Heat-Related Mortality in BC: Surprising Numbers

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Semiahmoo
2010
Heat wave, Chicago, 1995: refrigerator trucks outside city morgue
So, does summertime Heat cause excess mortality in BC?

At first glance:
1. Deaths increase during winter months
2. Hyperthermia, and other deaths *directly* related to heat (ICD-9 992) are a *rare* cause of death in BC.
3. BC is not like back East. In summer, the temperature rises gradually. It cools off at night. We don’t have prolonged hot spells.
If heat is not a BC problem…

.........What about last summer?
Impact of the late July heat episode on Vancouver and the lower Fraser Valley among persons <65
Impact of the late July heat episode on Vancouver and the lower Fraser Valley among persons 65+
Ongoing research

• Case-only assessment of summer 2009 heat (events) for the interaction of gender, age, geography, cause, and place of death on risk of dying on a hot versus a typical summer day.
What about “typical summers?”
Time series (semi-ecological) methods to assess the (general) relationship between weather and daily mortality
Time series (semi-ecological) methods to assess the relationship between weather and daily mortality: select BC regions
Daily Deaths (all ages, all cause)
Vancouver North Metropolitan Area (LHAs: 38, 44, 45, 161-166)
Associated with Temperature at Vancouver Airport, 1986-2008
Daily Deaths (all ages, all cause)
Fraser Health Authority
Associated with Temperature at Abbotsford Airport, 1986-2008
Daily Deaths (all ages, all cause) for Victoria and Region (LHAs: 61, 63, 64, 65) Associated with Temperature at Victoria Airport, 1986-2008
Daily Deaths (all ages, all cause) for Kamloops Region (LHAs: 24, 30, 31) Associated with Temperature at Kamloops Airport, 1986-2008
Daily Deaths (all ages, all cause) for Prince George (LHA: 57) Associated with Temperature at Prince George Airport, 1986-2008
<table>
<thead>
<tr>
<th>Region</th>
<th>LHA</th>
<th>Mean temperature (June to Sept 15th)</th>
<th>90th percentile annual temperature threshold</th>
<th>% change in mortality per degree increase in temperature over threshold</th>
<th>Lower 95% CI</th>
<th>Upper 95% CI</th>
<th>Percent attributable fraction</th>
<th>Above threshold attributable deaths / year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancouver North Metropolitan Area</td>
<td>38, 44, 45, 161-168</td>
<td>17.09</td>
<td>18.00</td>
<td>3.75</td>
<td>2.53</td>
<td>4.99</td>
<td>0.51</td>
<td>31.74</td>
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<tr>
<td>Sunshine Coast</td>
<td>46, 47, 48</td>
<td>17.09</td>
<td>18.00</td>
<td>5.33</td>
<td>1.16</td>
<td>9.68</td>
<td>0.72</td>
<td>3.45</td>
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<tr>
<td>Fraser Health Authority</td>
<td>32-35, 37, 40-43, 75-76, 201-202</td>
<td>17.30</td>
<td>18.40</td>
<td>2.45</td>
<td>1.67</td>
<td>3.24</td>
<td>0.43</td>
<td>33.37</td>
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<tr>
<td>Kamloops</td>
<td>24, 30, 31</td>
<td>19.86</td>
<td>21.45</td>
<td>1.07</td>
<td>-1.02</td>
<td>3.21</td>
<td>0.24</td>
<td>1.91</td>
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<tr>
<td>Okanagan</td>
<td>14-17, 21-23, 77-78</td>
<td>18.79</td>
<td>20.50</td>
<td>1.10</td>
<td>-0.20</td>
<td>2.43</td>
<td>0.22</td>
<td>5.59</td>
</tr>
<tr>
<td>Victoria and region</td>
<td>61, 63, 64, 65</td>
<td>16.07</td>
<td>16.90</td>
<td>2.90</td>
<td>1.48</td>
<td>4.35</td>
<td>0.42</td>
<td>13.36</td>
</tr>
<tr>
<td>Prince George</td>
<td>57</td>
<td>14.40</td>
<td>15.80</td>
<td>1.40</td>
<td>-1.50</td>
<td>4.37</td>
<td>0.27</td>
<td>1.23</td>
</tr>
</tbody>
</table>
Ongoing research

• Meta-analysis of the influence of climate, geography and demography on the threshold for heat-related mortality and on post-threshold slope for BC’s 50 largest local heath areas (95% of provincial population).
Elements of a public health response
Levels of heat-health prevention

- Rapid treatment
- Hot day messaging / protective responses
- Identification of susceptibilities / pre-hot days adaptation
- Increase personal and social resilience
- Urban adaptation
- Greenhouse gas reduction
Hot day messaging: essentials

- Find a cool space
- Drink extra water
- Avoid strenuous activity
- If you feel “off”, cool off, and hydrate
- Heat affects health quickly: look in on others; have others look in on you

It’s summer. Be cool!

Wear lightweight clothing and a hat!

Drink a lot of water even before you feel thirsty.

Use an air conditioner to cool your home!
Increasing resiliency: *among programs adopted elsewhere*

- Fan provision programs
- Prohibition of power cuts
- Opening pools and water parks
- Buddy systems: community mobilization
- Cooling shelters
- Day care and eldercare facility licenses require cooling rooms
- Adding extreme heat to municipal response plans
Towards cooler cities
Thanks to my colleagues: Sue Pollock, Vanita Sahni, Terry Spock: EHSD, BCCDC Shakoor Hajat: LSHTM Giselle Bramwell: Environment Canada