

Online Appendix

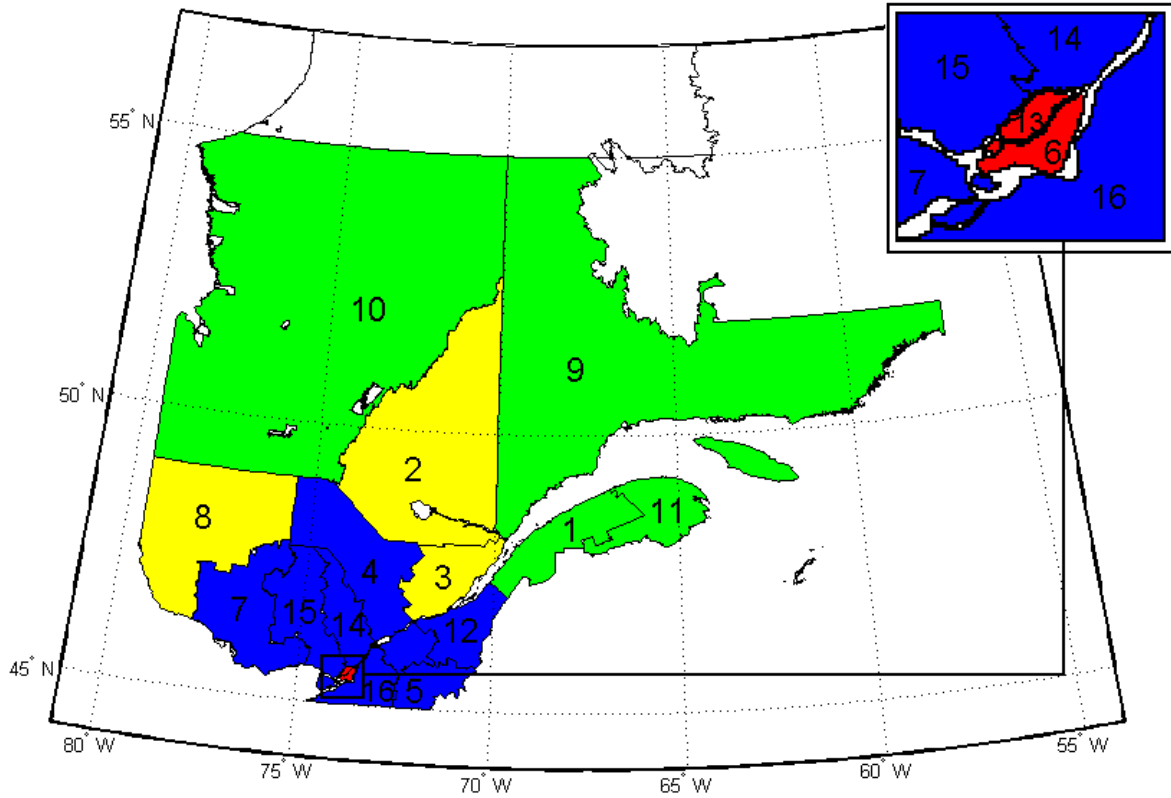


Figure: Homogenous meteorological clustering of Québec Health regions. Red = metropolitan Montréal; blue = southern Québec; yellow = central Québec; green = maritime and northern Québec. Region 10 is excluded from the present study. From Martel et al, 2010 (8).

Table: Grouping of health administrative regions into study areas. The total population and the population over 15 years old are provided by the 2001 Canadian census.

Area	Provincial health administrative region	Total population	Population age 15 and over
Area 1	Montréal, Laval	2,200,779	1,843,135
Area 2	Mauricie et Centre du Québec, Estrie, Outaouais, Chaudière-Appalaches, Lanaudière, Laurentides, Montérégie	3,670,463	2,980,452
Area 3	Saguenay Lac-St-Jean, Capitale-Nationale, Abitibi-Témiscamingue	1,083,384	905,275
Total	All the above regions	6,954,626	5,728,862

Table: Total visits to the emergency department for mental and psychosocial problems by age for warm season (May to September) from 1995-2007, stratified by age in years and sex.

Area	15-24	25-44	45-64	65-75	>75	Male	Female	Total
1	17,461	59,268	36,256	7,653	7,601	65,625	62,614	128,239
2	25,571	68,910	43,136	7,711	7,723	78,542	74,509	153,051
3	9,900	28,899	19,642	4,008	3,813	33,221	33,041	66,262
Total	52,932	157,077	99,034	19,372	19,137	177,388	170,164	347,552

Table: Descriptive statistics of the daily mean temperature and daily mean relative humidity, for warm season (May to September) from 1995-2007, by grouped areas.

Area	Temperature Humidity	Lowest during period	Q1	Median	Mean of daily means	Q3	Highest during period
1	°C	5.1	15.3	18.4	17.8	20.8	27.8
	%	37.3	67.1	73.1	71.9	78.0	94.6
2	°C	4.2	14.4	17.4	16.9	19.9	26.9
	%	42.7	69.5	75.0	73.8	79.3	93.8
3	°C	3.4	12.7	15.9	15.3	18.3	25.4
	%	43.7	69.0	74.2	73.2	78.5	91.9

Notes:

Daily mean temperature or humidity = (daily maximum + daily minimum) / 2.

Lowest during period = lowest daily mean temperature or humidity during period.

Q1 and Q3 = first and third quartiles of daily mean temperature or humidity during period; 50% of data are found between these values.

Median = median of daily mean temperature or humidity during period.

Mean = mean of daily mean temperature or humidity during period.

Highest during period = highest daily mean temperature or humidity during period.

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Table: Incidence rate ratio (IRR) for mean daily relative humidity.

Area	Age	IRR at 70%		IRR at 80%		IRR at 90%	
		IRR	95% CI	IRR	95% CI	IRR	95% CI
1	<65	1.00	.99-1.00	1.02	1.01-1.02	1.04	1.01-1.06
	≥65	1.00	1.00-1.00	1.01	.99-1.02	1.01	.99-1.03
2	<65	.99	.98-1.00	1.00	.99-1.01	1.10	1.05-1.14
	≥65	1.00	1.00-1.00	1.00	1.00-1.00	1.00	1.00-1.00
3	<65	.99	.98-1.00	1.02	1.01-1.04	1.04	.98-1.10
	≥65	1.01	.99-1.02	.99	.96-1.01	.97	.91-1.04

Note:

Bold IRR indicate statistical significance by 95% confidence interval prior to rounding to 2 decimal places.

Figures:

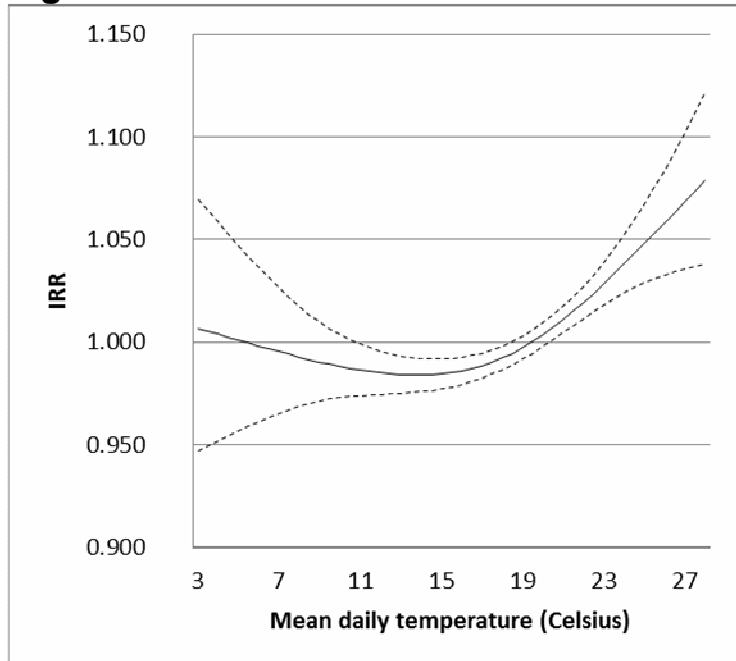


Figure: Incidence rate ratio (IRR) of daily emergency department visits by mean daily temperature among persons under age 65 in Area 1.

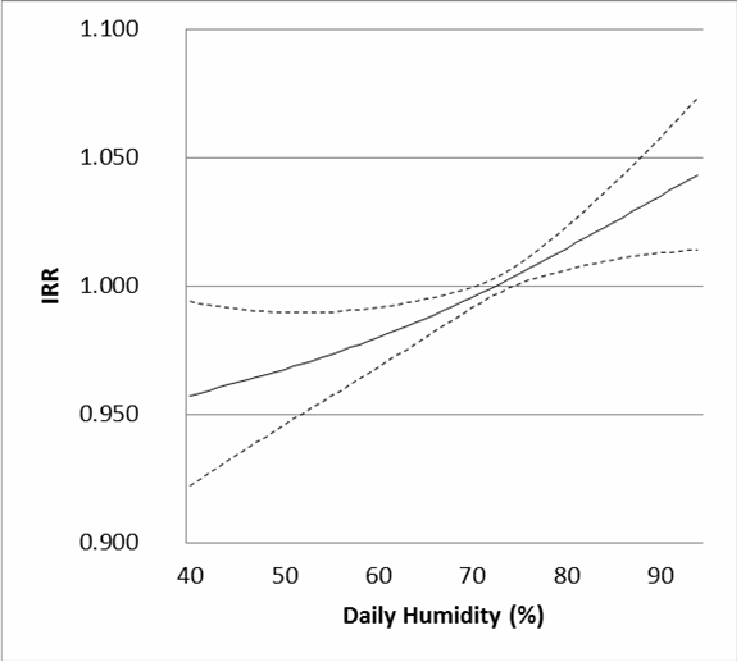


Figure: Incidence rate ratio (IRR) of daily emergency department visits by relative humidity among persons under age 65 in Area 1.

Additional references on vulnerability to environmental heat among persons with mental health problems:

1. Chong TW, Castle DJ. Layer upon layer: thermoregulation in schizophrenia. *Schizophr Res.* 2004;69(2-3):149-57.
2. Viron MJ, Stern TA. The Impact of Serious Mental Illness on Health and Healthcare. *Psychosomatics.* 2010;51(6):458-65.
3. Cuddy MLS. The Effects of Drugs on Thermoregulation. *AACN Advanced Critical Care.* 2004;15(2):238-53.
4. Eyer F, Zilker T. Bench-to-bedside review: Mechanisms and management of hyperthermia due to toxicity. *Critical Care.* 2007;11(6):236.
5. Reilly TH, Kirk MA. Atypical Antipsychotics and Newer Antidepressants. *Emergency medicine clinics of North America.* 2007;25(2):477-97.