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Research Report 212

Mortality–Air Pollution Associations in Low Exposure Environments (MAPLE): Phase 2

Michael Brauer et al.

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These Appendices were reviewed solely for spelling, grammar, and cross-references to the main text. They have not been formatted or fully edited by HEI. This document was part of the HEI Low-Exposure Epidemiology Studies Review Panel's review process.

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Appendix A. Tables

Table A.1. Descriptive statistics of 1991 CanCHEC analytical file, with Cox proportional hazard ratios of nonaccidental mortality, and exposure to three air pollutants (10-year moving average with 1-year lag).

	Person-		95% CI		$PM_{2.5}$		O_3		O_x	
Characteristic	years[a]	**HR[b]**	**Lower**	**Upper**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Total	52,845,300	-	-	-	9.04	3.32	35.89	6.85	28.90	5.66
Sex										
Female	27,069,100	-	-	-	9.06	3.30	35.90	6.85	28.97	5.65
Male	25,776,200	-	-	-	9.02	3.33	35.88	6.85	28.83	5.67
Age										
24-35 years	16,515,900	-	-	-	8.78	3.26	35.83	6.91	28.67	5.68
35-44 years	15,568,700	-	-	-	8.83	3.27	35.85	6.86	28.68	5.65
45-54 years	9,936,100	-	-	-	9.05	3.30	36.05	6.83	29.00	5.64
55-64 years	6,523,500	-	-	-	9.42	3.33	36.12	6.81	29.41	5.62
65-74 years	3,473,700	-	-	-	10.04	3.38	35.73	6.74	29.63	5.63
75-89 years	827,500	-	-	-	11.09	3.37	34.91	6.18	29.66	5.43
Immigrant status										
No	44,581,500	-	-	-	8.80	3.27	35.60	6.74	28.38	5.54
Yes	8,263,900	-	-	-	10.36	3.25	37.47	7.22	31.72	5.48
Income adequacy quintile										
Lowest [ref]	8,005,000	1.000	-	-	9.00	3.43	35.16	6.91	28.56	5.94
2nd	9,743,900	0.800	0.794	0.806	9.14	3.34	35.79	6.88	28.97	5.74
3rd	11,208,400	0.705	0.699	0.711	9.06	3.30	35.96	6.83	28.95	5.64
4th	11,829,400	0.637	0.632	0.643	9.03	3.28	36.09	6.82	28.96	5.58
Highest	12,058,600	0.548	0.543	0.553	8.99	3.26	36.20	6.80	28.98	5.49
Visible minority status										
No [ref]	50,180,900	1.000	-	-	8.98	3.31	35.87	6.85	28.76	5.64
Yes	2,664,400	0.770	0.757	0.783	10.25	3.09	36.20	6.95	31.60	5.39
Indigenous identity										
No [ref]	50,816,200	1.000	-	-	9.13	3.29	36.10	6.71	29.10	5.52

Yes	2,029,200	1.669	1.644	1.694	6.95	3.26	30.58	8.12	23.89	6.66
Employment status										
Employed [ref]	38,135,600	1.000	-	-	9.00	3.27	36.10	6.88	29.02	5.61
Unemployed	3,298,700	1.420	1.400	1.439	8.52	3.38	34.93	6.76	27.82	5.92
Not in labor force	11,411,100	1.548	1.537	1.560	9.35	3.40	35.46	6.72	28.81	5.73
Educational attainment										
< High school graduation [ref]	16,449,200	1.000	-	-	8.90	3.44	35.56	6.93	28.44	5.91
High school, with or without trades certification	20,142,500	0.817	0.812	0.822	8.99	3.29	35.96	6.87	28.82	5.60
Postsecondary nonuniversity	8,798,400	0.697	0.691	0.704	9.11	3.24	36.19	6.86	29.16	5.49
University degree	7,455,200	0.555	0.549	0.561	9.44	3.17	36.08	6.59	29.85	5.33
Occupational class										
Management [ref]	4,755,600	1.000	-	-	9.18	3.23	36.34	6.77	29.45	5.46
Professional	6,633,100	0.866	0.852	0.881	9.20	3.21	35.96	6.71	29.36	5.45
Skilled, technical, and supervisory	13,855,300	1.161	1.146	1.177	8.77	3.30	35.88	6.89	28.60	5.63
Semi-skilled	13,791,800	1.303	1.285	1.320	8.97	3.30	36.08	6.94	28.94	5.70
Unskilled	4,242,400	1.515	1.492	1.539	8.84	3.38	35.60	7.10	28.44	5.96
Not applicable	9,567,200	1.815	1.791	1.839	9.45	3.40	35.50	6.65	28.90	5.70
Community Size										
Pop: > 1,500,000 [ref]	14,729,100	1.000	-	-	10.75	2.74	36.76	5.74	32.16	4.45
Pop: 500,000 – 1,499,999	8,647,300	0.934	0.926	0.942	9.07	2.74	34.01	5.60	29.19	3.84

Pop: 100,000 – 499,999	9,473,900	1.012	1.004	1.020	9.57	3.41	39.02	8.07	30.28	6.31
Pop: 30,000 – 99,999	5,313,000	1.022	1.012	1.033	8.85	3.29	36.04	6.42	27.38	4.73
Pop: 10,000 – 29,999	2,083,600	1.023	1.008	1.038	7.30	3.03	32.69	7.25	24.47	5.43
Non-CMA/CA	12,598,500	1.027	1.019	1.035	7.00	3.01	34.28	6.84	25.23	5.02
Airshed										
Western [ref]	6,376,800	1.000	-	-	8.25	2.97	29.49	4.36	24.35	3.42
Prairie	6,887,200	0.935	0.924	0.945	6.68	2.05	32.20	4.32	26.24	3.73
West Central	3,176,600	1.040	1.026	1.054	6.84	2.17	29.25	3.92	23.98	3.71
Southern	5,226,300	1.104	1.092	1.117	5.81	2.20	32.51	3.20	23.54	2.81
Atlantic										
East Central	30,801,200	1.041	1.032	1.049	10.56	2.93	39.43	6.05	31.98	4.73
Northern	377,200	1.174	1.131	1.218	5.17	2.07	25.19	6.40	18.53	4.17
Urban form										
Active urban core [ref]	4,018,200	1.000	-	-	10.39	2.81	35.18	6.79	30.92	5.22
Transit-reliant suburb	3,402,900	0.942	0.930	0.954	10.86	2.74	35.23	5.99	31.91	4.80
Car-reliant suburb	21,217,300	0.875	0.866	0.883	9.98	3.00	36.91	6.68	30.95	5.01
Exurban	2,929,000	0.914	0.901	0.928	8.12	3.02	37.86	6.99	28.91	5.12
Non CMA/CA	21,277,900	0.944	0.935	0.953	7.69	3.27	34.84	6.93	25.99	5.22
Residential instability (CAN-Marg)										
Q1 (lowest) [ref]	11,902,200	1.000	-	-	8.57	3.40	37.27	7.10	29.22	5.79
Q2	13,703,800	0.993	0.985	1.002	8.59	3.34	36.49	7.29	28.46	5.75
Q3	10,950,500	0.993	0.984	1.002	8.97	3.40	34.89	6.94	28.12	5.90
Q4	9,457,000	0.999	0.990	1.008	9.61	3.15	35.46	6.25	29.36	5.42
Q5 (highest)	6,831,800	1.049	1.039	1.058	10.09	2.82	34.51	5.43	29.87	4.87
Dependence (CAN-Marg)										
Q1 (lowest) [ref]	8,688,000	1.000	-	-	9.25	3.49	35.13	7.22	29.16	6.04
Q2	9,111,300	0.985	0.975	0.996	9.45	3.33	35.98	6.87	29.43	5.57

Q3	8,829,500	0.982	0.972	0.993	9.61	3.27	36.60	6.96	29.76	5.45
Q4	11,400,900	0.982	0.972	0.991	9.19	3.22	36.32	7.03	29.05	5.53
Q5 (highest)	14,815,600	0.971	0.963	0.980	8.22	3.15	35.53	6.32	27.80	5.54
Material deprivation (CAN-Marg)										
Q1 (lowest) [ref]	11,256,000	1.000	-	-	8.93	3.08	37.00	6.85	29.27	5.35
Q2	11,938,300	1.048	1.039	1.057	9.37	3.11	36.70	6.99	29.19	5.41
Q3	10,696,900	1.074	1.065	1.084	9.28	3.22	36.13	6.97	29.18	5.47
Q4	8,687,200	1.114	1.104	1.124	9.28	3.29	35.24	6.84	29.17	5.84
Q5 (highest)	10,267,000	1.203	1.192	1.213	8.34	3.77	34.04	6.09	27.65	6.13
Ethnic concentration (CAN-Marg)										
Q1 (lowest) [ref]	14,892,300	1.000	-	-	7.75	3.21	35.67	6.85	27.40	5.43
Q2	12,257,900	1.014	1.007	1.022	8.84	3.23	36.49	7.00	28.93	5.53
Q3	9,231,600	1.003	0.995	1.011	9.24	3.20	35.48	7.01	29.13	5.78
Q4	8,374,900	1.010	1.001	1.019	10.15	3.06	35.90	6.73	30.13	5.56
Q5 (highest)	8,088,600	0.993	0.984	1.002	10.35	3.07	35.86	6.49	30.10	5.59

[a] Rounded to nearest hundred for confidentiality reasons – sums may not add up to totals.

[b] Hazard ratio for nonaccidental mortality relative to reference category (ref), stratified by age (5-year categories), sex, and immigrant status.

Table A.2. Descriptive statistics of 1996 CanCHEC analytical file, with Cox proportional hazard ratios of nonaccidental mortality, and exposure to three air pollutants (10-year moving average with 1-year lag).

	Person-		95% CI		$PM_{2.5}$		Ozone		O_x	
Characteristic	years[a]	**HR[b]**	**Lower**	**Upper**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Total	53,680,400	-	-	-	8.29	2.95	36.21	7.19	28.73	5.82
Sex										
Female	27,941,300	-	-	-	8.33	2.94	36.24	7.16	28.80	5.80
Male	25,739,100	-	-	-	8.25	2.96	36.17	7.21	28.65	5.84
Age										
24-35 years	12,805,600	-	-	-	8.10	2.92	36.12	7.33	28.55	5.92
35-44 years	15,310,800	-	-	-	8.12	2.90	36.11	7.20	28.50	5.80
45-54 years	12,023,100	-	-	-	8.26	2.93	36.31	7.14	28.72	5.78
55-64 years	7,458,700	-	-	-	8.46	2.97	36.39	7.08	28.98	5.75
65-74 years	4,736,600	-	-	-	8.85	3.01	36.39	7.11	29.36	5.76
75-89 years	1,345,600	-	-	-	9.54	3.15	35.59	6.92	29.3	5.74
Immigrant status										
No	44,908,600	-	-	-	8.04	2.92	35.87	7.10	28.15	5.70
Yes	8,771,800	-	-	-	9.57	2.80	37.94	7.39	31.67	5.55
Income adequacy quintile										
Lowest [ref]	8,561,800	1.000	-	-	8.20	3.06	35.41	7.27	28.27	6.09
2nd	9,838,000	0.790	0.783	0.796	8.37	2.98	36.03	7.20	28.74	5.89
3rd	11,183,700	0.699	0.693	0.704	8.34	2.94	36.28	7.14	28.81	5.79
4th	11,826,600	0.618	0.613	0.623	8.30	2.91	36.45	7.13	28.84	5.73
Highest	12,270,200	0.520	0.515	0.525	8.23	2.89	36.60	7.15	28.86	5.67
Visible minority status										
No [ref]	50,686,400	1.000	-	-	8.22	2.96	36.18	7.19	28.56	5.80
Yes	2,994,000	0.767	0.754	0.780	9.53	2.59	36.63	7.14	31.59	5.45
Indigenous identity										
No [ref]	51,626,800	1.000	-	-	8.41	2.91	36.53	6.97	29.02	5.62

Yes	2,053,600	1.846	1.821	1.872	5.39	2.47	28.19	7.81	21.39	6.05
Employment status										
Employed [ref]	36,100,900	1.000	-	-	8.26	2.90	36.41	7.23	28.84	5.76
Unemployed	2,979,300	1.536	1.513	1.560	7.71	3.05	34.95	7.11	27.42	6.11
Not in labor force	14,600,200	1.707	1.693	1.720	8.49	3.05	35.97	7.06	28.70	5.87
Educational attainment										
< High school graduation [ref]	15,899,500	1.000	-	-	8.07	3.11	35.67	7.31	28.10	6.10
High school, with or without trades certification	19,484,800	0.812	0.807	0.817	8.24	2.92	36.29	7.19	28.63	5.75
Postsecondary nonuniversity	10,165,400	0.691	0.685	0.697	8.39	2.87	36.62	7.20	29.07	5.66
University degree	8,130,600	0.542	0.536	0.548	8.73	2.75	36.52	6.84	29.75	5.43
Occupational class										
Management [ref]	4,106,000	1.000	-	-	8.40	2.84	36.67	7.14	29.24	5.67
Professional	6,596,000	0.888	0.871	0.906	8.50	2.81	36.32	7.02	29.24	5.61
Skilled, technical, and supervisory	12,351,500	1.173	1.154	1.192	8.00	2.92	36.11	7.24	28.36	5.78
Semi-skilled	13,375,900	1.328	1.307	1.350	8.26	2.94	36.47	7.32	28.82	5.86
Unskilled	4,064,600	1.557	1.528	1.586	8.01	3.03	35.69	7.44	28.05	6.09
Not applicable	13,186,400	2.011	1.980	2.043	8.54	3.04	35.99	6.99	28.76	5.84
Community Size										

Pop: > 1,500,000 [ref]	4,106,000	1.000	-	-	8.40	2.84	36.67	7.14	29.24	5.67
Pop: 500,000 – 1,499,999	6,596,000	0.888	0.871	0.906	8.50	2.81	36.32	7.02	29.24	5.61
Pop: 100,000 – 499,999	12,351,500	1.173	1.154	1.192	8.00	2.92	36.11	7.24	28.36	5.78
Pop: 30,000 – 99,999	13,375,900	1.328	1.307	1.350	8.26	2.94	36.47	7.32	28.82	5.86
Pop: 10,000 – 29,999	4,064,600	1.557	1.528	1.586	8.01	3.03	35.69	7.44	28.05	6.09
Non CMA/CA	13,186,400	2.011	1.980	2.043	8.54	3.04	35.99	6.99	28.76	5.84
Airshed										
Western [ref]	6,360,600	1.000	-	-	7.30	2.24	29.38	4.58	23.89	3.43
Prairie	6,990,300	0.950	0.940	0.961	6.16	1.76	32.07	4.42	25.86	3.70
West Central	3,300,200	1.065	1.052	1.080	6.14	1.88	28.85	4.21	23.32	3.82
Southern	5,251,000	1.087	1.075	1.099	5.10	1.72	32.09	2.94	23.11	2.49
Atlantic										
East Central	31,294,500	1.016	1.008	1.025	9.79	2.54	40.17	6.02	32.03	4.70
Northern	483,800	1.211	1.172	1.251	4.44	1.57	24.39	6.61	17.90	4.25
Urban form										
Active urban core [ref]	3,992,700	1.000	-	-	9.70	2.40	35.77	7.05	30.82	5.29
Transit-reliant suburb	3,393,700	0.941	0.929	0.953	10.10	2.29	35.69	6.25	31.66	4.87
Car-reliant suburb	21,755,600	0.870	0.862	0.879	9.28	2.58	37.47	6.87	30.87	5.09
Exurban	3,000,900	0.926	0.912	0.940	7.46	2.59	38.44	7.09	28.99	5.18
Non-CMA/CA	21,537,500	0.956	0.947	0.965	6.86	2.86	34.78	7.36	25.67	5.42
Residential instability (CAN-Marg)										
Q1 (lowest) [ref]	12,382,800	1.000	-	-	7.86	3.02	37.78	7.40	29.22	5.95

Q2	14,248,400	1.012	1.004	1.021	7.83	2.98	36.71	7.62	28.26	5.94
Q3	10,983,500	1.001	0.993	1.010	8.19	3.02	35.02	7.30	27.87	6.09
Q4	9,434,400	0.996	0.987	1.005	8.91	2.77	35.72	6.54	29.14	5.53
Q5 (highest)	6,631,300	1.055	1.045	1.065	9.39	2.42	34.85	5.67	29.64	4.90
Dependence (CAN-Marg)										
Q1 (lowest) ref	8,846,800	1.000	-	-	8.18	2.99	34.88	7.84	28.49	6.51
Q2	8,874,900	0.947	0.937	0.957	8.55	2.88	36.16	7.14	29.17	5.74
Q3	8,647,200	0.948	0.938	0.958	8.83	2.90	37.21	7.23	29.81	5.61
Q4	11,431,400	0.935	0.926	0.944	8.52	2.94	36.91	7.35	29.10	5.64
Q5 (highest)	15,880,000	0.916	0.908	0.924	7.74	2.91	35.91	6.51	27.75	5.53
Material deprivation (CAN-Marg)										
Q1 (lowest) ref	10,904,800	1.000	-	-	8.34	2.73	37.57	7.10	29.69	5.44
Q2	11,214,900	1.063	1.054	1.073	8.64	2.74	37.42	7.35	29.48	5.52
Q3	10,606,300	1.087	1.077	1.097	8.54	2.86	36.74	7.27	29.14	5.55
Q4	9,151,600	1.123	1.113	1.134	8.54	2.92	35.56	7.10	28.73	5.90
Q5 (highest)	11,802,800	1.219	1.208	1.229	7.50	3.28	33.81	6.39	26.74	6.14
Ethnic concentration (CAN-Marg)										
Q1 (lowest) ref	16,887,300	1.000	-	-	7.17	2.79	36.03	6.95	27.10	5.34
Q2	13,207,200	1.012	1.005	1.019	8.20	2.86	36.77	7.30	28.60	5.64
Q3	9,384,600	1.011	1.003	1.020	8.51	2.89	35.57	7.56	28.81	6.11
Q4	7,546,900	1.007	0.998	1.016	9.37	2.74	36.17	7.20	30.44	5.78
Q5 (highest)	6,654,300	1.002	0.993	1.012	9.78	2.68	36.45	6.87	31.05	5.64

[a] Rounded to nearest hundred for confidentiality reasons – sums may not add up to totals.

[b] Hazard ratio for nonaccidental mortality relative to reference category (ref), stratified by age (5-year categories), sex, and immigrant status.

Table A.3. Descriptive statistics of 2001 CanCHEC analytical file, with Cox proportional hazard ratios of nonaccidental mortality, and exposure to three air pollutants (10-year moving average with 1-year lag).

	Person-		95% CI		$PM_{2.5}$		Ozone		O_x	
Characteristic	years[a]	**HR[b]**	**Lower**	**Upper**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
Total	42,775,400	-	-	-	7.72	2.59	36.63	7.37	28.71	5.87
Sex										
Female	22,223,800	-	-	-	7.76	2.59	36.65	7.35	28.77	5.86
Male	20,551,600	-	-	-	7.68	2.60	36.61	7.39	28.64	5.89
Age										
24-35 years	7,956,200	-	-	-	7.57	2.58	36.46	7.55	28.55	6.03
35-44 years	11,581,200	-	-	-	7.61	2.57	36.64	7.42	28.58	5.89
45-54 years	10,426,000	-	-	-	7.67	2.58	36.61	7.32	28.61	5.83
55-64 years	6,623,900	-	-	-	7.78	2.59	36.78	7.22	28.80	5.76
65-74 years	4,439,800	-	-	-	8.02	2.61	36.83	7.21	29.10	5.74
75-89 years	1,748,300	-	-	-	8.43	2.71	36.52	7.39	29.43	5.92
Immigrant status										
No	35,345,100	-	-	-	7.47	2.58	36.26	7.29	28.09	5.75
Yes	7,430,300	-	-	-	8.89	2.31	38.39	7.47	31.62	5.58
Income adequacy quintile										
Lowest [ref]	7,067,000	1.000	-	-	7.69	2.72	35.79	7.42	28.29	6.14
2nd	8,014,500	0.800	0.793	0.807	7.76	2.64	36.38	7.37	28.62	5.96
3rd	8,771,200	0.699	0.693	0.706	7.75	2.59	36.68	7.32	28.73	5.85
4th	9,262,700	0.618	0.611	0.624	7.73	2.55	36.92	7.31	28.83	5.76
Highest	9,660,000	0.518	0.513	0.524	7.68	2.51	37.13	7.36	28.93	5.70
Visible minority status										
No [ref]	37,799,100	1.000	-	-	7.75	2.56	36.97	7.11	28.82	5.61
Yes	4,976,300	1.163	1.149	1.177	7.47	2.83	34.07	8.67	27.86	7.52
Indigenous identity										
No [ref]	40,929,600	1.000	-	-	7.84	2.55	36.99	7.12	29.03	5.65
Yes	1,845,800	1.843	1.815	1.872	5.03	2.18	28.58	8.06	21.52	6.10

Employment status										
Employed [ref]	28,823,800	1.000	-	-	7.72	2.54	36.86	7.38	28.85	5.81
Unemployed	1,711,100	1.606	1.572	1.642	6.89	2.76	34.40	7.40	26.56	6.25
Not in labor force	12,240,500	1.773	1.756	1.790	7.83	2.68	36.41	7.28	28.66	5.90
Educational attainment										
< High school graduation [ref]	11,454,500	1.000	-	-	7.48	2.77	36.03	7.55	28.05	6.17
High school, with or without trades certification	15,482,500	0.810	0.804	0.816	7.66	2.59	36.69	7.39	28.56	5.83
Postsecondary nonuniversity	8,553,900	0.678	0.671	0.685	7.80	2.50	37.03	7.35	29.01	5.72
University degree	7,284,500	0.538	0.532	0.545	8.14	2.37	37.00	6.98	29.69	5.50
Occupational class										
Management [ref]	3,816,900	1.000	-	-	7.84	2.47	37.25	7.32	29.35	5.73
Professional	5,596,100	0.872	0.852	0.892	7.94	2.43	36.79	7.17	29.25	5.66
Skilled, technical, and supervisory	10,292,800	1.185	1.162	1.208	7.49	2.58	36.55	7.43	28.38	5.85
Semi-skilled	9,413,900	1.319	1.293	1.345	7.69	2.60	36.83	7.49	28.74	5.91
Unskilled	2,981,000	1.582	1.545	1.619	7.44	2.71	35.99	7.65	27.92	6.17
Not applicable	10,674,700	2.094	2.056	2.133	7.89	2.68	36.41	7.21	28.69	5.88
Community Size										
Pop: > 1,500,000 [ref]	12,193,500	1.000	-	-	9.33	1.79	37.95	6.11	31.93	4.64

Pop: 500,000 – 1,499,999	7,022,800	0.968	0.958	0.978	7.85	1.84	35.05	6.02	28.86	4.00
Pop: 100,000 – 499,999	7,853,300	1.037	1.027	1.047	8.33	2.83	39.95	8.35	30.32	6.38
Pop: 30,000 – 99,999	4,087,700	1.040	1.028	1.052	7.40	2.57	36.79	6.89	27.34	4.93
Pop: 10,000 – 29,999	1,696,500	1.048	1.031	1.066	5.87	1.99	32.36	7.81	23.87	5.58
Non-CMA/CA	9,921,700	1.070	1.061	1.080	5.62	2.10	34.17	7.45	24.74	5.30
Airshed										
Western [ref]	5,132,300	1.000	-	-	6.61	1.59	29.53	4.66	23.75	3.34
Prairie	5,676,100	0.982	0.970	0.995	5.97	1.72	32.20	4.73	25.72	3.73
West Central	2,570,400	1.095	1.078	1.112	5.73	1.73	28.65	4.39	22.88	3.64
Southern	4,001,700	1.089	1.074	1.103	4.58	1.34	31.80	2.90	22.86	2.46
Atlantic										
East Central	24,988,600	1.009	0.999	1.019	9.12	2.15	40.91	5.75	32.12	4.59
Northern	406,400	1.210	1.165	1.256	4.00	1.13	23.43	6.70	17.24	4.27
Urban form										
Active urban core [ref]	3,232,900	1.000	-	-	9.13	2.01	36.25	7.14	30.70	5.35
Transit-reliant suburb	2,696,100	0.943	0.928	0.957	9.49	1.87	36.300	6.44	31.53	4.97
Car-reliant suburb	17,993,000	0.878	0.868	0.887	8.69	2.16	38.02	6.97	30.78	5.13
Exurban	2,481,300	0.920	0.904	0.936	6.96	2.24	38.80	7.10	28.95	5.20
Non-CMA/CA	16,372,200	0.961	0.950	0.972	6.20	2.45	34.90	7.62	25.53	5.51
Residential instability (CAN-Marg)										
Q1 (lowest) [ref]	10,100,900	1.000	-	-	7.32	2.63	38.32	7.61	29.33	6.04
Q2	11,501,000	1.005	0.996	1.015	7.29	2.64	37.06	7.75	28.25	5.97
Q3	8,649,100	1.001	0.991	1.011	7.57	2.63	35.27	7.48	27.75	6.10

Q4	7,415,500	0.994	0.985	1.005	8.34	2.41	36.12	6.67	29.05	5.56
Q5 (highest)	5,108,900	1.047	1.036	1.058	8.83	2.07	35.38	5.85	29.61	4.96
Dependence (CAN-Marg)										
Q1 (lowest) ref	7,325,500	1.000	-	-	7.44	2.49	34.98	8.12	28.13	6.63
Q2	6,946,000	0.950	0.938	0.962	7.84	2.40	36.42	7.25	29.00	5.78
Q3	6,671,200	0.939	0.928	0.950	8.20	2.51	37.86	7.37	29.94	5.70
Q4	8,893,300	0.913	0.903	0.924	8.02	2.68	37.60	7.49	29.31	5.64
Q5 (highest)	12,939,400	0.896	0.886	0.905	7.36	2.67	36.38	6.65	27.82	5.52
Material deprivation (CAN-Marg)										
Q1 (lowest) ref	8,677,700	1.000	-	-	7.83	2.33	38.03	7.19	29.99	5.37
Q2	8,403,100	1.062	1.051	1.074	8.08	2.35	38.20	7.54	29.88	5.53
Q3	8,398,100	1.092	1.080	1.103	7.91	2.48	37.29	7.42	29.10	5.58
Q4	7,345,300	1.137	1.125	1.149	8.04	2.60	36.14	7.21	28.65	5.84
Q5 (highest)	9,951,200	1.237	1.225	1.249	6.93	2.92	33.90	6.61	26.30	6.10
Ethnic concentration (CAN-Marg)										
Q1 (lowest) ref	14,235,100	1.000	-	-	6.72	2.46	36.49	6.92	27.02	5.20
Q2	10,869,000	1.023	1.015	1.031	7.71	2.57	37.21	7.52	28.48	5.69
Q3	7,537,000	1.021	1.012	1.030	7.92	2.58	35.82	7.91	28.63	6.27
Q4	5,591,200	1.012	1.002	1.023	8.78	2.30	36.50	7.51	30.71	5.85
Q5 (highest)	4,543,100	1.014	1.003	1.026	9.26	2.03	37.21	7.09	32.19	5.36

[a] Rounded to nearest hundred for confidentiality reasons – sums may not add up to totals.

[b] Hazard ratio for nonaccidental mortality relative to reference category (ref), stratified by age (5-year categories), sex, and immigrant status.

Table A.4. Descriptive statistics of fine particulate matter ($PM_{2.5}$) estimates assigned to person-years in stacked CanCHEC for each year of follow up, based on 10-year moving average with 1-year lag.

Year	Mean	Standard Deviation	IQR	Minimum	5th	25th	50th	75th	95th	Maximum
1991	12.20	3.22	4.59	2.49	6.69	9.95	12.29	14.54	17.31	17.74
1992	12.10	3.33	5.00	2.51	6.49	6.49	12.15	14.73	17.25	17.74
1993	11.91	3.34	5.15	2.49	6.30	9.50	11.93	14.65	17.02	17.74
1994	11.57	3.27	5.12	2.47	6.09	9.20	11.58	14.32	16.53	17.74
1995	11.25	3.26	5.13	2.47	5.86	8.85	11.21	13.98	16.23	17.74
1996	10.85	3.22	5.08	2.47	5.59	8.45	10.78	13.53	15.79	17.74
1997	10.49	3.20	5.02	2.47	5.35	8.08	10.37	13.10	15.46	17.74
1998	10.07	3.13	4.91	2.47	5.10	7.69	9.95	12.60	14.92	17.74
1999	9.67	3.04	4.70	2.47	4.88	7.37	9.52	12.07	14.37	17.74
2000	9.22	2.91	4.45	2.47	4.70	7.03	9.03	11.48	13.73	17.73
2001	9.12	3.05	4.58	2.47	4.30	6.91	8.85	11.49	13.85	17.74
2002	8.68	2.90	4.27	2.47	4.07	6.56	8.41	10.83	13.15	17.74
2003	8.33	2.79	4.02	2.47	3.88	6.29	8.13	10.30	12.60	17.69
2004	8.14	2.71	3.91	2.47	3.79	6.12	8.00	10.03	12.29	17.70
2005	7.94	2.61	3.98	2.47	3.68	5.99	7.85	9.97	11.85	17.65
2006	7.91	2.60	4.22	2.47	3.66	5.94	7.79	10.16	11.71	17.10
2007	7.77	2.51	4.13	2.47	3.63	5.87	7.70	10.00	11.36	16.50
2008	7.64	2.46	4.04	2.47	3.57	5.78	7.61	9.82	11.13	16.40
2009	7.52	2.40	3.95	2.47	3.51	5.71	7.52	9.66	10.90	16.00
2010	7.42	2.35	3.79	2.47	3.45	5.64	7.49	9.43	10.80	16.03
2011	7.39	2.28	3.69	2.47	3.52	5.67	7.39	9.36	10.71	16.20
2012	7.35	2.25	3.60	2.47	3.56	5.68	7.34	9.28	10.73	15.60
2013	7.26	2.23	3.51	2.47	3.57	5.61	7.25	9.11	10.82	15.70
2014	7.11	2.20	3.43	2.47	3.51	5.48	7.06	8.91	10.83	14.60
2015	7.02	2.13	3.35	2.47	3.53	5.43	6.98	8.78	10.57	16.70
2016	6.83	2.01	3.17	2.47	3.53	5.33	6.80	8.51	10.13	13.87

Table A.5. Descriptive statistics of the CCHS-mortality cohort (mCCHS) analytical file with Cox proportional hazard ratios of nonaccidental mortality, and exposure to three air pollutants (10-year moving average with 1-year lag).

Characteristic	Person-years[a]	HR[b]	95% CI		$PM_{2.5}$		Ozone		Ox	
			Lower	Upper	Mean	SD	Mean	SD	Mean	SD
Total	4,405,000	-	-	-	6.78	2.50	35.78	7.61	27.03	5.83
Sex										
Female	2,429,900	-	-	-	6.82	2.49	35.82	7.58	27.08	5.81
Male	1,975,100	-	-	-	6.73	2.49	35.73	7.65	26.97	5.86
Age										
24-35 years	791,200	-	-	-	6.75	2.43	35.47	7.65	26.91	5.86
35-44 years	902,900	-	-	-	6.81	2.49	35.77	7.75	27.12	5.95
45-54 years	878,500	-	-	-	6.67	2.49	35.48	7.65	26.76	5.87
55-64 years	854,600	-	-	-	6.69	2.49	35.91	7.50	26.96	5.74
65-74 years	624,900	-	-	-	6.87	2.53	36.21	7.45	27.29	5.70
75-89 years	353,000	-	-	-	7.08	2.58	36.16	7.58	27.50	5.78
Immigrant status										
No	3,896,400	-	-	-	6.62	2.47	35.50	7.50	26.66	5.71
Yes	503,000	-	-	-	7.97	2.36	37.93	8.13	29.89	5.99
Missing	5,500	-	-	-	7.06	2.30	35.23	7.85	27.54	5.92
CCHS cycle										
Cycle 1	1,207,700	-	-	-	6.94	2.66	35.41	7.66	26.96	5.88
Cycle 2	1,003,500	-	-	-	6.89	2.52	35.72	7.83	27.15	6.02
Cycle 3	900,100	-	-	-	6.76	2.49	35.82	7.68	27.15	5.94
2007	13,600	-	-	-	5.75	2.28	33.36	8.40	24.61	6.163
2008	343,700	-	-	-	6.57	2.34	36.04	7.61	26.99	5.81
2009	538,000	-	-	-	6.59	2.30	36.22	7.30	27.02	5.54
2011	398,400	-	-	-	6.51	2.22	36.22	7.04	26.85	5.29
Income adequacy quintile										
Lowest[ref]	776,000	1.000	-	-	6.92	2.58	35.39	7.41	26.97	5.82
2nd	779,400	0.754	0.736	0.772	6.87	2.53	35.97	7.41	27.21	5.72
3rd	800,800	0.637	0.619	0.655	6.84	2.49	36.14	7.53	27.25	5.75
4th	822,300	0.531	0.514	0.549	6.76	2.44	35.99	7.58	27.14	5.78

Highest	901,900	0.439	0.423	0.455	6.59	2.39	35.64	7.87	26.80	5.95
Missing	324,600	0.741	0.718	0.764	6.64	2.55	35.21	8.01	26.63	6.05
Visible minority status										
No [ref]	4,081,500	1.000	-	-	6.77	2.49	35.95	7.47	27.06	5.70
Yes	240,100	0.981	0.931	1.033	7.48	2.45	34.60	8.81	27.93	7.06
Missing	83,400	1.445	1.343	1.555	5.42	2.06	30.95	8.76	23.09	6.40
Indigenous identity										
No [ref]	4,256,100	1.000	-	-	6.83	2.49	35.98	7.48	27.19	5.74
Yes	137,900	1.537	1.453	1.625	5.36	2.12	29.66	8.86	22.33	6.52
Missing	11,000	1.079	0.900	1.295	6.39	2.34	34.76	7.61	26.23	5.71
Employment status										
Employed [ref]	2,680,000	1.000	-	-	6.77	2.46	35.77	7.72	27.06	5.88
Unemployed	112,300	1.665	1.526	1.817	6.62	2.55	34.94	7.56	26.43	5.98
Not in labor force	1,607,000	2.001	1.941	2.063	6.80	2.54	35.86	7.43	27.04	5.74
Missing	5,700	1.522	1.113	2.080	6.22	2.22	33.26	7.20	25.42	5.36
Educational attainment										
< High school graduation [ref]	962,600	1.000	-	-	6.49	2.60	35.11	7.50	26.25	5.82
High school, with or without trades certification	1,909,400	0.775	0.759	0.792	6.74	2.46	35.77	7.62	26.95	5.78
Postsecondary nonuniversity										
University degree	746,800	0.563	0.544	0.583	7.17	2.36	36.14	7.46	27.88	5.74
Missing	35,500	0.996	0.920	1.078	6.74	2.48	35.33	7.68	26.78	5.85

Marital status										
Married or common-law [ref]	2,792,200	1.000	-	-	6.63	2.47	35.89	7.65	26.94	5.82
Separated, widowed or divorced	937,000	1.424	1.396	1.453	7.02	2.53	35.87	7.55	27.26	5.80
Single	672,700	1.561	1.513	1.611	7.06	2.50	35.21	7.50	27.12	5.91
Missing	3,100	1.598	1.217	2.100	6.63	2.29	33.95	7.93	26.12	5.82
Community Size										
Pop: > 1,500,000 [ref]	657,000	1.000	-	-	8.77	1.75	37.31	6.35	30.72	4.66
Pop: 500,000 – 1,499,999	504,000	0.998	0.962	1.036	7.73	1.74	35.69	6.20	28.77	4.12
Pop: 100,000 – 499,999	867,800	1.063	1.030	1.096	7.90	2.62	39.71	8.09	29.78	6.07
Pop: 30,000 – 99,999	568,100	1.081	1.045	1.118	6.82	2.41	36.39	7.02	26.84	4.97
Pop: 10,000 – 29,999	352,500	1.073	1.031	1.117	5.40	1.75	30.96	7.98	22.79	5.55
Non CMA/CA	1,455,600	1.038	1.008	1.068	5.20	1.87	33.70	7.05	24.23	4.92
Airshed										
Western [ref]	512,800	1.000	-	-	6.33	1.55	29.73	5.46	23.34	3.93
Prairie	662,100	0.938	0.906	0.971	5.62	1.64	32.35	4.87	24.95	3.62
West Central	394,200	1.001	0.964	1.039	5.45	1.44	29.84	4.39	22.87	3.31
Southern	698,200	1.028	0.994	1.062	4.26	1.15	31.50	2.83	22.43	2.34
Atlantic										
East Central	2,029,800	0.952	0.926	0.979	8.53	2.15	41.62	5.95	31.50	4.61
Northern	108,000	1.069	0.992	1.151	4.21	1.22	25.04	6.13	18.35	4.11
Urban form										
Active urban core [ref]	302,500	1.000	-	-	8.59	1.97	36.54	7.22	29.82	5.16

Transit-reliant suburb	178,300	0.995	0.944	1.047	8.89	1.89	36.51	6.92	30.46	5.12
Car-reliant suburb	1,236,700	0.816	0.787	0.846	8.21	2.08	38.17	7.12	30.05	5.12
Exurban	215,200	0.817	0.773	0.862	6.54	2.02	38.75	7.03	28.35	5.03
Non-CMA/CA	2,472,200	0.906	0.876	0.937	5.71	2.22	34.18	7.57	24.82	5.36
Residential instability (CAN-Marg)										
Q1 (lowest)	971,800	1.000	-	-	6.22	2.47	36.91	7.76	27.32	5.95
ref										
Q2	1,221,000	0.980	0.954	1.006	6.52	2.53	36.60	8.05	27.07	6.00
Q3	950,600	0.979	0.952	1.006	6.61	2.41	34.08	7.84	25.87	6.04
Q4	775,000	0.962	0.935	0.990	7.29	2.37	35.38	6.87	27.25	5.46
Q5 (highest)	486,600	1.050	1.018	1.083	8.05	2.20	35.44	6.00	28.31	4.85
Dependence (CAN-Marg)										
Q1 (lowest)	688,100	1.000	-	-	6.45	2.29	32.70	8.59	25.52	6.78
ref										
Q2	597,300	0.957	0.922	0.993	6.95	2.34	35.24	7.37	27.19	5.77
Q3	598,500	0.922	0.889	0.956	7.36	2.44	37.25	7.59	28.43	5.71
Q4	939,200	0.897	0.869	0.927	7.18	2.66	37.64	7.56	28.28	5.57
Q5 (highest)	1,581,900	0.873	0.847	0.899	6.40	2.47	35.66	6.77	26.37	5.31
Material deprivation (CAN-Marg)										
Q1 (lowest)	709,000	1.000	-	-	7.05	2.19	37.13	7.62	28.45	5.55
ref										
Q2	773,100	1.023	0.991	1.057	7.32	2.28	37.61	8.29	28.59	5.90
Q3	892,400	1.024	0.993	1.056	7.16	2.33	37.18	7.54	28.02	5.43
Q4	778,300	1.061	1.028	1.095	7.09	2.61	35.45	7.67	27.02	5.93
Q5 (highest)	1,252,100	1.119	1.087	1.152	5.83	2.57	33.09	6.29	24.58	5.34
Ethnic concentration (CAN-Marg)										
Q1 (lowest)	1,820,400	1.000	-	-	5.96	2.25	35.62	6.94	25.93	5.12
ref										
Q2	1,198,900	1.033	1.011	1.055	7.03	2.54	36.49	8.16	27.30	6.03
Q3	742,100	1.032	1.006	1.059	7.11	2.47	35.05	7.90	27.11	6.11

Q4	402,700	1.080	1.044	1.116	8.06	2.33	35.43	8.21	28.88	6.41
Q5 (highest)	240,900	1.060	1.016	1.105	8.58	1.94	36.29	7.39	30.74	5.46
Smoking behavior										
Never smoker [ref]	1,280,300	1.000	-	-	6.91	2.49	36.18	7.61	27.45	5.82
Former smoker	2,039,700	1.306	1.276	1.337	6.72	2.47	35.73	7.51	26.92	5.74
Occasional smoker	175,100	2.091	1.978	2.212	6.80	2.48	35.29	7.74	26.90	6.00
Smoke under 10 cigarettes/day	258,200	2.429	2.334	2.529	6.77	2.53	35.19	7.96	26.72	6.15
Smoke 11-20 cigarettes/day	393,500	2.725	2.630	2.825	6.69	2.54	35.37	7.78	26.65	5.95
Smoke 20+ cigarettes/day	252,100	3.629	3.496	3.768	6.74	2.58	35.76	7.57	26.85	5.82
Missing	6,000	1.504	1.259	1.797	6.53	2.36	35.19	7.63	26.55	5.69
Alcohol consumption										
Never drinker [ref]	385,100	1.000	-	-	6.56	2.50	35.77	7.53	26.86	5.85
Former drinker	440,800	1.094	1.059	1.130	6.66	2.64	35.01	7.84	26.55	6.08
Occasional drinker	830,700	0.834	0.809	0.860	6.65	2.53	35.52	7.62	26.76	5.85
Regular drinker, binging unknown	1,321,800	0.643	0.624	0.661	7.08	2.45	36.49	7.45	27.70	5.67
Regular, non-binge drinker	1,159,100	0.685	0.660	0.711	6.67	2.42	35.48	7.58	26.78	5.77
Regular, binge drinker	257,300	1.070	1.018	1.125	6.71	2.53	35.71	7.94	26.82	6.06

Missing	10,100	0.944	0.817	1.090	6.31	2.36	34.26	7.67	25.95	5.72
Body Mass Index										
Normal weight (18.5-24.9) [ref]	1,411,100	1.000	-	-	6.96	2.47	35.86	7.44	27.28	5.72
Overweight (25.0-29.9)	1,654,400	0.813	0.796	0.831	6.76	2.49	35.84	7.61	27.04	5.82
Obese I (30.0-34.9)	791,300	0.924	0.900	0.949	6.62	2.52	35.70	7.74	26.80	5.91
Obese II (≥35)	350,900	1.320	1.276	1.365	6.53	2.53	35.45	7.90	26.57	6.01
Underweight (<18)	57,200	2.108	1.984	2.238	7.13	2.50	35.71	7.33	27.35	5.66
Missing	140,000	1.604	1.532	1.679	6.59	2.49	35.59	7.88	26.79	5.98
Fruit and vegetable consumption										
Under 5 servings/day [ref]	2,384,600	1.000	-	-	6.76	2.52	35.83	7.80	27.06	5.94
5+ servings/day	1,568,400	0.823	0.807	0.839	6.97	2.45	36.40	7.65	27.53	5.80
Missing	452,000	1.184	1.151	1.219	6.22	2.41	33.35	5.77	25.14	4.88
Leisure exercise frequency										
Active [ref]	996,100	1.000	-	-	6.78	2.41	35.84	7.72	27.09	5.80
Moderate	1,113,600	1.098	1.064	1.133	6.80	2.45	35.85	7.61	27.09	5.80
Inactive	2,198,100	1.682	1.638	1.727	6.77	2.55	35.76	7.56	27.00	5.86
Missing	97,200	2.485	2.378	2.596	6.67	2.53	34.90	7.62	26.53	5.81

[a] Rounded to nearest hundred for confidentiality reasons – sums may not add up to totals.

[b] Hazard ratio for nonaccidental mortality relative to reference category (ref), stratified by age (5-year categories), sex, CCHS cycle, and immigrant status.

Table A.6. Sensitivity analysis: Cox proportional hazard ratios of nonaccidental mortality and exposure to $PM_{2.5}$ in fully adjusted models among different CanCHEC cohorts and mCCHS, using both the original Version 1 and Version 2-MAPLE of $PM_{2.5}$ data, 10-year moving average with 1-year lag[a]

Cohort	PM version	Deaths[b]	Coeff	SE	HR[c]	Lower CI	Upper CI
1991 CanCHEC	V1	530,500	0.0055	0.0007	1.057	1.042	1.071
	V2-maple	531,300	0.0068	0.0008	1.070	1.053	1.086
1996 CanCHEC	V1	537,000	0.0070	0.0007	1.073	1.057	1.088
	V2-maple	537,400	0.0073	0.0008	1.076	1.058	1.094
2001 CanCHEC	V1	400,500	0.0115	0.0010	1.122	1.100	1.143
	V2-maple	401,000	0.0103	0.0011	1.109	1.086	1.132
mCCHS without behavior[d]	V1	49,900	0.0121	0.0030	1.129	1.066	1.196
	V2-maple	50,100	0.0116	0.0031	1.123	1.056	1.194

[a] Fully adjusted models are stratified by sex, age (5-year categories) and recent immigrant status, and adjusted for income adequacy quintile, visible minority status, Indigenous identity, educational attainment, labor force status, marital status, occupation, and ecological covariates of community size, airshed, urban form, and 4 dimensions of Can-Marg (instability, deprivation, dependency, and ethnic concentration). mCCHS analyses were also stratified by CCHS cycle.

[b] Deaths were rounded to nearest 100 for confidentiality.

[c] Hazard ratios presented per increase of 10 $\mu g/m^3$.

[d] Behavioral covariates include additional adjustment for smoking, alcohol consumption, fruit and vegetable consumption, body mass index category, and exercise behavior.

Table A.7. Sensitivity analysis: Cox proportional hazard ratios of nonaccidental mortality for exposure to $PM_{2.5}$ in fully adjusted[a] models among different CanCHEC cohorts using both the original Version 1 and Version 2-MAPLE of $PM_{2.5}$ data, 3-year moving average with 1-year lag.

Cohort	PM version	Deaths[b]	Coeff.	SE	HR[c]	Lower CI	Upper CI
1991 CanCHEC	V1	541,800	0.0043	0.0007	1.043	1.029	1.058
	V2-maple	542,900	0.0030	0.0008	1.030	1.014	1.046
1996 CanCHEC	V1	543,900	0.0064	0.0008	1.066	1.051	1.082
	V2-maple	544,400	0.0031	0.0009	1.031	1.014	1.049
2001 CanCHEC	V1	402,100	0.0095	0.0010	1.099	1.079	1.120
	V2-maple	402,700	0.0036	0.0011	1.036	1.014	1.059

[a] Fully adjusted models are stratified by sex, age (5-year categories) and recent immigrant status, and adjusted for income adequacy quintile, visible minority status, Indigenous identity, educational attainment, labor force status, marital status, occupation, and ecological covariates of community size, airshed, urban form, and 4 dimensions of Can-Marg (instability, deprivation, dependency, and ethnic concentration).

[b] Deaths were rounded to nearest 100 for confidentiality.

[c] Hazard ratios presented per increase of 10 $\mu g/m^3$.

Appendix B. Tables with Hazard Ratios Rescaled by IQR

Table B.1. (HRs scaled by IQR) Cox proportional hazard ratios of nonaccidental mortality in fully adjusted models in CanCHEC and mCCHS, using both $PM_{2.5}$ and O_3 in the same models[a]

Cohort	Deaths[b]	Pollutant	Coeff	SE	IQR	HR[c]	Lower CI	Upper CI
Stacked	1,253,300	$PM_{2.5}$	0.0038	0.0006	4.16	1.016	1.011	1.021
		O_3	0.0036	0.0002	9.48	1.034	1.031	1.039
1991	531,300	$PM_{2.5}$	0.0040	0.0009	4.49	1.018	1.010	1.026
CanCHEC		O_3	0.0024	0.0003	9.06	1.022	1.017	1.027
1996	537,400	$PM_{2.5}$	0.0017	0.0009	4.13	1.007	0.999	1.014
CanCHEC		O_3	0.0045	0.0003	9.65	1.044	1.039	1.050
2001	401,000	$PM_{2.5}$	0.0033	0.0012	3.88	1.013	1.004	1.022
CanCHEC		O_3	0.0054	0.0004	9.86	1.055	1.047	1.063
mCCHS	50,100	$PM_{2.5}$	0.0064	0.0035	3.80	1.025	0.998	1.051
without behavior[d]		O_3	0.0036	0.0011	9.91	1.036	1.015	1.058
mCCHS	50,100	$PM_{2.5}$	0.0016	0.0035	3.80	1.006	0.979	1.033
with behavior[d]		O_3	0.0045	0.0011	9.91	1.046	1.022	1.070

[a] Fully adjusted models are stratified by sex, age (5-year categories) and recent immigrant status, and adjusted for income adequacy quintile, visible minority status, Indigenous identity, educational attainment, labor force status, marital status, occupation, and ecological covariates of community size, airshed, urban form, and 4 dimensions of Can-Marg (instability, deprivation, dependency, and ethnic concentration). Stacked CanCHEC were also stratified by CanCHEC, and mCCHS analyses were also stratified by CCHS cycle.

[b] Deaths were rounded to nearest 100 for confidentiality.

[c] Hazard ratios presented per increase of IQR.

[d] Behavioral covariates include additional adjustment for smoking, alcohol consumption, fruit and vegetable consumption, body mass index category, and exercise behavior.

Table B.2. (HRs scaled by IQR) Sensitivity analysis: Cox proportional hazard ratios of cardiovascular and respiratory mortality in fully adjusted models in the stacked CanCHEC, using both $PM_{2.5}$ and O_3 in the same models[a]

Cause of death	Deaths[b]	Pollutant	Coeff	SE	IQR	HR[c]	Lower CI	Upper CI
Cardiovascular	390,600	$PM_{2.5}$	0.0047	0.0011	4.16	1.020	1.011	1.029
		O_3	0.0088	0.0004	9.48	1.087	1.079	1.095
Respiratory	105,900	$PM_{2.5}$	0.0027	0.0021	4.16	1.011	0.994	1.029
		O_3	0.0039	0.0007	9.48	1.038	1.024	1.051

[a] Fully adjusted models are stratified by sex, age (5-year categories), CanCHEC year, and recent immigrant status, and adjusted for income adequacy quintile, visible minority status, Indigenous identity, educational attainment, labor force status, marital status, occupation, and ecological covariates of community size, airshed, urban form, and 4 dimensions of Can-Marg (instability, deprivation, dependency, and ethnic concentration).

[b] Deaths were rounded to nearest 100 for confidentiality.

[c] Hazard ratios presented per increase of IQR.

Table B.3. (HRs scaled by IQR) Sensitivity analysis: Cox proportional hazard ratios of nonaccidental mortality in fully adjusted models using both $PM_{2.5}$ and O_x in the same models[a]

Cohort	Deaths[b]	Pollutant	Coeff	SE	IQR	HR[c]	Lower CI	Upper CI
Stacked	1,253,300	$PM_{2.5}$	0.0022	0.0006	4.16	1.096	1.091	1.101
		O_x	0.0053	0.0003	9.06	1.049	1.044	1.055
1991 CanCHEC	531,300	$PM_{2.5}$	0.0031	0.0009	4.49	1.014	1.006	1.022
		O_x	0.0034	0.0004	8.97	1.031	1.024	1.038
1996 CanCHEC	537,400	$PM_{2.5}$	<0.0001	0.0010	4.13	1.000	0.992	1.009
		O_x	0.0064	0.0005	9.12	1.060	1.051	1.069
2001 CanCHEC	401,000	$PM_{2.5}$	0.0003	0.0013	3.88	1.001	0.991	1.011
		O_x	0.0081	0.0006	9.23	1.078	1.067	1.089
mCCHS without behavior[d]	50,100	$PM_{2.5}$	0.0038	0.0040	3.80	1.036	0.962	1.110
		O_x	0.0061	0.0016	7.68	1.048	1.023	1.073
mCCHS with behavior[d]	50,100	$PM_{2.5}$	-0.0005	0.0038	3.80	0.998	0.969	1.027
		O_x	0.0068	0.0016	7.68	1.053	1.029	1.078

[a] Fully adjusted models are stratified by sex, age (5-year categories) and recent immigrant status, and adjusted for income adequacy quintile, visible minority status, Indigenous identity, educational attainment, labor force status, marital status, occupation, and ecological covariates of community size, airshed, urban form, and 4 dimensions of Can-Marg (instability, deprivation, dependency, and ethnic concentration). Stacked CanCHEC analyses were also stratified by CanCHEC year, and mCCHS analyses were also stratified by CCHS cycle.

[b] Deaths were rounded to nearest 100 for confidentiality.

[c] Hazard ratios presented per increase of 10 $\mu g/m^3$.

[d] Behavioral covariates include additional adjustment for smoking, alcohol consumption, fruit and vegetable consumption, body mass index category, and exercise behavior.

Table B.4. (HRs scaled by IQR) Sensitivity analysis: Cox proportional hazard ratios of cardiovascular and respiratory mortality in fully adjusted models in the stacked CanCHEC, using both $PM_{2.5}$ and O_x in the same models[a]

Cause of death	Deaths[b]	Pollutant	Coeff	SE	IQR	HR[c]	Lower CI	Upper CI
Cardiovascular	390,600	$PM_{2.5}$	0.0024	0.0011	4.16	1.010	1.001	1.019
		O_x	0.0116	0.0005	9.06	1.111	1.102	1.120
Respiratory	105,900	$PM_{2.5}$	0.0010	0.0022	4.16	1.004	0.986	1.022
		O_x	0.0056	0.0010	9.06	1.052	1.034	1.070

[a] Fully adjusted models are stratified by sex, age (5-year categories), CanCHEC year, and recent immigrant status, and adjusted for income adequacy quintile, visible minority status, Indigenous identity, educational attainment, labor force status, marital status, occupation, and ecological covariates of community size, airshed, urban form, and 4 dimensions of Can-Marg (instability, deprivation, dependency, and ethnic concentration).

[b] Deaths were rounded to nearest 100 for confidentiality.

[c] Hazard ratios presented per increase of 10 $\mu g/m^3$.

Appendix C. Figures

Shapes of eSCHIF for 1991, 1996, 2001 and mCCHS for $PM_{2.5}$, adjusted for O_3:

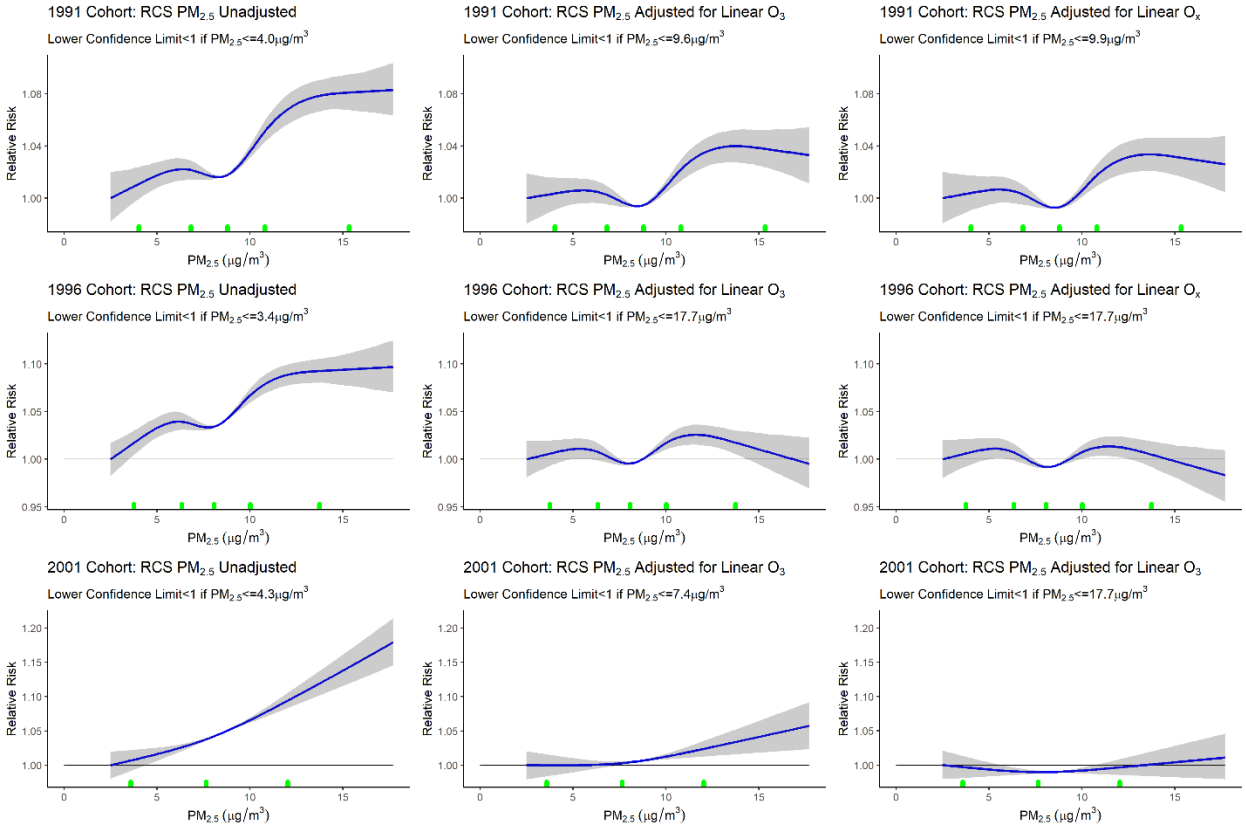
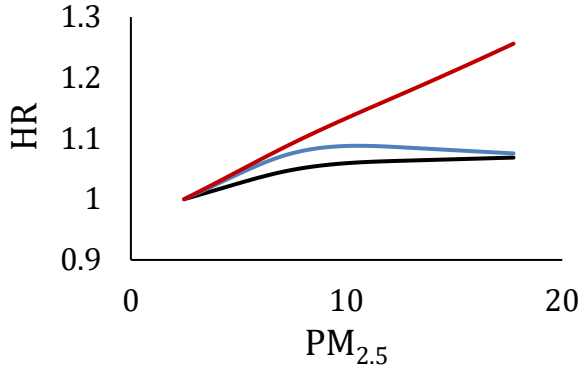
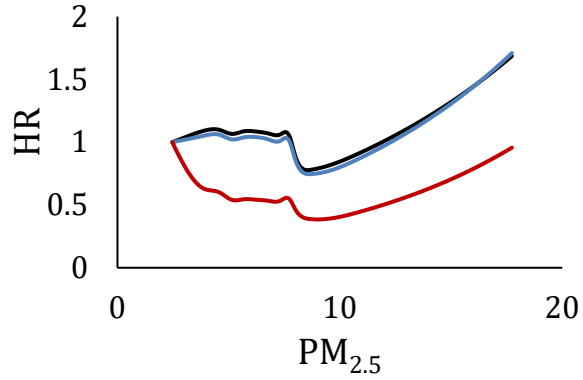


Figure C.1. RCS based relative risk predictions by $PM_{2.5}$ concentration ($\mu g/m^3$) for the 1991 (top three panels), 1996 (middle three panels), and 2001 (bottom three panels) cohorts. RCS is unadjusted for either O_3 or O_x in left hand panels, adjusted for linear term of O_3 (middle three panels), or linear term for O_x (three right hand panels). Mean predictions displayed as solid blue line with 95% confidence intervals as grey shaded area. Knot locations displayed as x-axis green tick marks.

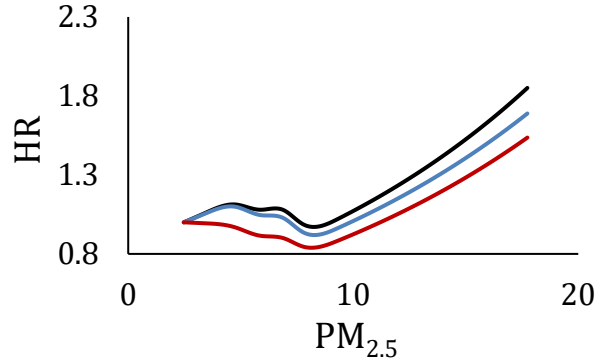
Western Airshed



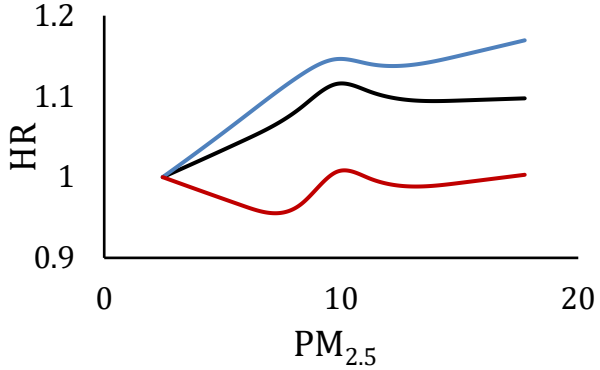
West Central Airshed



Prairie Airshed



East Central Airshed



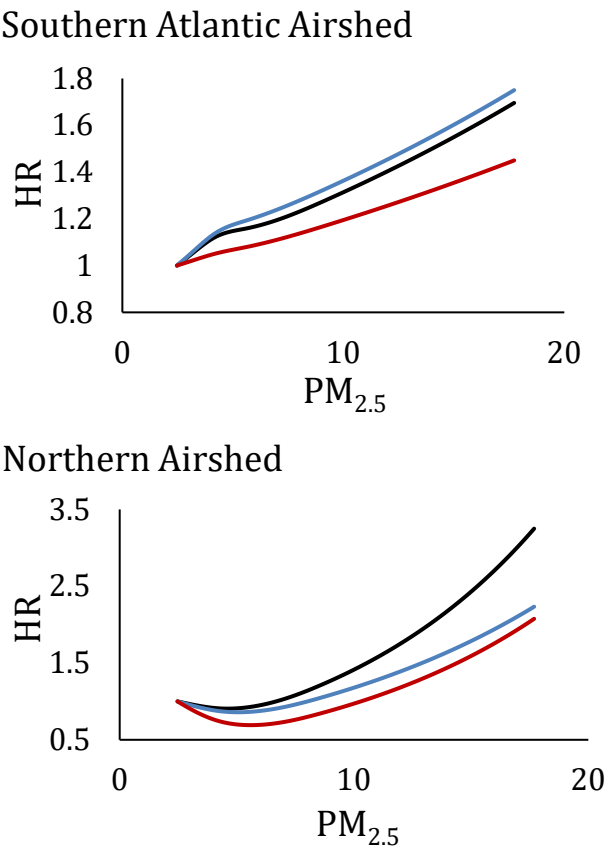


Figure C.2. Sensitivity analyses for different levels of model adjustment of Restricted Cubic Spline (RCS) models for nonaccidental mortality within each of 6 airsheds. Results of RCS on stacked CanCHEC, using BIC on the fully adjusted model for the best fitting spline. Red line – stratified by age, sex, immigrant status and CanCHEC year, Blue line – strata + adjusted for individual covariates, Black line – strata + individual covariates + contextual covariates (i.e., fully adjusted model).