

SUPPLEMENTAL MATERIAL APPENDIX

Time Trends of the Incidence, Prevalence, and Mortality of Parkinsonism

Jessica J. Wong, DC, MPH; Jeffrey C. Kwong, MD, MSc; Karen Tu, MD, MSc; Debra A. Butt, MD, MSc; Ray Copes, MD, MSc; Andrew S. Wilton, MSc; Brian J. Murray, MD; Alexander Kopp, BA; Hong Chen, PhD

Corresponding author: Dr. Hong Chen, Public Health Ontario, 480 University Avenue, Toronto, Ontario, Canada M5G 1V2, telephone: 647-260-7109, email: hong.chen@oahpp.ca

Contents:

- **Appendix e-1.** Selected risk factors of persons with parkinsonism (including Parkinson's disease) in Ontario, Canada, 1996/97 to 2013/14
- **Appendix e-2A.** Number and crude and age- and sex-standardized incidence of parkinsonism (including Parkinson's disease) per 100,000 person years in Ontario, Canada, 1996/97 to 2013/14, by young-onset (20-39 years of age) and mid/late-onset (40 years and older)
- **Appendix e-2B.** Number and crude and age- and sex-standardized incidence of parkinsonism (including Parkinson's disease) per 100,000 person years in Ontario, Canada, 1996/97 to 2013/14, by sex
- **Appendix e-2C.** Number and crude and age- and sex-standardized incidence of parkinsonism (including Parkinson's disease) per 100,000 person years in Ontario, Canada, 1996/97 to 2013/14, by 5- and 10-year age groups
- **Appendix e-3A.** Number, and crude- and age- and sex-standardized prevalence of parkinsonism (including Parkinson's disease) per 1,000 persons in Ontario, Canada, 1996/97 to 2013/14, by young-onset (20-39 years) and mid/late-onset (40 years and older)
- **Appendix e-3B.** Number, and crude- and age- and sex-standardized prevalence of parkinsonism (including Parkinson's disease) per 1,000 persons in Ontario, Canada, 1996/97 to 2013/14, by sex
- **Appendix e-3C.** Number, and crude- and age- and sex-standardized prevalence of parkinsonism (including Parkinson's disease) per 1,000 persons in Ontario, Canada, 1996/97 to 2013/14, by 5- and 10-year age groups
- **Appendix e-4.** Number, and crude- and age- and sex-standardized post-diagnosis mortality of parkinsonism (including Parkinson's disease) per 1,000 person years in Ontario, Canada, 1996/97 to 2013/14, by young-onset (20-39 years) and mid/late-onset (40 years and older)
- **Appendix e-5A.** Number, and crude- and age- and sex-standardized prevalence of selected risk factors (using hospitalizations) among persons with parkinsonism (including Parkinson's disease) per 100 persons in Ontario, Canada, 1996/97 to 2013/14
- **Appendix e-5B.** Number, and crude- and age- and sex-standardized prevalence of selected risk factors (using algorithms) among persons with parkinsonism (including Parkinson's disease) per 100 persons in Ontario, Canada, 1996/97 to 2013/14
- **Appendix e-6A.** Rate ratio of incidence of mid/late-onset parkinsonism using Poisson regression modeling, 1996/97 to 2013/14, with selected risk factors (using algorithms or hospitalization data) among persons with parkinsonism added to models
- **Appendix e-6B.** Rate ratio of age- and sex-standardized incidence of mid/late-onset parkinsonism using Poisson regression modeling, 1996/97 to 2013/14, with selected risk factors (using algorithms or hospitalization data) among the general population added to models
- **Appendix e-6C.** Rate ratio of incidence of age- and sex-standardized mid/late-onset parkinsonism using Poisson regression modeling, 1996/97 to 2013/14, with selected risk factors among the general population added to models

Appendix e-1. Selected risk factors of persons with parkinsonism (including Parkinson’s disease) in Ontario, Canada, 1996/97 to 2013/14*

Risk Factor**, n (%)	1996/97 to 2013/14 N=73,129	1996/97 N=3,461	2013/14 N=4,791
Hypertension	37149 (50.80)	1489 (43.02)	2527 (52.74)
Diabetes	15783 (21.58)	538 (15.54)	1386 (28.93)
Chronic obstructive pulmonary disease (COPD)	9070 (12.40)	620 (17.91)	335 (6.99)
Coronary artery disease	8711 (11.91)	492 (14.22)	402 (8.39)
Congestive heart failure	6591 (9.01)	367 (10.60)	338 (7.05)
Dementia**	15860 (15.25)	509 (14.71)	912 (19.04)
Stroke	4165 (5.70)	179 (5.17)	151 (3.15)
Traumatic brain injury	1003 (0.96)	47 (1.36)	60 (1.25)

*Fiscal year begins on April 1

**Diabetes, traumatic brain injury, congestive heart failure, hypertension, and COPD were ascertained using algorithms. All other selected risk factors were ascertained using Canadian Institute for Health Information (CIHI) hospitalization data (5-year look back window). Dementia ascertainment was conducted using a look-back window to 1991

Appendix e-2A. Number and crude and age- and sex-standardized* incidence of parkinsonism (including Parkinson's disease) per 100,000 person years in Ontario, Canada, 1996/97 to 2013/14, by young-onset (20-39 years of age) and mid/late-onset (40 years and older)**

All Persons with Parkinsonism				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	3461	8089254.64	42.79	45.35
1997	3558	8208972.30	43.34	45.60
1998	3820	8317378.74	45.93	47.74
1999	3936	8434426.44	46.67	47.93
2000	3775	8581957.81	43.99	44.84
2001	3664	8759248.84	41.83	42.34
2002	3810	8934354.71	42.64	42.70
2003	3831	9084702.12	42.17	41.75
2004	3888	9231692.58	42.12	41.30
2005	4307	9371145.24	45.96	44.48
2006	4149	9503771.05	43.66	41.90
2007	4199	9615904.89	43.67	41.30
2008	4305	9733200.96	44.23	41.08
2009	4268	9851582.81	43.32	39.73
2010	4498	9992494.41	45.01	40.72
2011	4411	10125619.92	43.56	38.77
2012	4458	10287464.28	43.33	38.01
2013/14	4791	10430961.07	45.93	39.43

Young Onset (20-39 years)				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	41	3530313.13	1.16	1.20
1997	48	3524063.17	1.36	1.39
1998	55	3505534.11	1.57	1.57
1999	55	3496983.56	1.57	1.57
2000	69	3506552.02	1.97	1.96
2001	77	3529507.25	2.18	2.18
2002	61	3541234.53	1.72	1.73
2003	67	3531673.35	1.90	1.91
2004	58	3519056.00	1.65	1.69
2005	59	3511155.77	1.68	1.73
2006	56	3510870.40	1.60	1.68
2007	55	3507193.91	1.57	1.58
2008	55	3509621.74	1.57	1.65
2009	58	3515822.95	1.65	1.69
2010	57	3540722.13	1.61	1.66
2011	53	3563077.92	1.49	1.59
2012	55	3615733.82	1.52	1.64
2013/14	37	3653273.84	1.01	1.06

Mid/Late Onset (≥40 years)				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	3420	4558941.51	75.02	75.01
1997	3510	4684909.13	74.92	75.30
1998	3765	4811844.64	78.24	78.75
1999	3881	4937442.88	78.60	79.07
2000	3706	5075405.79	73.02	73.65
2001	3587	5229741.59	68.59	69.32
2002	3749	5393120.18	69.51	70.22
2003	3764	5553028.77	67.78	68.51
2004	3830	5712636.59	67.04	67.91
2005	4248	5859989.00	72.49	73.20
2006	4093	5992900.65	68.93	68.30
2007	4144	6108710.98	67.84	67.99
2008	4250	6223579.21	68.29	67.57
2009	4210	6335759.86	66.45	65.28
2010	4441	6451772.28	68.83	66.96
2011	4358	6562542.00	66.41	63.74
2012	4403	6671730.46	65.99	62.45
2013/14	4754	6777687.23	70.14	65.22

* Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

Appendix e-2B. Number and crude and age- and sex-standardized* incidence of parkinsonism (including Parkinson's disease) per 100,000 person years in Ontario, Canada, 1996/97 to 2013/14, by sex**

Males				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	1840	3922287.87	46.91	24.53
1997	1952	3987904.53	48.95	25.36
1998	2110	4042364.76	52.20	26.64
1999	2075	4103580.20	50.57	25.49
2000	1997	4182039.65	47.75	23.87
2001	1919	4275597.83	44.88	22.23
2002	2043	4360868.89	46.85	22.89
2003	2087	4433604.39	47.07	22.69
2004	2127	4503736.93	47.23	22.48
2005	2439	4571798.61	53.35	25.02
2006	2273	4634244.49	49.05	22.77
2007	2374	4680272.71	50.72	23.10
2008	2421	4729329.44	51.19	22.74
2009	2416	4778718.18	50.56	22.10
2010	2588	4842177.19	53.45	22.95
2011	2519	4903906.94	51.37	21.56
2012	2582	4983536.95	51.81	21.42
2013/14	2792	5052213.32	55.26	22.25

Females				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	1621	4166966.78	38.90	20.82
1997	1606	4221067.76	38.05	20.23
1998	1710	4275013.99	40.00	21.09
1999	1861	4330846.23	42.97	22.44
2000	1778	4399918.17	40.41	20.98
2001	1745	4483651.01	38.92	20.11
2002	1767	4573485.82	38.64	19.81
2003	1744	4651097.74	37.50	19.05
2004	1761	4727955.65	37.25	18.82
2005	1868	4799346.63	38.92	19.46
2006	1876	4869526.56	38.53	19.13
2007	1825	4935632.18	36.98	18.20
2008	1884	5003871.51	37.65	18.35
2009	1852	5072864.63	36.51	17.62
2010	1910	5150317.22	37.09	17.77
2011	1892	5221712.98	36.23	17.21
2012	1876	5303927.33	35.37	16.59
2013/14	1999	5378747.75	37.16	17.18

* Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

Appendix e-2C. Number and crude and age- and sex-standardized* incidence of parkinsonism (including Parkinson's disease) per 100,000 person years in Ontario, Canada, 1996/97 to 2013/14, by 5- and 10-year age groups**

40-49 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	101	1653552.92	6.11	1.30
1997	108	1688123.56	6.40	1.37
1998	104	1727764.66	6.02	1.29
1999	131	1771506.51	7.39	1.59
2000	107	1825114.59	5.86	1.26
2001	118	1885521.15	6.26	1.34
2002	143	1946022.08	7.35	1.57
2003	115	2002220.81	5.74	1.23
2004	113	2052855.88	5.50	1.18
2005	146	2091048.88	6.98	1.49
2006	136	2110360.17	6.44	1.36
2007	115	2106837.59	5.46	1.15
2008	135	2096473.38	6.44	1.36
2009	110	2080287.76	5.29	1.11
2010	139	2058310.30	6.75	1.43
2011	127	2029606.41	6.26	1.30
2012	132	1999449.14	6.60	1.35
2013/14	120	1956521.35	6.13	1.26

50-59 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	215	1107872.01	19.41	3.05
1997	239	1170453.76	20.42	3.22
1998	271	1228303.02	22.06	3.49
1999	269	1279818.43	21.02	3.33
2000	260	1333377.02	19.50	3.10
2001	260	1389962.88	18.71	2.64
2002	294	1445490.74	20.34	3.19
2003	291	1497556.65	19.43	3.04
2004	309	1553001.19	19.90	3.10
2005	352	1612983.73	21.82	3.38
2006	356	1667826.71	21.35	3.30
2007	332	1703598.10	19.49	3.01
2008	373	1746278.31	21.36	3.32
2009	381	1794751.51	21.23	3.33

2010	391	1849389.32	21.14	3.29
2011	367	1905197.64	19.26	2.99
2012	393	1956230.90	20.09	3.12
2013/14	456	2006583.86	22.73	3.53

60-69 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	692	886763.63	78.04	8.13
1997	694	891003.89	77.89	8.11
1998	779	895479.06	86.99	9.04
1999	871	902770.20	96.48	10.06
2000	725	907901.65	79.85	8.35
2001	669	917636.53	72.90	7.65
2002	732	936037.17	78.20	8.26
2003	716	961270.57	74.48	7.91
2004	744	991328.50	75.05	8.01
2005	838	1017766.62	82.34	8.77
2006	778	1055304.35	73.72	7.93
2007	890	1117700.39	79.68	8.60
2008	815	1176187.26	69.29	7.47
2009	895	1229331.68	72.80	7.89
2010	947	1283696.28	73.77	7.99
2011	1001	1336046.08	74.92	8.13
2012	1021	1386655.98	73.63	7.87
2013/14	1071	1440309.75	74.36	7.90

≥70 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	2412	910752.95	264.84	32.39
1997	2469	93527.92	263.97	32.34
1998	2611	960297.90	271.89	33.28
1999	2610	983347.74	265.42	32.32
2000	2614	1009012.54	259.07	31.35
2001	2540	1036621.04	245.03	29.50
2002	2580	1065570.18	242.12	28.98
2003	2642	1091980.74	241.95	28.80
2004	2664	1115451.02	238.83	28.33
2005	2912	1138190.24	255.84	30.01
2006	2823	1159409.42	243.49	28.63
2007	2807	1180574.89	237.77	27.90

2008	2927	1204640.26	242.98	28.27
2009	2824	1231388.92	229.33	26.72
2010	2964	1260376.38	235.17	27.34
2011	2863	1291691.86	221.65	25.71
2012	2857	1329394.44	214.91	25.01
2013/14	3107	1374272.27	226.08	26.31

50-54 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	92	607801.99	15.14	1.36
1997	99	655976.48	15.09	1.36
1998	115	694068.99	16.57	1.49
1999	105	726887.73	14.45	1.30
2000	99	761071.53	13.01	1.17
2001	120	790668.87	15.18	1.37
2002	115	796842.05	14.43	1.30
2003	122	809859.80	15.06	1.36
2004	125	832308.31	15.02	1.35
2005	129	859798.32	15.00	1.35
2006	131	886766.38	14.77	1.33
2007	111	917233.44	12.10	1.09
2008	132	945756.47	13.96	1.26
2009	162	971629.38	16.67	1.50
2010	149	997920.62	14.93	1.34
2011	135	1027632.57	13.14	1.18
2012	150	1048579.11	14.31	1.29
2013/14	182	1070181.98	17.01	1.53

55-59 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	123	500070.02	24.60	1.68
1997	140	514477.28	27.21	1.86
1998	156	534234.03	29.20	2.00
1999	164	552930.70	29.66	2.03
2000	161	572305.49	28.13	1.92
2001	140	599294.00	23.36	1.60
2002	179	648648.69	27.60	1.89
2003	169	687696.85	24.57	1.68
2004	184	720692.88	25.53	1.75
2005	223	753185.41	29.61	2.03

2006	225	781060.34	28.81	1.97
2007	221	786364.66	28.10	1.92
2008	241	800521.84	30.11	2.06
2009	219	823122.13	26.61	1.82
2010	242	851468.70	28.42	1.95
2011	232	877565.07	26.37	1.81
2012	243	907651.79	26.77	1.84
2013/14	274	936401.88	29.26	2.00

60-64 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	240	457835.58	52.42	2.90
1997	248	458300.45	54.11	2.99
1998	261	460857.38	5.66	3.13
1999	299	467936.91	63.90	3.54
2000	249	474543.38	52.47	2.90
2001	239	484741.81	49.30	2.73
2002	264	501754.21	52.62	2.91
2003	271	523265.23	51.79	2.87
2004	272	544611.92	49.94	2.76
2005	353	564399.92	62.54	3.46
2006	285	589854.58	48.32	2.67
2007	358	635848.84	56.30	3.11
2008	347	673689.07	51.51	2.85
2009	368	706786.76	52.07	2.88
2010	399	741722.78	53.79	2.98
2011	407	768834.29	52.94	2.93
2012	410	773116.29	53.03	2.94
2013/14	409	787030.68	51.97	2.88

65-69 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	452	428928.05	105.38	5.23
1997	446	432703.44	103.07	5.11
1998	518	434621.68	119.18	5.91
1999	572	434833.29	131.54	6.52
2000	476	433358.27	109.84	5.44
2001	430	432894.71	99.33	4.92
2002	468	434282.97	107.76	5.35
2003	445	438005.34	101.60	5.04

2004	472	446716.58	105.66	5.25
2005	485	453366.70	106.98	5.31
2006	493	465449.76	105.92	5.26
2007	532	481851.55	114.07	5.48
2008	468	502498.20	93.13	4.62
2009	527	522544.91	100.85	5.01
2010	548	541973.50	101.11	5.02
2011	594	567211.80	104.72	5.19
2012	611	613539.69	99.59	4.94
2013/14	662	653279.07	101.33	5.03

70-74 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	748	370551.46	201.86	9.10
1997	714	373833.56	190.99	8.63
1998	681	377757.83	180.27	8.11
1999	702	379283.56	185.09	8.31
2000	696	383292.92	181.58	0.81
2001	644	388294.14	165.85	7.41
2002	676	392806.03	172.10	7.68
2003	693	395063.72	175.41	7.83
2004	714	396329.81	180.15	8.04
2005	718	395958.39	181.33	8.10
2006	685	396493.57	172.76	7.72
2007	697	398789.59	174.78	7.81
2008	659	404650.87	162.86	7.27
2009	667	415250.78	160.63	7.17
2010	698	425190.28	164.16	7.33
2011	659	437378.12	150.67	6.73
2012	718	452220.82	158.77	7.09
2013/14	796	472197.47	168.57	7.52

75-79 years of age				
Year	Cases	Person-years	Crude incidence per 100,000 person-years	Age- and sex-standardized incidence per 100,000 person-years
1996/97	643	251605.69	255.59	9.26
1997	785	266954.74	294.06	10.65
1998	851	282964.57	300.74	10.88

1999	825	297642.91	277.18	10.02
2000	865	305564.50	283.08	10.22
2001	804	31161.68	258.39	9.32
2002	795	316650.07	251.07	9.04
2003	814	322223.44	252.62	9.07
2004	794	325148.73	244.20	8.75
2005	891	329381.95	270.51	9.65
2006	892	334056.44	267.02	9.54
2007	889	338219.80	262.85	9.35
2008	890	341573.60	260.56	9.27
2009	862	344119.83	250.49	8.90
2010	878	346993.33	253.03	9.01
2011	835	349795.21	238.71	8.48
2012	801	354507.15	225.95	8.02
2013/14	887	362502.23	244.69	8.68

* Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

Appendix e-3A. Number, and crude- and age- and sex-standardized* prevalence of parkinsonism (including Parkinson's disease) per 1,000 persons in Ontario, Canada, 1996/97 to 2013/14, by young-onset (20-39 years) and mid/late-onset (40 years and older)**

All Persons with Parkinsonism				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	19833	8107876	2.45	2.55
1997	20982	8228607	2.62	2.55
1998	22108	8338104	2.70	2.65
1999	23346	8456454	2.76	2.79
2000	24656	8605427	2.87	2.88
2001	25592	8783741	2.91	2.91
2002	26417	8959835	2.95	2.93
2003	27325	9111076	3.00	2.96
2004	28199	9259110	3.05	2.98
2005	28944	9399335	3.08	3.00
2006	30111	9533202	3.16	3.05
2007	30965	9646421	3.21	3.06
2008	31958	9764724	3.27	3.08
2009	32912	9884042	3.33	3.09
2010	33911	10026236	3.38	3.11
2011	34983	10160346	3.44	3.13
2012	36091	10323466	3.50	3.13
2013/14	37100	10468051	3.54	3.13

Young Onset (20-39 years)				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	225	3530470	0.06	0.06
1997	260	3524235	0.07	0.07
1998	302	3505716	0.09	0.09
1999	352	3497206	0.10	0.10
2000	405	3506802	0.12	0.12
2001	470	3529788	0.13	0.13
2002	539	3541562	0.15	0.15
2003	592	3532005	0.17	0.17
2004	649	3519429	0.18	0.19
2005	702	3511537	0.20	0.21
2006	754	3511273	0.21	0.22
2007	803	3507611	0.23	0.24
2008	850	3510064	0.24	0.25
2009	899	3516268	0.26	0.27
2010	948	3541189	0.27	0.28
2011	997	3563570	0.28	0.30
2012	1040	3616227	0.29	0.31
2013/14	1087	3653768	0.30	0.32

Mid/Late Onset (≥40 years)				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons

1996/97	19608	4577406	4.28	4.21
1997	20722	4704372	4.33	4.40
1998	21806	4832388	4.51	4.45
1999	22994	4959248	4.64	4.59
2000	24251	5098625	4.76	4.73
2001	25122	5253953	4.78	4.78
2002	25878	5418273	4.78	4.80
2003	26733	5579071	4.79	4.83
2004	27550	5739681	4.80	4.86
2005	28242	5887798	4.80	4.87
2006	29357	6021929	4.88	4.95
2007	30162	6138810	4.91	4.96
2008	31108	6254660	4.97	4.98
2009	32013	6367774	5.03	4.99
2010	32963	6485047	5.08	5.01
2011	33986	6596776	5.15	5.03
2012	35051	6707239	5.23	5.03
2013/14	36013	6814283	5.28	5.01

* Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

***Population on July 1

Appendix e-3B. Number, and crude- and age- and sex-standardized* prevalence of parkinsonism (including Parkinson's disease) per 1,000 persons in Ontario, Canada, 1996/97 to 2013/14, by sex**

Males				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	10295	3931952	2.62	1.34
1997	10785	3997966	2.70	1.36
1998	11368	4053012	2.80	1.40
1999	12028	4114922	2.92	1.45
2000	12633	4194039	3.01	1.48
2001	13107	4288126	3.06	1.49
2002	13463	4373825	3.08	1.49
2003	13926	4446990	3.13	1.50
2004	14405	4517689	3.19	1.52
2005	14836	4586202	3.23	1.53
2006	15635	4649484	3.36	1.57
2007	16125	4696120	3.43	1.57
2008	16745	4745780	3.54	1.59
2009	17338	4795729	3.62	1.60
2010	17911	4859884	3.69	1.61
2011	18581	4922270	3.77	1.63
2012	19235	5002634	3.85	1.63
2013/14	19894	5072016	3.92	1.63

Females				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	9538	4175924	2.28	1.21
1997	10197	4230641	2.41	1.26
1998	10740	4285092	2.51	1.30
1999	11318	4341532	2.61	1.34
2000	12023	4411388	2.73	1.40
2001	12485	4495615	2.78	1.42
2002	12954	4586010	2.82	1.44
2003	13399	4664086	2.87	1.46
2004	13794	4741421	2.91	1.47
2005	14108	4813133	2.93	1.47
2006	14476	4883718	2.96	1.48
2007	14840	4950301	3.00	1.49
2008	15213	5018944	3.03	1.49
2009	15574	5088313	3.06	1.49
2010	16000	5166352	3.10	1.50
2011	16402	5238076	3.13	1.50
2012	16856	5320832	3.17	1.50
2013/14	17206	5396035	3.19	1.49

* Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

***Population on July 1

Appendix e-3C. Number, and crude- and age- and sex-standardized* prevalence of parkinsonism (including Parkinson's disease) per 1,000 persons in Ontario, Canada, 1996/97 to 2013/14, by 5- and 10-year age groups**

10-year age groups:

40-49 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	538	1653913	0.33	0.07
1997	634	1688526	0.38	0.08
1998	733	1728215	0.42	0.09
1999	824	1772007	0.47	0.10
2000	946	1825667	0.52	0.11
2001	1040	1886129	0.55	0.12
2002	1143	1946647	0.59	0.13
2003	1266	2002913	0.63	0.14
2004	1356	2053614	0.66	0.14
2005	1441	2091808	0.69	0.15
2006	1561	2111177	0.74	0.16
2007	1676	2107692	0.80	0.17
2008	1771	2097310	0.84	0.18
2009	1872	2081174	0.90	0.19
2010	1947	2059210	0.95	0.20
2011	2052	2030532	1.01	0.21
2012	2143	2000374	1.07	0.23
2013/14	2237	1957464	1.14	0.24

50-59 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	1495	1108881	1.35	0.21
1997	1665	1171525	1.42	0.22
1998	1858	1229466	1.51	0.24
1999	2075	1281110	1.62	0.26
2000	2283	1332831	1.71	0.27
2001	2490	1391531	1.79	0.28
2002	2685	1447170	1.86	0.29
2003	2904	1499330	1.94	0.30
2004	3098	1554881	1.99	0.31
2005	3301	1614962	2.04	0.32

2006	3545	1669937	2.12	0.33
2007	3761	1705809	2.20	0.34
2008	3955	1748538	2.26	0.35
2009	4180	1797075	2.33	0.36
2010	4411	1851812	2.38	0.37
2011	4656	1907737	2.44	0.38
2012	4854	1958832	2.48	0.39
2013/14	5076	2009285	2.53	0.39

60-69 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	4958	890010	5.57	0.58
1997	5374	894371	6.01	0.63
1998	5742	898918	6.39	0.66
1999	6155	906474	6.79	0.71
2000	6625	911807	7.27	0.76
2001	6881	921607	7.47	0.78
2002	7060	940078	7.51	0.79
2003	7287	965372	7.55	0.80
2004	7464	995551	7.50	0.80
2005	7672	1022125	7.51	0.80
2006	7971	1059898	7.52	0.80
2007	8163	1122540	7.27	0.78
2008	8462	1181366	7.16	0.77
2009	8676	1234634	7.03	0.76
2010	8965	1289391	6.95	0.75
2011	9305	1342031	6.93	0.75
2012	9691	1392995	6.96	0.74
2013/14	10053	1446917	6.95	0.74

≥70 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	12617	924602	13.65	1.66
1997	13049	949950	13.74	1.66
1998	13473	975789	13.81	1.67
1999	13940	999657	13.94	1.68
2000	14397	1026320	14.03	1.69

2001	14711	1054686	13.95	1.67
2002	14990	1084378	13.82	1.66
2003	15276	1111456	13.74	1.65
2004	15632	1135635	13.77	1.66
2005	15828	1158903	13.66	1.65
2006	16280	1180917	13.79	1.67
2007	16562	1202769	13.77	1.67
2008	16920	1227446	13.78	1.67
2009	17285	1254891	13.77	1.67
2010	17640	1284634	13.73	1.67
2011	17973	1316476	13.65	1.66
2012	18363	1355037	13.55	1.66
2013/14	18647	1400617	13.31	1.63

5-year age groups:

50-54 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	557	608187	0.92	0.08
1997	638	656393	0.97	0.09
1998	724	694534	1.04	0.09
1999	819	727425	1.13	0.10
2000	903	761673	1.19	0.11
2001	989	791306	1.25	0.11
2002	1097	797520	1.38	0.12
2003	1194	810545	1.47	0.13
2004	1278	833034	1.53	0.14
2005	1362	860562	1.58	0.14
2006	1460	887593	1.64	0.15
2007	1552	918087	1.69	0.15
2008	1621	946649	1.71	0.15
2009	1706	972532	1.75	0.16
2010	1815	998872	1.82	0.16
2011	1899	1028615	1.85	0.17
2012	1979	1049571	1.89	0.17
2013/14	2061	1071167	1.92	0.17

55-59 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	938	500694	1.87	0.13
1997	1027	515132	1.99	0.14
1998	1134	534932	2.12	0.15
1999	1256	553685	2.27	0.16
2000	1380	573158	2.41	0.16
2001	1501	600225	2.50	0.17
2002	1588	649650	2.44	0.17
2003	1710	688785	2.48	0.17
2004	1820	721847	2.52	0.17
2005	1939	754400	2.57	0.18
2006	2085	782344	2.67	0.18
2007	2209	787722	2.80	0.19
2008	2334	801889	2.91	0.20
2009	2474	824542	3.00	0.21
2010	2596	852940	3.04	0.21
2011	2757	879122	3.14	0.21
2012	2875	909261	3.16	0.22
2013/14	3015	938118	3.21	0.22

60-64 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	1792	458965	3.90	0.22
1997	1961	459478	4.27	0.24
1998	2108	462069	4.56	0.25
1999	2277	469210	4.85	0.27
2000	2468	475911	5.19	0.29
2001	2590	486158	5.33	0.29
2002	2700	503238	5.37	0.30
2003	2809	524803	5.35	0.30
2004	2908	546223	5.32	0.29
2005	3004	566072	5.31	0.29
2006	3193	591724	5.40	0.30
2007	3278	637829	5.14	0.28
2008	3432	675836	5.08	0.28
2009	3577	709033	5.04	0.28

2010	3763	744162	5.06	0.28
2011	3948	771407	5.12	0.28
2012	4140	775700	5.34	0.30
2013/14	4329	789626	5.48	0.30

65-69 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	3166	431045	7.34	0.36
1997	3413	434893	7.85	0.39
1998	3634	436849	8.32	0.41
1999	3878	437264	8.87	0.44
2000	4157	435896	9.54	0.47
2001	4291	435449	9.85	0.49
2002	4360	436840	9.98	0.50
2003	4478	440569	10.16	0.50
2004	4556	449328	10.14	0.50
2005	4668	456053	10.24	0.51
2006	4778	468174	10.21	0.51
2007	4885	484711	10.08	0.50
2008	5030	505530	9.95	0.49
2009	5099	525601	9.70	0.48
2010	5202	545229	9.54	0.47
2011	5357	570624	9.39	0.47
2012	5551	617295	8.99	0.45
2013/14	5724	657291	8.71	0.43

70-74 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	4331	374099	11.58	0.52
1997	4653	377467	12.33	0.55
1998	4919	381499	12.89	0.58
1999	5102	383047	13.32	0.60
2000	5244	387147	13.55	0.61
2001	5406	392319	13.78	0.62
2002	5452	396895	13.74	0.61
2003	5509	399301	13.80	0.62
2004	5562	400675	13.88	0.62

2005	5616	400330	14.03	0.63
2006	5750	400875	14.34	0.64
2007	5794	403261	14.37	0.64
2008	5877	409130	14.36	0.64
2009	5908	419783	14.07	0.63
2010	6000	429764	13.96	0.62
2011	6082	442025	13.76	0.61
2012	6136	457050	13.43	0.60
2013/14	6253	477220	13.10	0.58

75-79 years of age				
Year	Cases	Population***	Crude prevalence per 1,000 persons	Age- and sex- standardized prevalence per 1,000 persons
1996/97	3924	255655	15.35	0.55
1997	3961	271284	14.60	0.53
1998	4143	287698	14.40	0.52
1999	4363	302708	14.41	0.52
2000	4583	310862	14.74	0.53
2001	4773	316606	15.08	0.54
2002	4888	322107	15.18	0.55
2003	5033	327673	15.36	0.55
2004	5166	330541	15.63	0.56
2005	5282	334830	15.78	0.57
2006	5375	339802	15.82	0.57
2007	5495	344066	15.97	0.57
2008	5628	347670	16.19	0.58
2009	5742	350296	16.39	0.59
2010	5844	353321	16.54	0.59
2011	5866	356068	16.47	0.59
2012	5976	360820	16.56	0.59
2013/14	5979	368784	16.21	0.58

* Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

***Population on July 1

Appendix e-4. Number, and crude- and age- and sex-standardized* post-diagnosis mortality of parkinsonism (including Parkinson's disease) per 1,000 person years in Ontario, Canada, 1996/97 to 2013/14, by young-onset (20-39 years) and mid/late-onset (40 years and older)**

All Persons with Parkinsonism				
Year	Deaths	Person-years	Crude mortality per 1,000 person-years	Age- and sex- standardized mortality per 1,000 person-years
1996/97	2298	22238.54	103.33	90.79
1997	2356	23421.08	100.59	90.23
1998	2501	24766.34	100.98	92.08
1999	2516	26095.36	96.42	89.60
2000	2743	27119.31	101.15	95.24
2001	2731	27933.40	97.77	93.36
2002	2776	28903.62	96.04	92.61
2003	2857	29803.10	95.86	93.39
2004	3009	30705.33	98.00	95.80
2005	3013	31799.03	94.75	93.47
2006	3169	32788.24	96.65	95.63
2007	3106	33713.20	92.13	91.89
2008	3223	34721.47	92.82	92.65
2009	3167	35656.49	88.82	88.96
2010	3293	36832.69	89.40	90.11
2011	3205	37817.49	84.75	85.52
2012	3325	38985.62	85.29	86.63
2013/14	3399	40261.86	84.42	85.79

Young Onset (20-39)				
Year	Deaths	Person-years	Crude mortality per 1,000 person-years	Age- and sex- standardized mortality per 1,000 person-years
1996/97	6	262.67	22.84	21.42
1997	6	304.75	19.69	20.68
1998	NA***	NA***	8.42	0.21
1999	NA***	NA***	4.94	4.93
2000	NA***	NA***	8.48	8.21
2001	NA***	NA***	9.19	9.43
2002	6	596.50	10.06	9.68
2003	6	654.92	9.16	9.19
2004	NA***	NA***	5.68	5.68
2005	NA***	NA***	3.95	4.05
2006	6	807.59	7.43	7.25
2007	NA***	NA***	5.84	5.93
2008	NA***	NA***	5.72	4.57
2009	7	954.62	7.33	6.96
2010	NA***	NA***	2.99	3.14
2011	7	1045.96	6.69	6.93
2012	NA***	NA***	3.66	3.82
2013/14	7	1120.29	6.25	5.33

Mid/Late Onset (≥ 40 years)				
Year	Deaths	Person-years	Crude mortality per 1,000 person-years	Age- and sex- standardized mortality per 1,000 person-years
1996/97	2292	21975.87	104.30	92.52
1997	2350	23116.33	101.66	91.96
1998	2498	24410.22	102.33	91.87
1999	2514	25690.11	97.86	91.70
2000	2739	26647.39	102.79	97.40
2001	2726	27389.53	99.53	95.45
2002	2770	28307.12	97.86	94.67
2003	2851	29148.18	97.81	95.48
2004	3005	30000.83	100.16	98.04
2005	3010	31039.07	96.97	95.69
2006	3163	31980.66	98.90	97.82
2007	3101	32857.32	94.38	94.03
2008	3219	33818.56	95.18	94.84
2009	3160	34701.87	91.06	91.00
2010	3290	35828.32	91.83	92.28
2011	3198	36771.53	86.97	87.47
2012	3321	37891.70	87.64	88.69
2013/14	3392	39141.56	86.66	87.77

* Standardized using the 2005 data for the prevalent parkinsonism cases in Ontario

**Fiscal year begins on April 1

***Small cells <6 were suppressed to meet the data confidentiality restrictions of Institute for Clinical Evaluative Sciences

Appendix e-5A. Number, and crude- and age- and sex-standardized* prevalence of selected risk factors (using hospitalizations) among persons with parkinsonism (including Parkinson's disease) per 100 persons in Ontario, Canada, 1996/97 to 2013/14**

Stroke			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	312	9.01	3.05
1997	306	8.60	3.37
1998	322	8.43	1.81
1999	319	8.10	2.31
2000	321	8.50	2.09
2001	290	7.91	2.45
2002	282	7.40	1.71
2003	243	6.34	1.72
2004	225	5.79	2.18
2005	226	5.25	2.13
2006	193	4.65	1.57
2007	175	4.17	1.26
2008	174	4.04	1.28
2009	153	3.58	1.68
2010	157	3.49	1.50
2011	160	3.63	2.01
2012	156	3.50	0.89
2013/14	151	3.15	0.88

Coronary artery disease			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	492	14.22	3.79
1997	504	14.17	3.92
1998	504	13.19	3.77
1999	548	13.92	3.47
2000	533	14.12	4.36
2001	491	13.40	3.77
2002	550	14.44	3.97
2003	543	14.17	3.51
2004	462	11.88	2.95
2005	521	12.10	3.31
2006	471	11.35	2.66
2007	463	11.03	2.59
2008	483	11.22	2.71
2009	471	11.04	3.21
2010	417	9.27	2.50
2011	429	9.73	2.54
2012	427	9.58	2.59
2013/14	402	8.39	2.20

* Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

Appendix e-5B. Number, and crude- and age- and sex-standardized* prevalence of selected risk factors (using algorithms) among persons with parkinsonism (including Parkinson's disease) per 100 persons in Ontario, Canada, 1996/97 to 2013/14**

Chronic obstructive pulmonary disease			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	620	17.91	8.55
1997	609	17.12	6.39
1998	635	16.62	5.78
1999	629	15.98	6.67
2000	587	15.55	6.68
2001	552	15.07	6.38
2002	540	14.17	4.21
2003	544	14.20	4.69
2004	522	13.43	5.71
2005	534	12.40	3.88
2006	516	12.44	4.29
2007	447	10.65	4.19
2008	494	11.48	2.97
2009	401	9.40	2.84
2010	398	8.85	2.97
2011	366	8.30	3.19
2012	341	7.65	2.81
2013/14	335	6.99	2.72

Congestive heart failure			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	367	10.60	2.22
1997	388	10.91	2.71
1998	412	10.79	2.16
1999	394	10.01	2.38
2000	380	10.07	2.40
2001	385	10.51	2.55
2002	384	10.08	2.43
2003	432	11.28	2.43
2004	369	9.49	2.53
2005	380	8.82	2.08
2006	337	8.12	1.76
2007	351	8.36	1.86
2008	358	8.32	1.83
2009	312	7.31	1.72
2010	338	7.51	1.58
2011	326	7.39	1.42
2012	340	7.63	1.91
2013/14	338	7.05	1.57

Dementia			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	509	14.71	5.28
1997	475	13.35	3.62
1998	521	13.64	4.24
1999	563	14.30	4.42
2000	581	15.39	3.88
2001	584	15.94	4.80

2002	701	18.40	4.55
2003	649	16.94	4.64
2004	700	18.00	4.70
2005	759	17.62	4.28
2006	794	19.14	6.52
2007	761	18.12	6.46
2008	766	17.79	5.42
2009	816	19.12	7.22
2010	827	18.39	4.79
2011	852	19.32	6.78
2012	818	18.35	6.69
2013/14	912	19.04	5.55

Diabetes			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	538	15.54	5.93
1997	613	17.23	7.02
1998	576	15.08	5.99
1999	642	16.31	7.32
2000	647	17.14	6.71
2001	652	17.79	7.87
2002	718	18.85	8.58
2003	714	18.64	7.13
2004	767	19.73	8.40
2005	878	20.39	9.69
2006	919	22.15	10.22
2007	985	23.46	8.67
2008	1049	24.37	9.58
2009	1081	25.33	10.72
2010	1210	26.90	10.62
2011	1192	27.02	10.40
2012	1216	27.28	11.14
2013/14	1386	28.93	11.93

Hypertension			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	1489	43.02	18.10
1997	1576	44.29	20.46
1998	1687	44.16	18.03
1999	1743	44.28	16.98
2000	1720	45.56	18.42
2001	1738	47.43	17.78
2002	1843	48.37	19.27
2003	1957	51.08	22.05
2004	2041	52.49	21.86
2005	2265	52.59	21.96
2006	2256	54.37	21.35
2007	2315	55.13	23.23
2008	2395	55.63	20.30
2009	2349	55.04	22.35
2010	2475	55.02	25.06
2011	2397	54.34	18.87
2012	2376	53.30	21.45
2013/14	2527	52.74	23.35

Traumatic brain injury			
Year	Persons with risk factor	Crude prevalence per 100 persons	Age- and sex- standardized prevalence per 100 persons
1996/97	47	1.36	1.37
1997	44	1.24	0.55
1998	49	1.28	0.70
1999	46	1.17	0.39
2000	33	0.87	0.35
2001	35	0.96	0.26
2002	43	1.13	1.00
2003	30	0.78	0.26
2004	33	0.85	0.85
2005	27	0.63	0.48
2006	27	0.65	1.75
2007	31	0.74	0.57
2008	31	0.72	0.62
2009	39	0.91	0.22
2010	45	1.00	0.51
2011	39	0.88	1.07
2012	32	0.72	0.15
2013/14	60	1.25	0.53

*Standardized using the 2001 Census data for the Ontario population

**Fiscal year begins on April 1

Appendix e-6A. Rate ratio of incidence of mid/late-onset parkinsonism using Poisson regression modeling, 1996/97 to 2013/14, with selected risk factors (using algorithms or hospitalization data) among persons with parkinsonism added to models

	Rate Ratio	95% CI	
A. Adjusted for age and sex			
Year	0.989	0.987	0.991
B. Adjusted for age, sex, and traumatic brain injury			
Year	0.989	0.987	0.991
C. Adjusted for age, sex, and dementia			
Year	0.989	0.986	0.991
D. Adjusted for age, sex, and stroke			
Year	0.993	0.990	0.995
E. Adjusted for age, sex, and diabetes			
Year	0.986	0.983	0.989
F. Adjusted for age, sex, and chronic obstructive pulmonary disease			
Year	0.992	0.990	0.995
G. Adjusted for age, sex, and hypertension			
Year	0.986	0.984	0.989
H. Adjusted for age, sex, and coronary artery disease			
Year	0.990	0.988	0.992
I. Adjusted for age, sex, and congestive heart failure			
Year	0.990	0.988	0.992

CI – confidence interval

Appendix e-6B. Rate ratio of incidence of mid/late-onset parkinsonism using Poisson regression modeling, 1996/97 to 2013/14, with selected risk factors (using algorithms or hospitalization data) among the general population added to models

	Rate Ratio	95% CI	
A. Adjusted for age and sex			
Year	0.989	0.987	0.991
B. Adjusted for age, sex, and traumatic brain injury			
Year	0.984	0.981	0.987
C. Adjusted for age, sex, and dementia			
Year	0.982	0.980	0.985
D. Adjusted for age, sex, and stroke			
Year	0.986	0.983	0.988
E. Adjusted for age, sex, and diabetes			
Year	0.981	0.979	0.984
F. Adjusted for age, sex, and chronic obstructive pulmonary disease			
Year	0.988	0.986	0.990
G. Adjusted for age, sex, and hypertension			
Year	0.988	0.985	0.990
H. Adjusted for age, sex, and coronary artery disease			
Year	0.988	0.986	0.990
I. Adjusted for age, sex, and congestive heart failure			
Year	0.989	0.987	0.991

CI – confidence interval

Appendix e-6C. Rate ratio of age-and sex-standardized incidence of mid/late-onset parkinsonism using Poisson regression modeling, 1996/97 to 2013/14, with selected risk factors added to models

	Rate Ratio	95% CI	
A. Unadjusted			
Year	0.989	0.987	0.991
B. Adjusted for rural residence			
Year	0.991	0.975	1.008
C. Adjusted for current smoking (daily or occasional)*			
Year	0.991	0.983	0.999
D. Adjusted for pesticide use (pesticide active ingredients used on all crops)*			
Year	0.989	0.986	0.992

*among the general population