BC Centre for Disease Control
An agency of the Provincial Health Services Authority

National Collaborating Centre for Environmental Health

Centre de collaboration nationale en santé environnementale

Evaluating the cost-effectiveness of heat early warning systems

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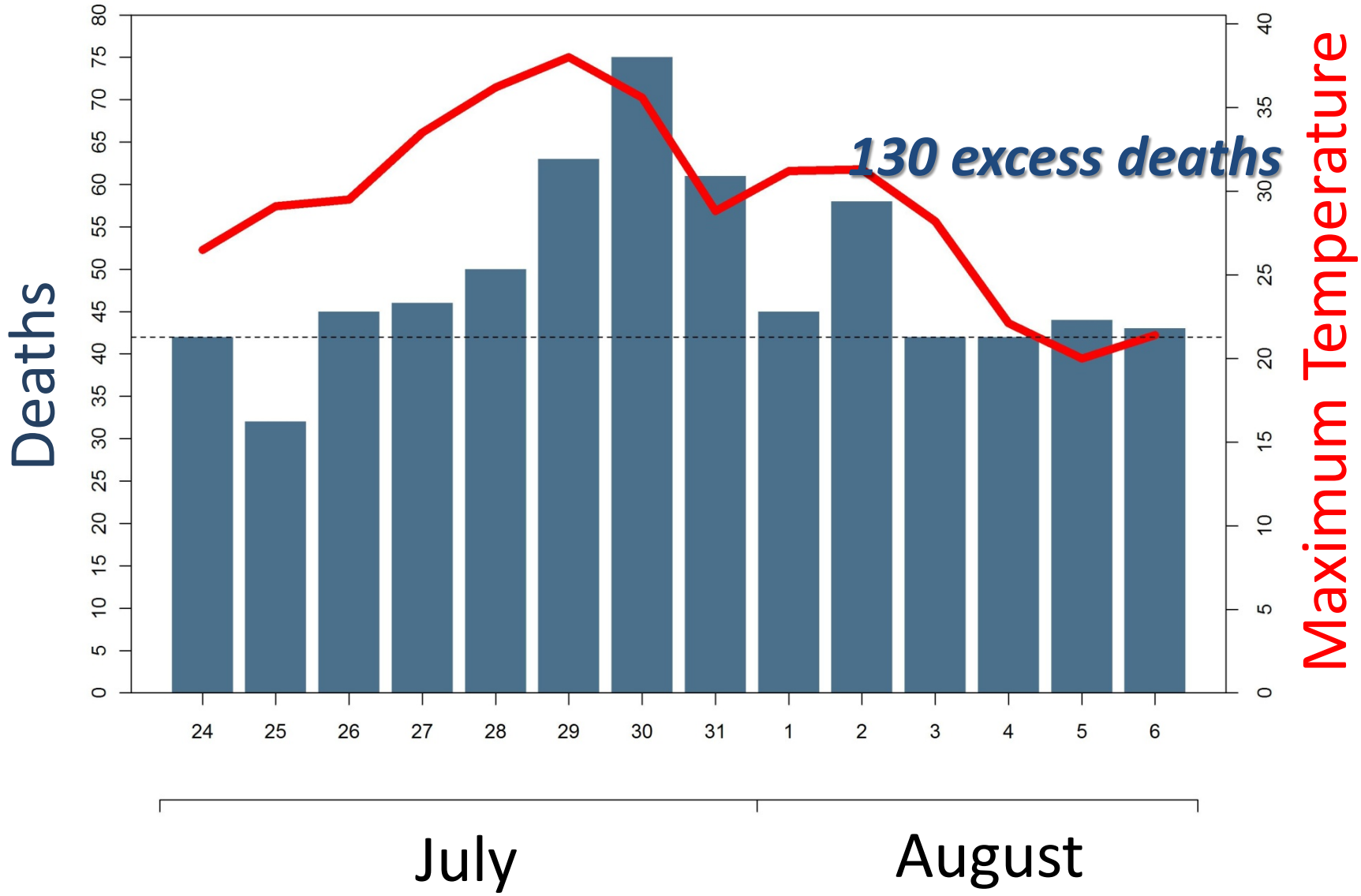
Metro Vancouver Summer 2009



Excessive Heat Watch

An Excessive Heat Watch is issued when there is a potential for the heat index value to reach or exceed 110 degrees (east of the Blue Ridge) or 105 degrees (west of the Blue Ridge) within the next 24 to 48 hours.

Excessive Heat Warning

An Excessive Heat Warning is issued when the heat index value is expected to reach or exceed 110 degrees (east of the Blue Ridge) or 105 degrees (west of the Blue Ridge) within the next 12 to 24 hours. An Excessive Heat Warning may be issued for lower criteria if it is early in the season or during a multi-day heat wave.

Heat Advisory

A Heat Advisory is issued when the heat index value is expected to reach 105 to 109 degrees (east of the Blue Ridge) or 100 to 104 degrees (west of the Blue Ridge) within the next 12 to 24 hours. A Heat Advisory may be issued for lower criteria if it is early in the season or during a multi-day heat wave.

NATIONAL WEATHER SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

Necessary but not sufficient

cost-effectiveness of heat early warning systems

effectiveness measure

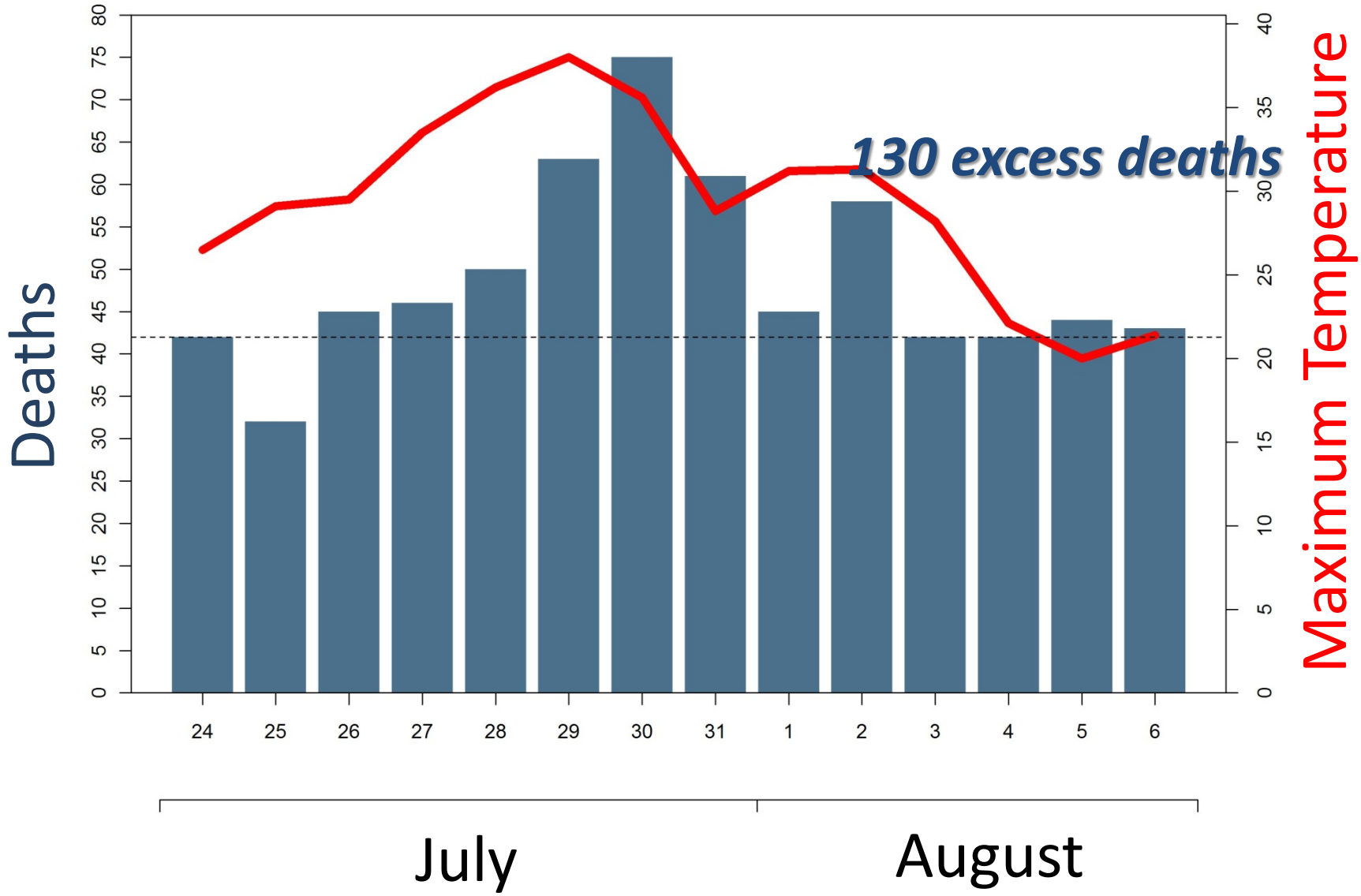
- Measurably better prediction of above-threshold temperatures (lethal conditions) 1, 2, 3…x days forward
- Mobilization to limit hyperthermia death; any death; not otherwise expected death; hospitalization; consequential morbidity; productivity loss; given trigger to action
- Measure of effect (direct and indirect) and how determined; eg. 50% reduction in all above threshold day deaths based on vital stats
- *Spillovers in averted deaths beyond warning days*

cost-associated with achieving

- Required improvement in hot weather prediction
- Weather network---health---community connectedness; cooling shelters; community mobilization efforts; health care facility readiness, etc.
- Both of the above
- *Cost of false alarms (social, economic)*

Unexpected !

Metro Vancouver Summer 2009



Effectiveness Goal: to prevent half of all "hot-spell" deaths as economically as possible

Options

1. Early warning system…..several sub-options for warning and outreach
2. Develop critical infrastructure: fan distribution, cooling rooms, cooling shelters….etc
3. Environmental buffers—greening, blueing, increased albedo

Which combination would most economically avert 65 deaths during a repeat of the 2009 Vancouver hot spell

Costs and benefits of early warning systems *Rogers and Tsirkunov, 2010*

*three specific spending items desirable for disaster prevention---early warning systems, critical infrastructure, environmental buffers

*cost-benefit analysis says that an investment whose benefits exceed the costs should be undertaken, and if there are competing proposals, the one with the highest benefit to costs should be prioritized

*consider the overall operational cost of the system, the social and economic cost due to false alarms and the societal and economic savings due to timely action

*When spending on preventive measures does occur, it is often biased against those with little economic clout: early warning systems rather than protective measures may serve the poor better

cost-benefit ratio of heat early warning systems

benefit measures **Σ** **costs-associated with producing**

- **Fewer (50%) hot-day deaths---$ value**
- **Fewer hot day hospitalisations---$ value**
- **Productivity gain---$ value**
- **Intangible well-being---$ value**
- ***Spillovers in averted deaths beyond warning days---$ value***

- **Required improvement in hot weather prediction**
- **Weather network---health---community connectedness; cooling shelters; water distribution; fan handouts; utility bill deferrals; community watch efforts, etc.**
- ***Cost of false alarms (direct, indirect)***

Costs and benefits of early warning systems *Rogers and Tsirkunov, 2010*

"the costs of a warning system itself may be high relative to the benefit if that system is used solely for infrequent events---think extreme heat in regions where that rarely occurs---"if the cost of an ongoing warning system (*and response readiness*) is high relative to the potential savings, the cost may exceed the expected losses due to the infrequent event---in that case resources could be better spent elsewhere"

Thanks

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