Climate change and extreme weather events: Preparedness for climate disasters

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Climate Adaptation Futures

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Risks, roles & obligations

Neil Adger

... “social contract” between citizens & state
- Functionality tested during calamitous events
Risks, roles & obligations

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- Climate change . . . . extreme heat events
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- Adaptation . . . . What role for the state??
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- Functionality tested during calamitous events
- Climate change ..... extreme heat events
- Adaptation ..... What role for the state??
- Prepare systems
- Promote resilience & protect the high risk
Public Health Preparedness

- **Scientific knowledge**
  - Relevant evidence
  - Understanding of local significance
  - Understanding of human response & resilience

- **Educated workforce**
  - Policy makers . . . practitioners

- **Educated public**

- **Systems**
  - Capacity to function and cope with surge demand
  - Networked with rest of societal response
  - Communications
  - Flexibility to function in absence of supports

- **Evaluations, learning, assimilating improvements**
Projections of extreme events

- Warmer and fewer cold days and nights, warmer and more frequent hot days and nights (Virtually certain)
- Increase in frequency of hot extremes, heat waves, and heavy precipitation. (Very likely)
- Increase in tropical cyclone intensity, drought affected area. (Likely)

Source: IPCC
Heat – limited human tolerances

- Core temp small tolerance range ≈ 37°C
  - ↑T° ⇒ dehydration, cognition↓, muscle fatigue,
    ⇒ ⇒ Acute Renal Failure, Cardiovascular events
  - .... 40 - 42°C ⇒ death

- 6 factors influence human thermal balance:
  - air temperature, humidity, air movement (wind speed), radiated heat, clothing, ability to sweat and level of physical activity
  - If humid & T° > 33° ⇒ ↑↑↑ risk of overheating unless external intervention . . . eg air conditioning
Motivators to risk health

Lack of choice:

- Powerless ... poor, paid by output, military
- Obligated . . . . Carers
- Emergency & essential service workers
Providing emergency services in disasters

“Morning tea followed and later a BBQ was served. Corps members enjoyed the chance to chat during the meal despite the extreme heat of the day.”
RDNS nurses on home visits during extreme heat have found:

- An older man with his air-conditioner on, but accidentally switched to 'heat'
- Older women wearing cardigans or jumpers
- Food left out in the kitchen which needs refrigeration
- People with dementia not eating or drinking.

“Our nurses and RDNS health care and domestic workers will be extra vigilant this week to recognise any signs of heat and post-heat stress,” Dr Kralik said. “Heat may worsen the condition of someone who already has a medical condition such as heart disease.”

Nurses and carers & others . . . “Essential services”

- Workload increases during extreme heat events
- More difficult circumstances
- Travelling in cars
Effect of WBGT on work output

Tord Kjellstrom, et al 2009
<table>
<thead>
<tr>
<th>WGBT °C</th>
<th>Flag Colour</th>
<th>Guidance for non-acclimatized personnel in boldface</th>
<th>Guidance for fully acclimatized personnel in italics</th>
</tr>
</thead>
<tbody>
<tr>
<td>25°C–26.9°C</td>
<td>No flag</td>
<td>Extreme exertion may precipitate heat illness</td>
<td>Normal activity</td>
</tr>
<tr>
<td>27°C–28.9°C</td>
<td>Green</td>
<td>Use discretion in planning intense physical activity</td>
<td>Normal activity</td>
</tr>
<tr>
<td>29°C–30.9°C</td>
<td>Yellow</td>
<td>Cancel intense physical activity; curtail other outside work</td>
<td>Use discretion in planning intense physical activity</td>
</tr>
<tr>
<td>31°C–31.9°C</td>
<td>Red</td>
<td>Stop work details and physical conditioning</td>
<td>Curtail strenuous exertion, limit outdoor work to 6 hours</td>
</tr>
<tr>
<td>= &gt; 32°C</td>
<td>Black</td>
<td>Cancel all outdoor work requiring physical exertion</td>
<td>Cancel all outdoor work involving physical exertion</td>
</tr>
</tbody>
</table>

Source: US Military
Securing protective services - workforce capacity in extreme heat

Current situation
- Service preparedness highly variable
- Efficacy of preparedness planning also

Future scenarios – beyond known extremes
- Potential repeat of 2009, longer, hotter, complex

Preparedness for worse case heat
- OH&S considerations
  - Cooling, fluids, rest breaks each hour, staffing,
- Intersectoral operations – supports
- Expand guidelines to entire workforce
- Public health education – to minimize demands
Thank You

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