



Excessive heat exposure

what is it and how does it manifest in the Caribbean?

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Excessive Heat in the Caribbean

Heat stress ?

HEATWAVES: USA





HEATWAVES: RUSSIA 2010



Land Surface Temperature Anomaly (°C)

12

Average daily maximum temperature in Moscow for early August is 21°C; during the first half of August 2010, temperatures were 15°C above average.

-12

Estimates placed the death toll near 55,000 people across Russia.



Credit: Peter Berry – Health Canada

HEATWAVES: INDIA 2010



Azhar et al (2014), PLoS ONE 9(3)



HEATWAVES: HUMAN IMPACTS



Alerting can also be done for discomfort and increased morbidity Alerting can be done for livestock mortality

Gasparrini et al, Lancet 2015



Excessive Heat in the Caribbean

What is our concern?

- Heat stress induced by excessive heat exposure
- Contributing factors:
 temperature, humidity, wind & sunshine
- Heat Index

 measure of
 feel-like
 temperature.
 Takes into
 account temp.
 humidity.

Heat Index in Zanderij, Suriname

Percentage of time within certain heat index ranges



Global Warming: The Caribbean

>15% increase in frequency of warm days >15% increase in frequency of warm days 1°C warming of hottest days and nights 7% decrease in frequency of cold days 10% decrease in frequency of cold nights 1°C warming of coldest days and nights

HEATWAVES: THE CARIBBEAN

We are unable to quantify the impacts of heatwaves in the Caribbean. **BUT** we do know that we should be concerned about heatwaves because:

- Heatwaves have a major impact on most other parts of the globe
- Heatwaves have a stronger impact than any other meteorological hazard in many places
- Heatwaves have a bigger impact than most people realise
- Dangerous levels of heat do occur in the Caribbean
- Hot days and nights are becoming more frequent in the Caribbean
- Because of global warming, hot days and nights will become even more frequent in the Caribbean

HEATWAVES: SECTORIAL IMPACTS

- Human health: morbidity and mortality
- Economic: reduced labour productivity
- Energy: cooling demand
- Infrastructure: road and rail conditions
- Agriculture: crop and livestock survival and growth rates

Which are most relevant in the Caribbean?

Heat stress:

- Maximum temperature
- Minimum temperature
- Humidity
- Wind
- Solar radiation

HEATWAVES: MEASUREMENT

Mortality in the South-Eastern USA correlates best with a definition of **heat wave** as being: a period of at least 2 consecutive days with maximum temperatures above the 95th percentile.

Until a regional study is made in the Caribbean, this serves as our best (but insufficient) proxy.

However, because of poor spatial coherency and predictability the definition is modified to: a period of at least 2 consecutive days with maximum temperatures above the 90th percentile.

HEATWAVES IN THE CARIBBEAN

HEATWAVES: SEASONALITY

