.4)	2045 (9.9)
Moving or speaking slowly or quickly	19,555 (94.2)	866 (4.2)	216 (1.0)	120 (0.6)
Fatigue	8703 (42.0)	8797 (42.5)	1761 (8.5)	1449 (7.0)
Feeling depressed	16,395 (79.8)	3334 (16.2)	529 (2.6)	289 (1.4)
Poor appetite or overeating	14,214 (69.2)	4310 (21.0)	1119 (5.4)	910 (4.4)
Uncontrolled worrying	15,858 (78.0)	3641 (17.9)	327 (1.6)	502 (2.5)
Chronic worrying	13,623 (67.1)	5650 (27.8)	415 (2.0)	604 (3.0)
Easily irritated or annoyed	13,246 (65.4)	6125 (30.2)	424 (2.1)	474 (2.3)
Nervous or anxious	14,672 (72.0)	5003 (24.5)	333 (1.6)	377 (1.8)
Difficulty relaxing	14,588 (72.1)	4705 (23.2)	408 (2.0)	541 (2.7)
Fear	17,789 (87.1)	2193 (10.7)	183 (0.9)	259 (1.3)
Restlessness	18,019 (88.1)	2032 (9.9)	177 (0.9)	216 (1.1)

*Questions related to the past two weeks prior to the questionnaire being completed.

Diet

A Healthy Eating Index (HEI) was developed for the Atlantic PATH participants who responded to comprehensive questions on food intake. The HEI was developed based on the methods recommended for Canadians and Americans in order to measure food quality intake and the potential to prevent chronic disease. It is a continuous variable, with a perfect score of 60 and a minimum score of 0.¹⁰ Participants with MS scored an average of 34.46 on the HEI. Participants without MS have a slightly higher average HEI score (38.38).

Physical Activity

People with MS often experience significant declines in mobility, activities of daily living, and health-related quality of life.²⁰ They may also be less physically active than the general population.^{21,22} The benefits of reduced sedentary behaviour and increased levels of physical activity for people with MS can result in reduced disability, improved mobility and improved quality of life,^{20,24-25} as well as reducing related co-morbidities such as cardiovascular disease and diabetes.

The majority of Atlantic PATH participants with MS report engaging in moderate levels of physical activity (44%), while 17% have high levels, and 39% have low levels of activity.ⁱ

ⁱ In accordance to the International Physical Activity Questionnaire (IPAQ), individuals who meet a high level of physical activity participate in vigorous intensity activity at least three days/week (≥ 1500 metabolic equivalent task (MET) minutes), or seven days of walking, moderate-intensity or vigorous intensity activities (≥ 3000 MET minutes). A moderate level of physical activity includes ≥ 3 days/week of vigorous activity of ≥ 20 minutes per day, or ≥ 5 days of moderate-intensity activity or walking ≥ 30 minutes per day, or ≥ 5 days of any combination of walking, moderate-intensity or vigorous intensity achieving ≥ 600 MET minutes/week. Individuals who do not meet the criteria for moderate or high levels of physical activity fall into the low category with less than 600 MET minutes/week.²³

Participants without MS report higher levels of physical activity with 33% engaging in high activity levels, 36% in moderate levels, and 31% in low activity levels (Table 7).

Table 7: Physical Activity Levels

Physical Activity Level (Categorical IPAQ scale)	Participants with MS n (%)	Participants without MS n (%)
Low	43 (38.7)	6260 (30.7)
Moderate	49 (44.1)	7307 (35.9)
High	19 (17.1)	6803 (33.4)

Conclusions

The prevalence rate of MS among Atlantic PATH participants is 0.6% compared to the national average of 0.2%. MS was particularly relevant for female PATH participants who were four times more likely to be diagnosed than male participants. While the majority of participants ranked their health status as “good,” participants also reported high levels of fatigue, as well as difficulty sleeping and relaxing which can impact health-related quality of life.

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