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Supplemental Material

A Longitudinal Study on the Impact of Indoor Temperature on Heat-Related Symptoms in Older Adults Living in Non-Air-Conditioned Households

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Table S1: Baseline characteristics of study population (n=277) in Montérégie, Quebec. Percentages and totals are provided for categorical variables.

Age (SD^a)	72.82 (7.03)
Median Age (Min, Max)^b	73 (60, 95)
Sex	
Male	19.90% (55)
Female	80.10% (222)
Education level	
Primary school	23.10% (64)
High School	35% (97)
College, University	41.20% (114)
Other	0.70% (2)
Income^c	
Insufficient financial resources	40.10% (106)
Sufficient financial resources	59.90% (166)
Self-reported Health	
Reported existing health issues	64.50%
Did not report any existing health issue	35.50%
Employment status	
Full time	1.10% (3)
Part time	0.40% (1)
Unemployed	1.10% (3)
Sick leave	0.70% (2)
Retired	93.50% (259)
Living Alone	
Yes	80.90% (224)
No	19.10% (53)
Study Year	
2017	58.80% (163)
2018	41.20% (114)

^a **SD : Standard Deviation**

^b **Min : Minimum ; Max : Maximum**

^c **Income: Refuse/ Do not know (n=5)**

Table S2: Unadjusted and adjusted effect estimates and 95% confidence intervals for each outcome. T1 is the cool temperature period (18°C-22°C), T2 is the warmer temperature period (28°C-30°C), and T3 is the warmest temperature period (30°C-33°C) in Montréal, Quebec.

Outcome		Unadjusted models ^a			Adjusted models		
		RR	LCI ^b	UCI ^b	RR	LCI	UCI
Fatigue	Ref:T1						
	T2	1.828	1.400	2.387	1.781	1.357	2.337
	T3	2.336	1.807	3.021	2.289	1.762	2.974
Headache	Ref:T1						
	T2	1.083	0.753	1.558	1.126	0.772	1.640
	T3	1.189	0.812	1.741	1.247	0.843	1.843
Cramps	Ref:T1						
	T2	1.321	1.022	1.708	1.290	0.995	1.673
	T3	1.399	1.083	1.807	1.369	1.057	1.773
Dry mouth	Ref:T1						
	T2	2.136	1.501	3.040	1.999	1.397	2.860
	T3	2.546	1.811	3.580	2.476	1.754	3.495
Trouble sleeping	Ref:T1						
	T2	1.429	1.005	2.031	1.438	1.008	2.051
	T3	2.240	1.602	3.132	2.240	1.591	3.151
Lightheadedness	Ref:T1						
	T2	1.078	0.739	1.572	1.008	0.684	1.485
	T3	1.408	0.957	2.072	1.361	0.920	2.013
Loss of consciousness	Ref:T1						
	T2	0.770	0.289	2.054	0.620	0.223	1.727
	T3	1.794	0.786	4.091	1.784	0.782	4.068
Nausea	Ref:T1						
	T2	1.284	0.601	2.744	1.278	0.580	2.814
	T3	2.444	1.272	4.698	2.567	1.302	5.061
Less frequent urination	Ref:T1						
	T2	2.430	1.164	5.074	2.352	1.114	4.966
	T3	3.889	1.966	7.692	3.653	1.816	7.346
Dark urine	Ref:T1						
	T2	2.227	1.400	3.542	2.236	1.392	3.591

	T3	1.921	1.195	3.088	1.915	1.177	3.115
Anxiety	Ref:T1						
	T2	1.445	0.950	2.197	1.347	0.874	2.075
	T3	1.452	0.986	2.139	1.500	1.009	2.228
Depressive symptoms	Ref:T1						
	T2	1.586	1.000	2.516	1.561	0.972	2.506
	T3	1.277	0.809	2.015	1.283	0.805	2.044
Thirst	Ref:T1						
	T2	2.019	1.486	2.743	2.001	1.469	2.725
	T3	3.440	2.588	4.573	3.389	2.544	4.515

^a GEE Poisson Models with Robust Variance. Adjusted for Year, Self-rated health, living alone, Gender, Age, Education and Income

^bLCI: Lower 95% Confidence Interval; UCI: Upper 95% Confidence Interval

Table S3 - Effect measure modification by pre-existing health conditions for participants living in Montérégie, Quebec. RERI and 95% confidence intervals are included.

Self-reported Health Condition	Heat-Related Symptoms	RERI	95% LCI	95% UCI
Diabetes				
	Fatigue	0.709	0.014	1.403
	Headache	-0.503	-1.375	0.370
	Cramps	-0.269	-1.082	0.544
	Dry mouth	0.135	-0.943	1.213
	Trouble sleeping	0.204	-0.789	1.197
	Lightheadedness	-0.114	-1.125	0.896
	Nausea	-0.070	-2.486	2.346
	Less frequent urination			
	Dark urine	-0.333	-1.567	0.900
	Anxiety	0.088	-0.860	1.035
	Depressive symptoms	0.108	-0.959	1.175
	Thirst	-0.667	-1.756	0.422
Cardiovascular Diseases				
	Fatigue	0.105	-0.880	1.090
	Headache	-0.327	-1.856	1.202
	Cramps	0.286	-0.435	1.007
	Dry mouth	0.328	-1.223	1.878
	Trouble sleeping	0.209	-1.050	1.467
	Lightheadedness	-0.888	-2.692	0.916
	Nausea	-1.950	-5.671	1.771
	Less frequent urination	1.711	-1.579	5.001
	Dark urine	-1.174	-3.541	1.193
	Anxiety	-0.864	-2.451	0.722
	Depressive symptoms	0.442	-1.128	2.012
	Thirst	-0.253	-1.282	0.775
Respiratory Diseases				
	Fatigue	-0.324	-1.454	0.807
	Headache	-0.525	-1.844	0.793
	Cramps	-0.023	-0.903	0.857
	Dry mouth	0.208	-1.418	1.834
	Trouble sleeping	-0.605	-2.050	0.839
	Lightheadedness	-1.390	-3.970	1.190

	Nausea	1.548	-1.652	4.748
	Less frequent urination	1.045	-1.994	4.084
	Dark urine	-1.503	-4.081	1.076
	Anxiety	-0.926	-2.978	1.125
	Depressive symptoms	-0.250	-2.488	1.987
	Thirst	0.167	-0.886	1.220
Kidney Diseases				
	Fatigue	0.247	-0.767	1.261
	Headache	-0.389	-1.952	1.173
	Cramps	0.325	-0.452	1.101
	Dry mouth	-0.917	-2.567	0.733
	Trouble sleeping	-0.961	-2.828	0.905
	Lightheadedness	-0.739	-2.218	0.739
	Nausea	-1.761	-5.513	1.990
	Less frequent urination	1.921	-5.271	9.114
	Dark urine	-0.769	-2.990	1.453
	Anxiety	0.139	-1.006	1.283
	Depressive symptoms	-0.054	-2.570	2.462
	Thirst	-0.649	-2.004	0.706
Neurological Diseases				
	Fatigue	-1.199	-2.688	0.290
	Headache	-0.163	-2.056	1.731
	Cramps	0.071	-0.915	1.058
	Dry mouth	-0.467	-2.103	1.170
	Trouble sleeping	0.973	-1.267	3.213
	Lightheadedness	-0.608	-2.645	1.428
	Nausea	-1.153	-6.004	3.697
	Less frequent urination			
	Dark urine	-0.577	-2.474	1.320
	Anxiety	-2.572	-5.370	0.226
	Depressive symptoms			
	Thirst	0.850	-0.343	2.042
Cancer				
	Fatigue	0.687	-0.267	1.642
	Headache	0.036	-1.596	1.667
	Cramps	0.186	-0.863	1.234

Dry mouth	-0.609	-2.310	1.093
Trouble sleeping	0.638	-0.922	2.198
Lightheadedness	-0.108	-1.904	1.689
Nausea	-0.909	-3.871	2.053
Less frequent urination	1.437	-5.770	8.643
Dark urine	-1.613	-3.283	0.057
Anxiety	-1.151	-2.873	0.572
Depressive symptoms	-1.535	-3.342	0.272
Thirst	0.123	-1.177	1.422

*relative risks due to interaction; LCI: Lower Confidence Interval; UCI: Upper Confidence Interval

Table S4: Estimated marginal probabilities used the symptoms presented in Figure 2 for participants living in Montérégie, Quebec.

Thirst				Trouble Sleeping			
Temperature Unit	Estimated Marginal Probability	95% Confidence Interval		Estimated Marginal Probability	95% Confidence Interval		
		Lower	Upper		Lower	Upper	
10	0.113	0.033	0.193	10	0.029	-0.002	0.060
11	0.120	0.039	0.200	11	0.032	-0.001	0.065
12	0.127	0.047	0.207	12	0.036	0.002	0.071
13	0.134	0.055	0.214	13	0.041	0.004	0.077
14	0.142	0.064	0.221	14	0.045	0.007	0.084
15	0.151	0.073	0.228	15	0.051	0.011	0.091
16	0.160	0.084	0.236	16	0.057	0.016	0.098
17	0.169	0.095	0.243	17	0.064	0.021	0.106
18	0.179	0.108	0.251	18	0.071	0.028	0.114
19	0.190	0.121	0.259	19	0.079	0.035	0.123
20	0.201	0.136	0.267	20	0.089	0.045	0.133
21	0.213	0.151	0.275	21	0.099	0.055	0.143
22	0.226	0.168	0.284	22	0.111	0.068	0.154
23	0.239	0.186	0.293	23	0.124	0.083	0.166
24	0.254	0.205	0.302	24	0.139	0.100	0.178
25	0.269	0.224	0.313	25	0.155	0.119	0.192
26	0.285	0.243	0.327	26	0.174	0.140	0.208
27	0.302	0.260	0.343	27	0.194	0.162	0.227
28	0.320	0.276	0.364	28	0.217	0.184	0.251
29	0.339	0.288	0.389	29	0.243	0.203	0.283
30	0.359	0.298	0.420	30	0.272	0.219	0.324
31	0.380	0.305	0.455	31	0.304	0.233	0.375
32	0.403	0.311	0.495	32	0.340	0.245	0.435
33	0.427	0.315	0.538	33	0.380	0.254	0.506
34	0.452	0.318	0.586	34	0.425	0.262	0.589
35	0.479	0.320	0.638	35	0.476	0.267	0.684
36	0.508	0.320	0.695	36	0.532	0.269	0.795
37	0.538	0.319	0.757	37	0.595	0.267	0.923

Dry Mouth				Less Urination			
	Estimated Marginal Probability	95% Confidence Interval			Estimated Marginal Probability	95% Confidence Interval	
		Lower	Upper			Lower	Upper
10	0.045	-0.003	0.094	10	0.029	-0.002	0.060
11	0.049	-0.001	0.099	11	0.032	-0.001	0.065
12	0.053	0.002	0.104	12	0.036	0.002	0.071
13	0.058	0.006	0.110	13	0.041	0.004	0.077
14	0.063	0.010	0.116	14	0.045	0.007	0.084
15	0.068	0.015	0.122	15	0.051	0.011	0.091
16	0.074	0.021	0.128	16	0.057	0.016	0.098
17	0.081	0.027	0.135	17	0.064	0.021	0.106
18	0.088	0.034	0.142	18	0.071	0.028	0.114
19	0.096	0.043	0.148	19	0.079	0.035	0.123
20	0.104	0.052	0.156	20	0.089	0.045	0.133
21	0.113	0.063	0.163	21	0.099	0.055	0.143
22	0.123	0.075	0.171	22	0.111	0.068	0.154
23	0.133	0.088	0.179	23	0.124	0.083	0.166
24	0.145	0.103	0.187	24	0.139	0.100	0.178
25	0.158	0.119	0.197	25	0.155	0.119	0.192
26	0.171	0.135	0.208	26	0.174	0.140	0.208
27	0.186	0.151	0.221	27	0.194	0.162	0.227
28	0.202	0.165	0.239	28	0.217	0.184	0.251
29	0.220	0.177	0.263	29	0.243	0.203	0.283
30	0.239	0.186	0.292	30	0.272	0.219	0.324
31	0.260	0.192	0.328	31	0.304	0.233	0.375
32	0.282	0.196	0.369	32	0.340	0.245	0.435
33	0.307	0.198	0.416	33	0.380	0.254	0.506
34	0.333	0.197	0.469	34	0.425	0.262	0.589
35	0.362	0.195	0.530	35	0.476	0.267	0.684
36	0.394	0.190	0.597	36	0.532	0.269	0.795
37	0.428	0.183	0.673	37	0.595	0.267	0.923

Figure S1. Directed acyclic graph utilized to identify which covariates to condition on to sufficiently close identified backdoor paths.

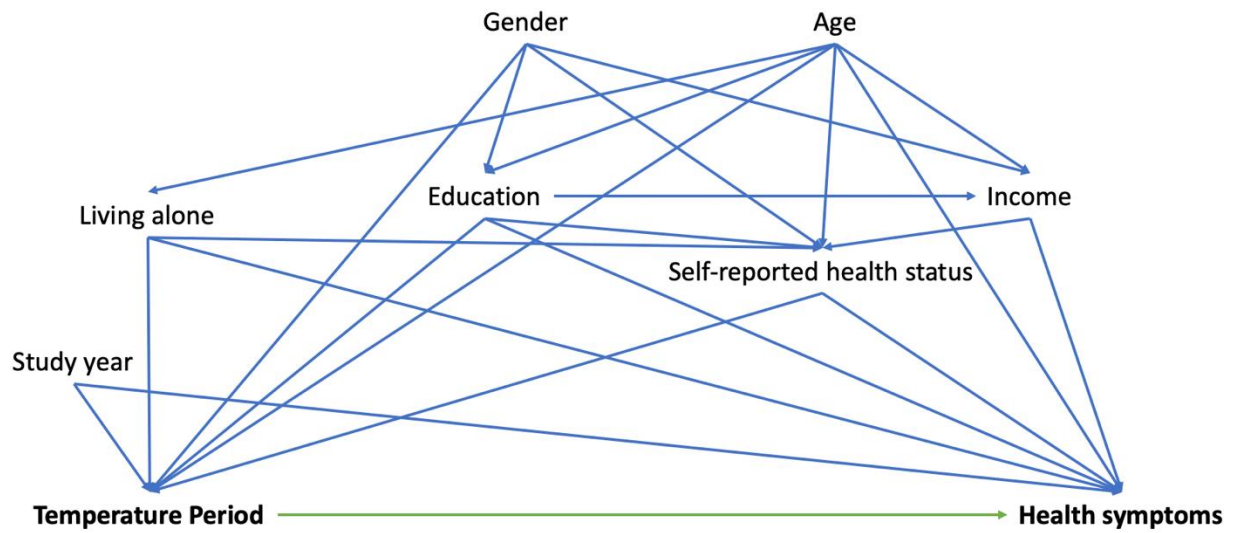


Figure S2. Probability of other symptoms with increasing maximum temperature in Celsius (°C) for participants living in Montérégie, Quebec. The probability point estimate is provided as the point, while the error bars provide the 95% confidence intervals for these probabilities. Models did not converge for the following symptoms: Anxiety, depressive symptoms, headache, loss of consciousness, and nausea.

