



Heat health

Dr Kristen Pearson

March 2024



Acknowledgement of Country



Extreme heat



Kills more Australians than any other climate disaster



Planet is getting hotter

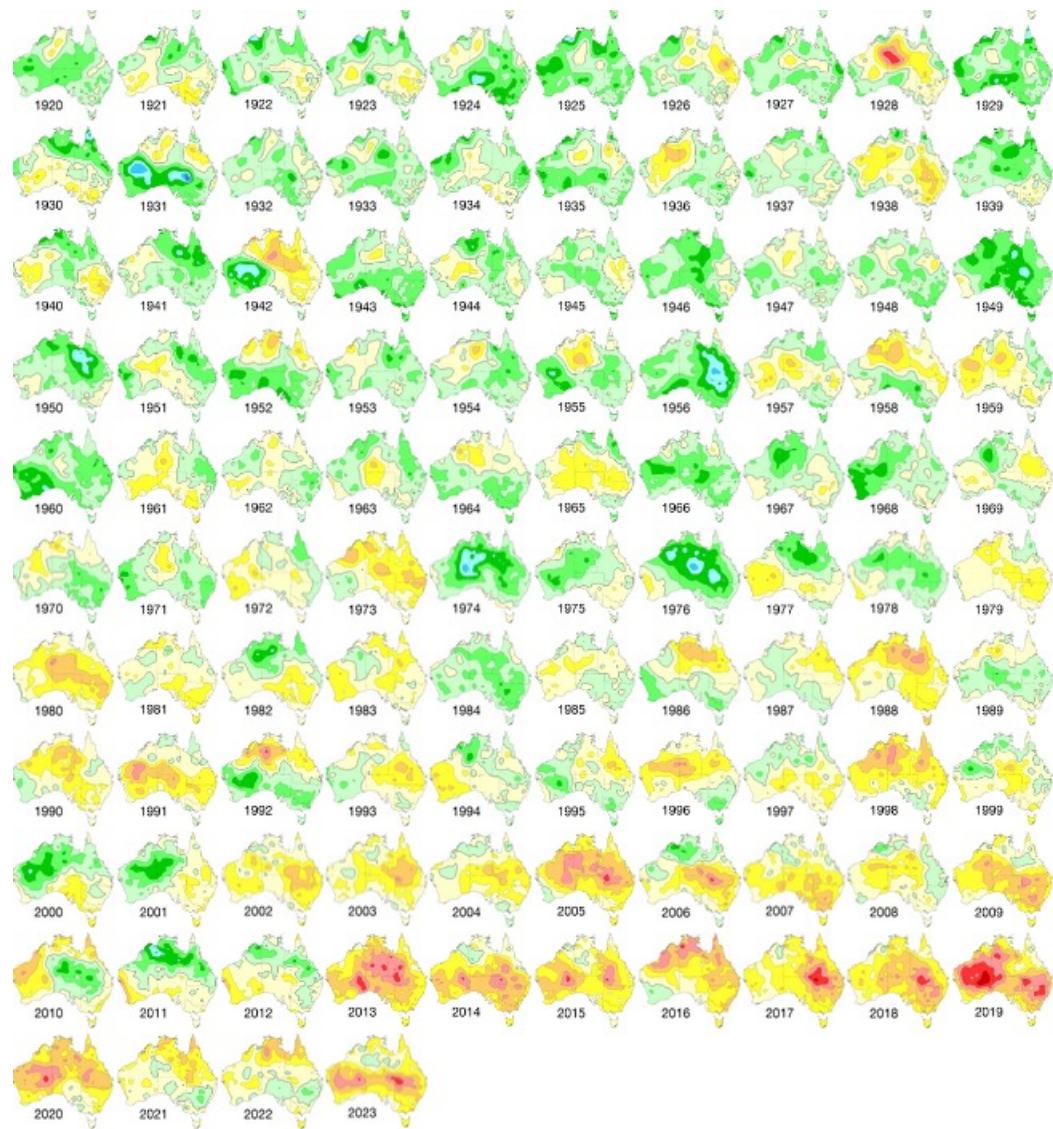


Fossil fuel pollution worsens global heating

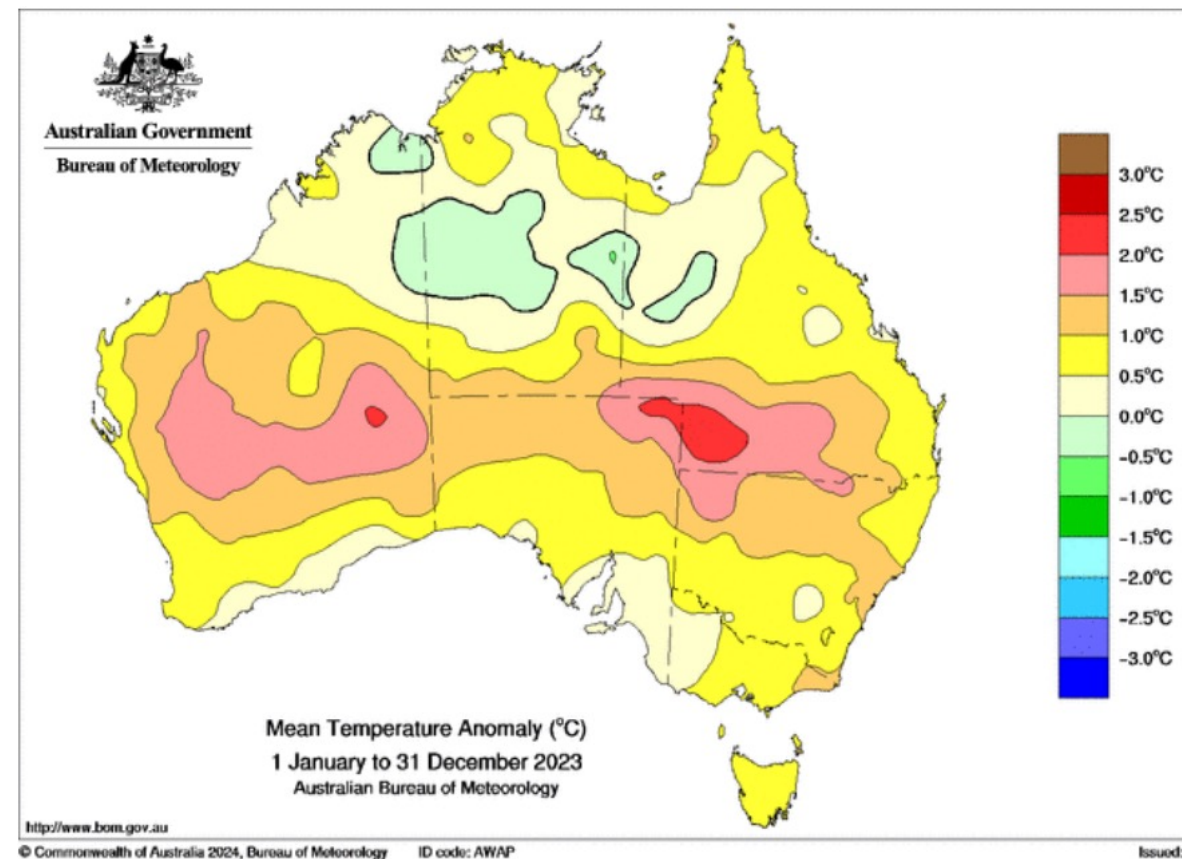


If we do nothing - heatwaves will get hotter, happen more often, last longer

We must act on global heating



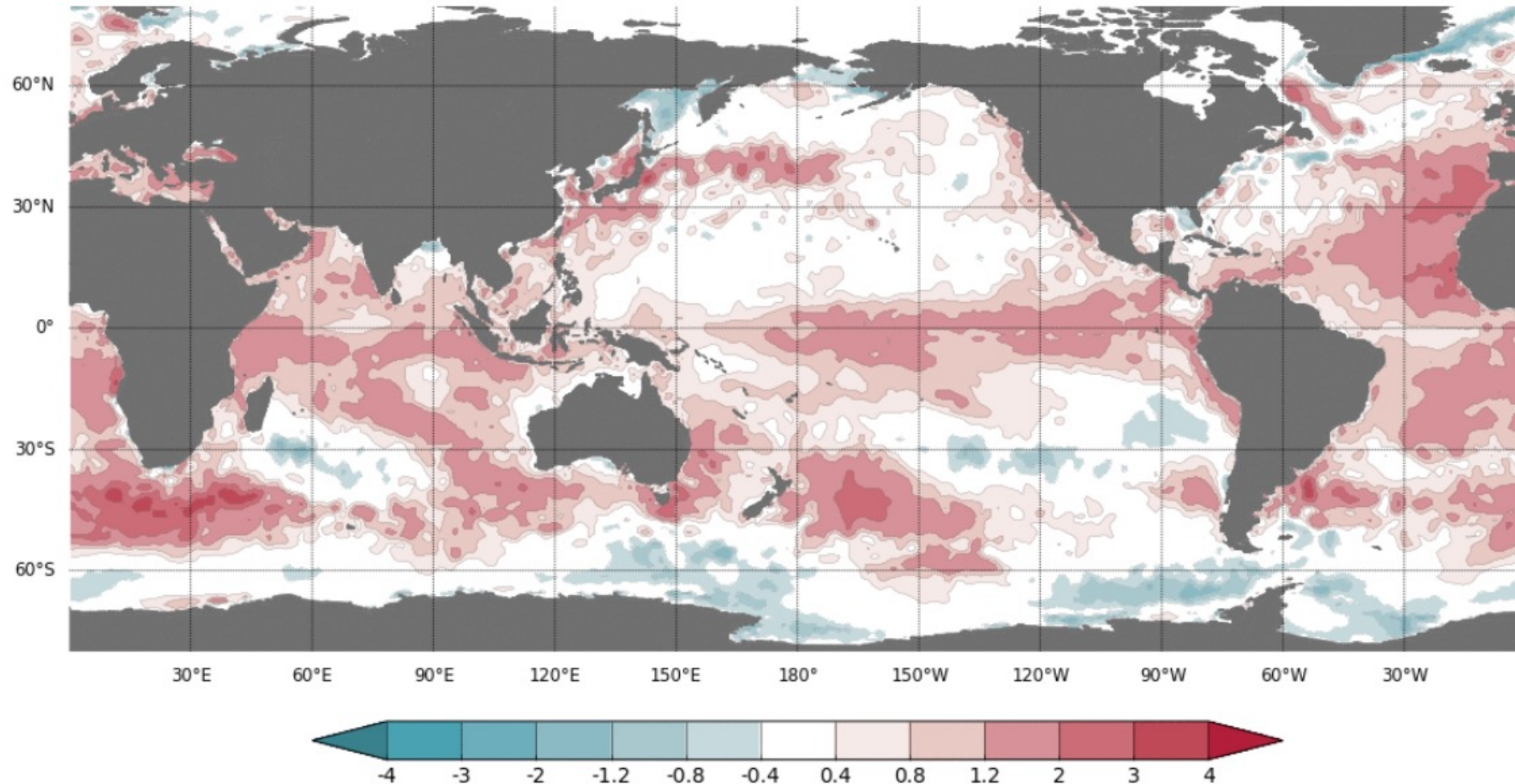
Bureau of Meteorology



<http://www.bom.gov.au/climate/maps/>

February 2024 Sea surface temperature Anomalies

Bureau of Meteorology



Data: BOM SST
Climatology baseline: 1961 to 1990
© Commonwealth of Australia 2024, Australian Bureau of Meteorology

Monthly average: February 2024
Created: 04/03/2024
<http://www.bom.gov.au/climate>



Australian Government
Australian Research Council



climate extremes
ARC centre of excellence

The State of Weather and Climate Extremes 2023

1

Globally,
2023 was the warmest
year in recorded history.

2

Australia experienced a
broad range of record-
breaking extremes.

3

Impacts from
extreme events had
economy-wide effects.



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Legend



Hail



Extreme
wind



Cyclone



Snow
depth



Extreme heat/
Heatwaves



Fires



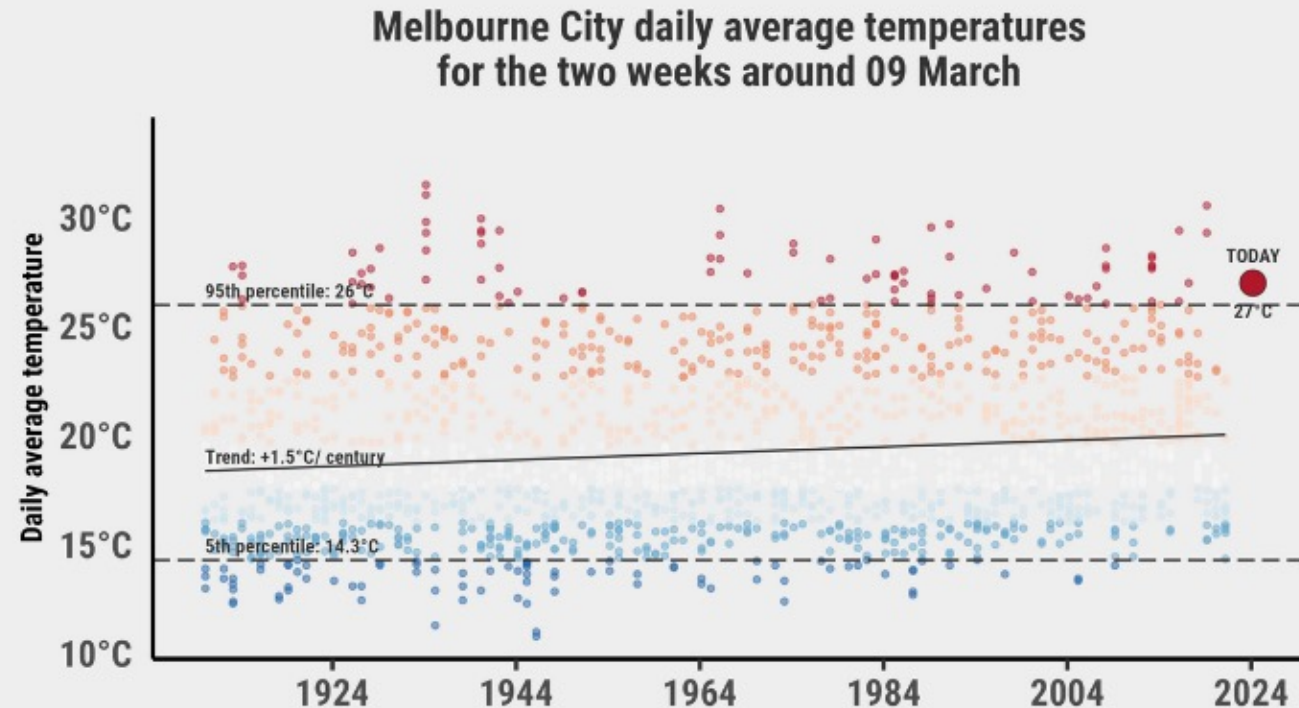
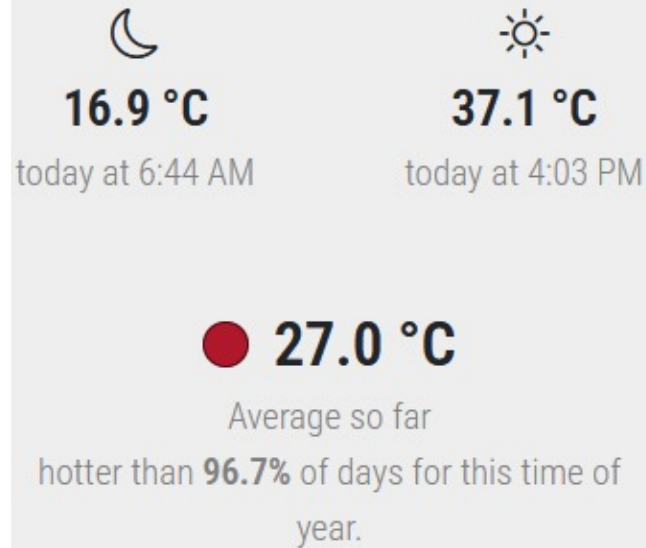
Extreme rain



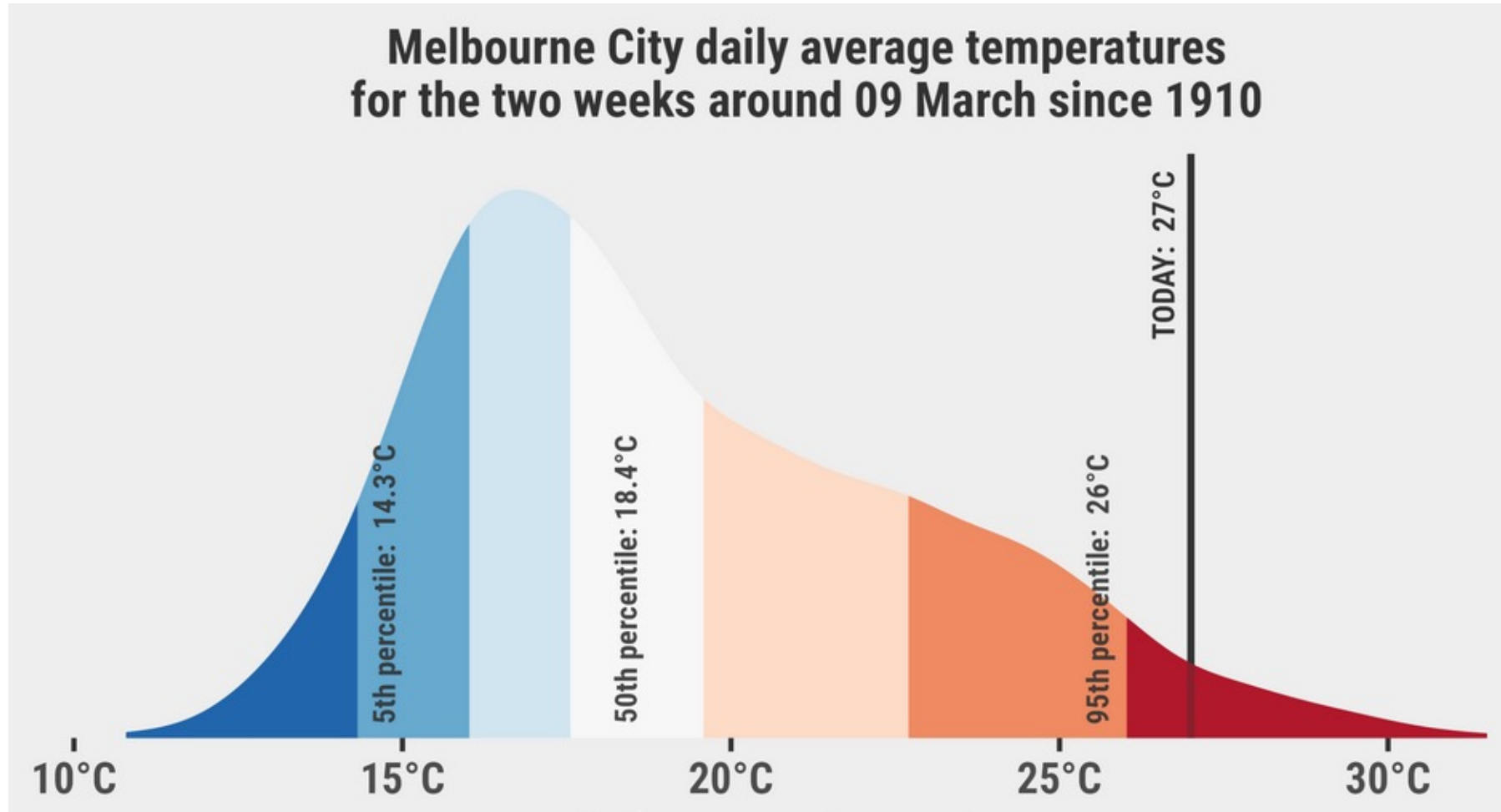
Flood

www.isithotrightnow.com

Here's how today compares...



www.isithotrightnow.com



Heat wave definition



A heat wave is:

- The maximum AND minimum temperatures are unusually hot over 3 days.
- compared to the local climate and past weather.

This can lead to:

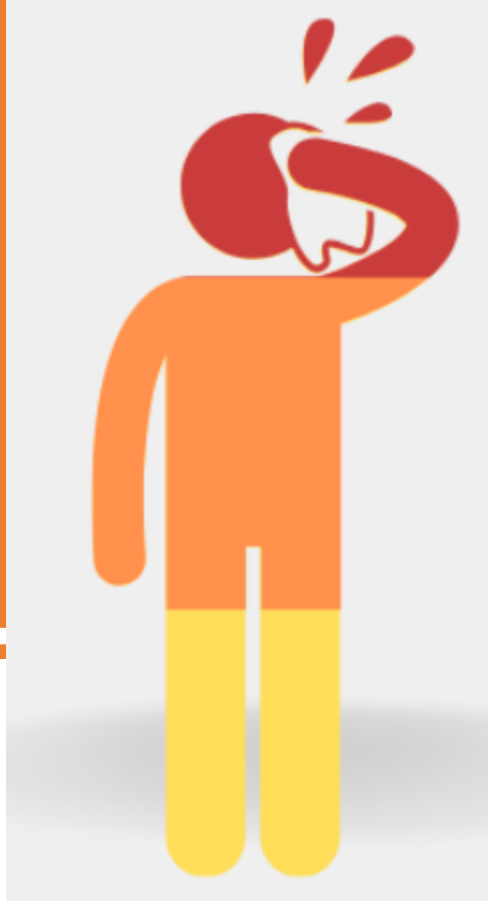
- heat stress, a critical factor in human health
- Affects on infrastructure such as public transport & electricity supply.

Heat wave intensity



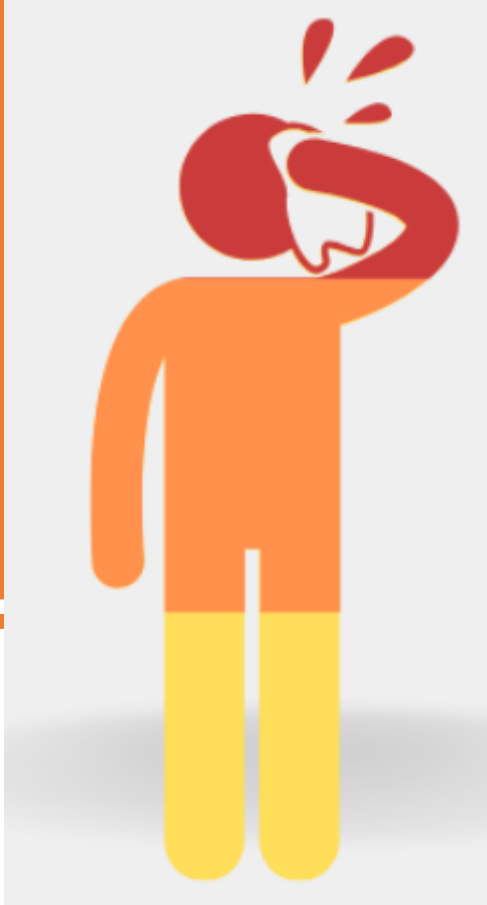
Intensity is measured using Excess Heat Factor (EHF)

- **Low-intensity heatwaves** are frequent during summer. Most people can cope
- **Severe heatwaves** are less frequent. More challenging for vulnerable people.
- **Extreme heatwaves** are rare. They are a problem for people who don't take precautions to keep cool – even for healthy people. Anyone who works or exercises outdoors can be at risk.



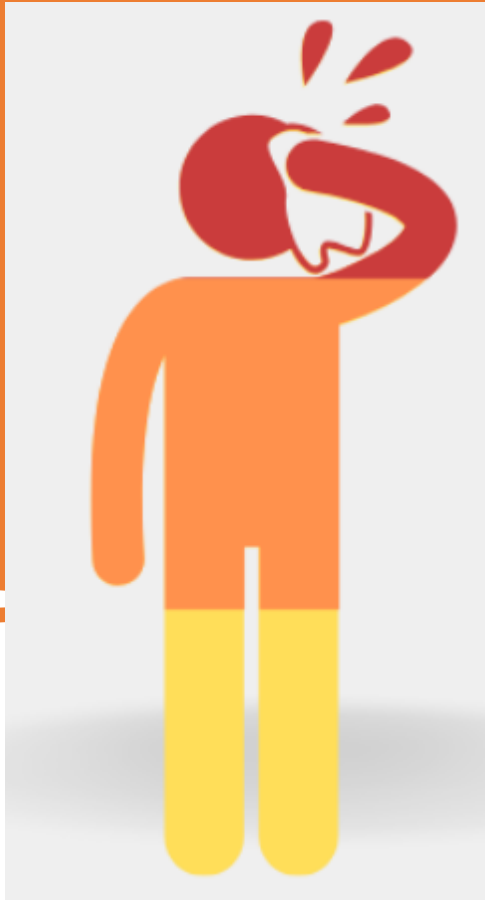
Heat Stress

- feeling uncomfortable from heat
- weakness
- tiredness
- cramps
- dizziness



Heat Exhaustion

- high internal body temperature($>38^{\circ}\text{C}$)
- reduced amount of sweating because of insufficient fluid in the body
- nausea
- vomiting
- headache
- fainting



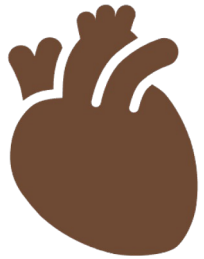
Heat Stroke

- very high internal body temperature ($>40.5^{\circ}\text{C}$)
- confusion
- reduced alertness
- red, hot dry skin

Heat Stroke
can quickly become
life-threatening

Other health effects

- Worsen chronic disease
- Heart attacks and strokes
- Aggravate lung disease – increased asthma & emphysema attacks
- Kidney disease – dehydration, poor blood flow
- Kidney stones
- Increased risk of poor pregnancy outcomes: premature birth, low birth weight, stillbirth



Other health effects



Mental health

- People feel lethargic or irritable
- Reduced sleep quality
- Increased stress & anger
- Those with mental health or cognitive diseases more prone to effects of heat
- Suicide risk

Social dysfunction

- Domestic violence & assault
- Alcohol consumption

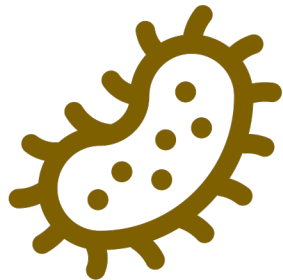
Other health effects

Skin diseases

- e.g. eczema, skin infections, prickly heat

Infectious diseases

- Waterborne and foodborne disease
- Urinary tract infections
- Mosquito breeding
 - dengue fever
 - Ross River fever
- Algae and bacteria blooms in sea or freshwater –
 - skin and eye irritation
 - nausea, vomiting
 - muscle weakness
 - severe illness



Other health effects



Health risks
continue for days
after weather
has cooled

What makes extreme heat even more dangerous?



High humidity



High night-time temperatures



High temperatures early in the season



Disruptions to essential services



Smog



Bushfires

Who is most at risk?



Demographics

- Young age
- Older age
- Pregnant or breastfeeding
- Homeless / poor housing
- Financially disadvantaged
- Socially isolated
- Unable to move around

Who is
most at
risk?



Medical

- Chronic medical conditions
- Fever, vomiting, diarrhoea
- Some medications

Occupation / activity

- Work outdoors
- Exercise strenuously

Austin Hospital Emergency Department study

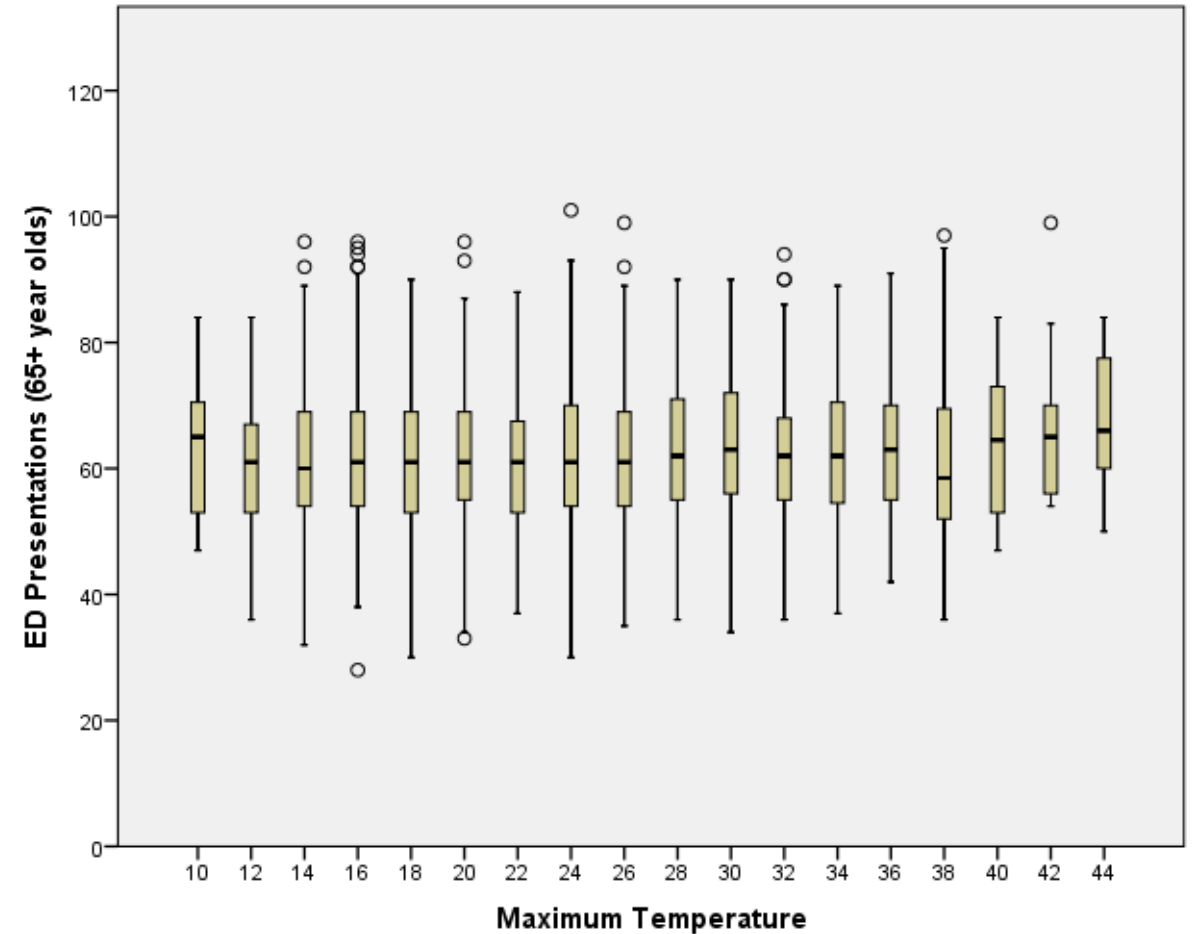
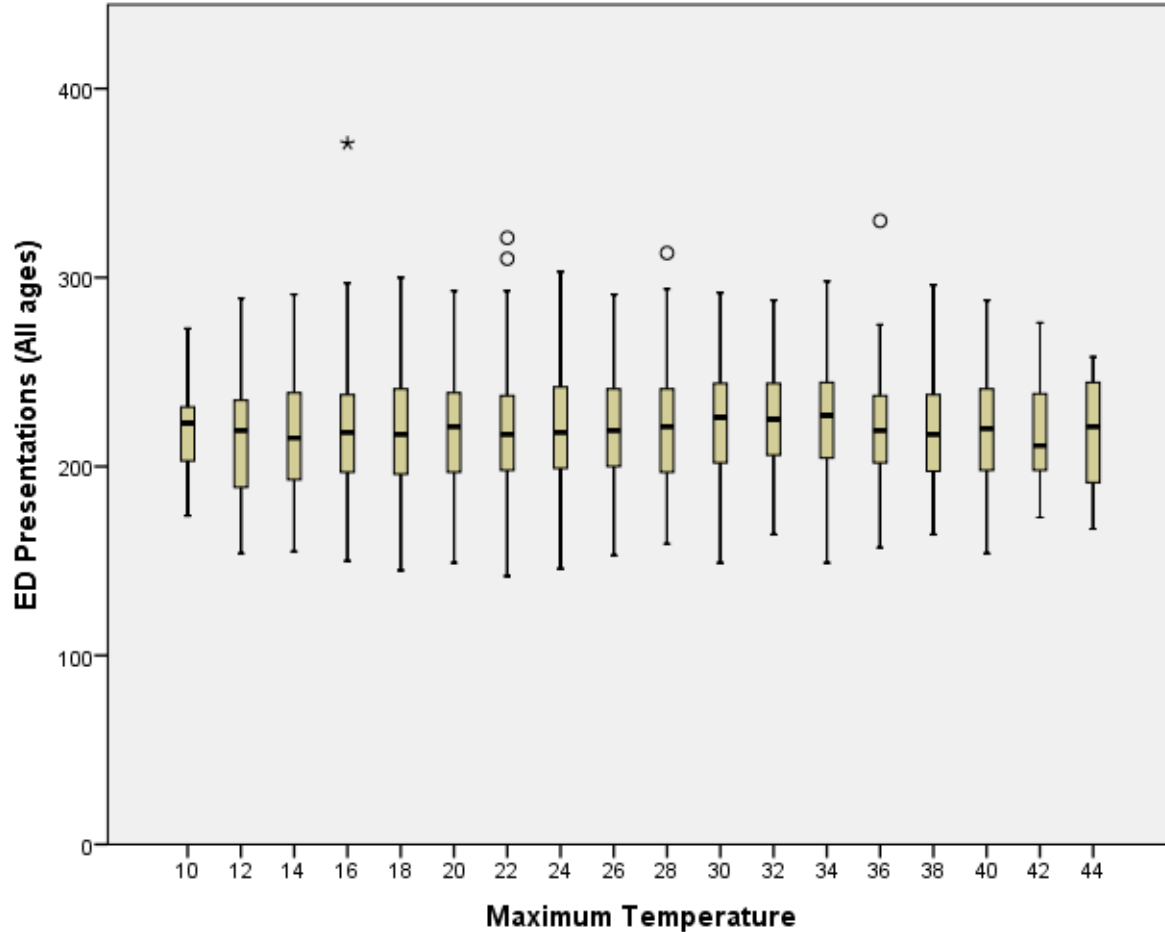
Dr Paul Yates, Dr Andrew Huynh, Mr Mark Zhong

Methods

- Daily temperature and hospital presentation data obtained
- Bureau of Meteorology for 1st Jan 2000 – 31st Dec 2019
 - Viewbank Weather Station, 1km from hospital
- Electronic medical records available for 1st Jan 2010 – 31st Dec 2019
 - Austin Emergency Dept presentations for individuals aged >65 years



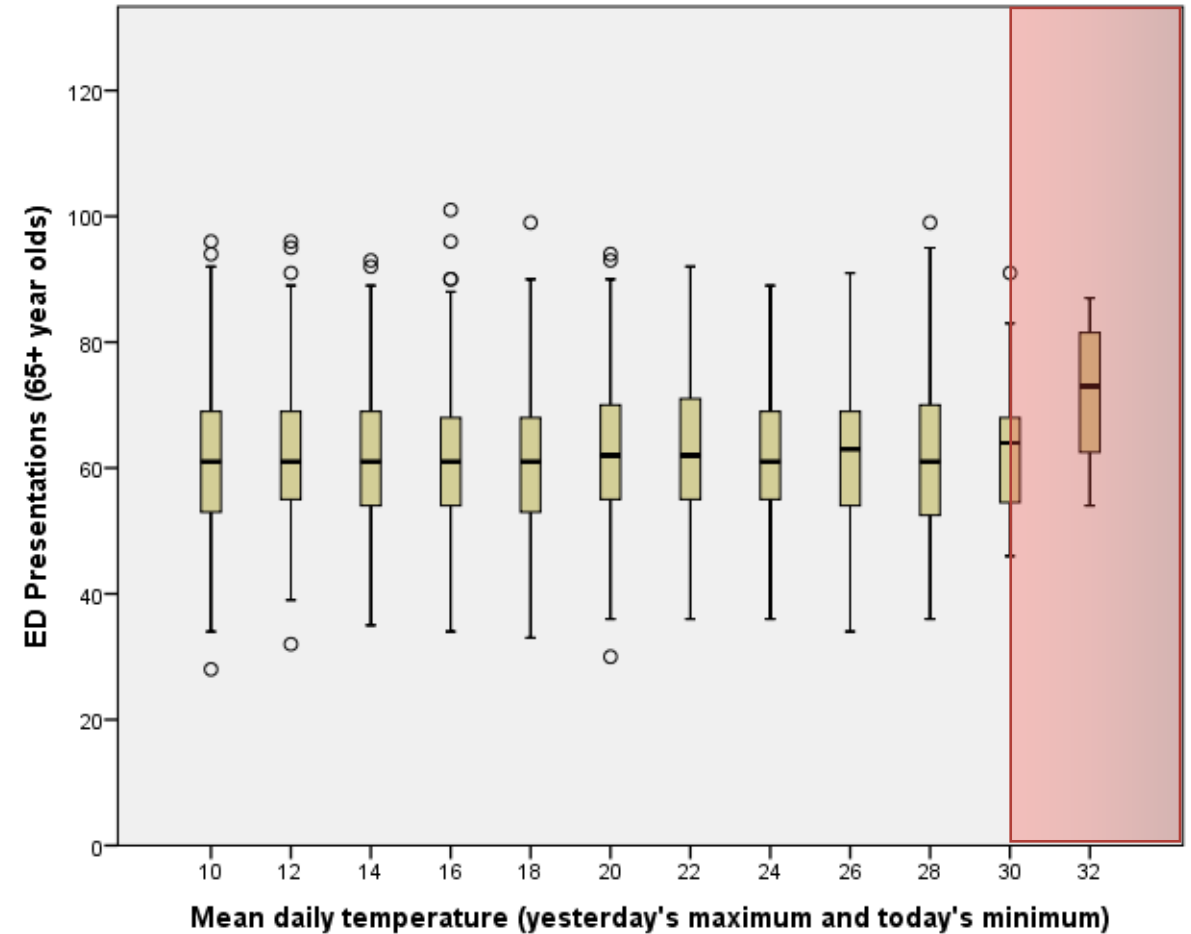
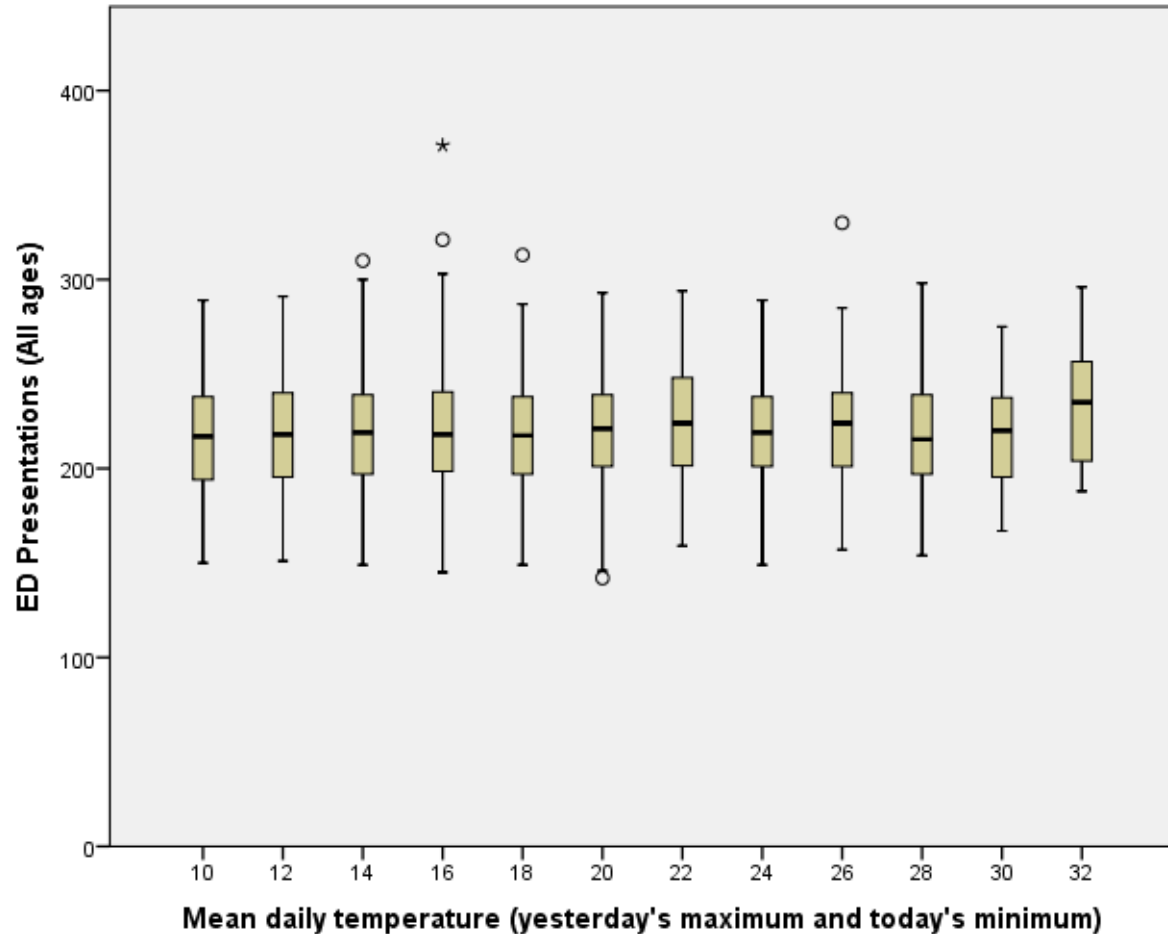
Results – elevated maximum temperature



- There was no significant association of elevated maximum temperature and ED presentations in all ages group or 65+ year old group



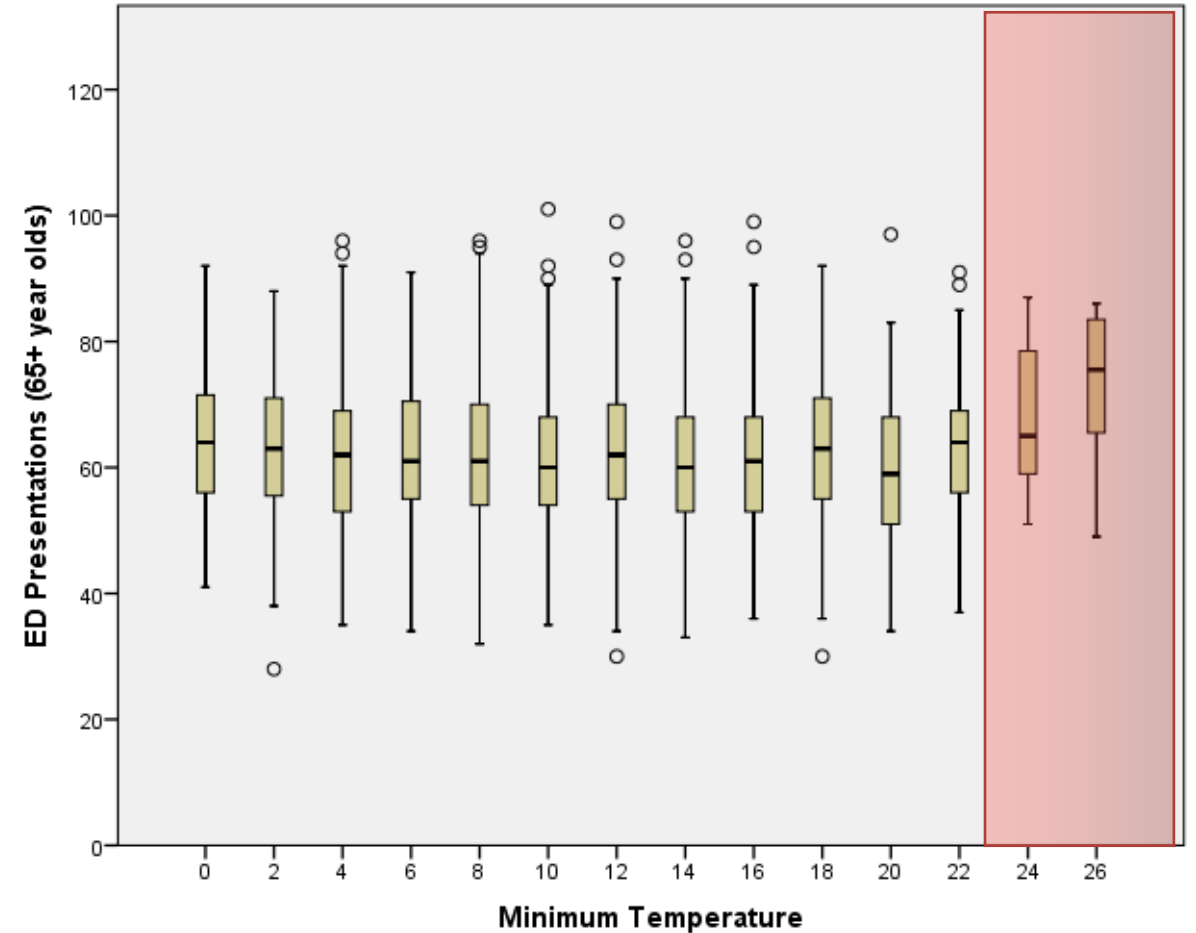
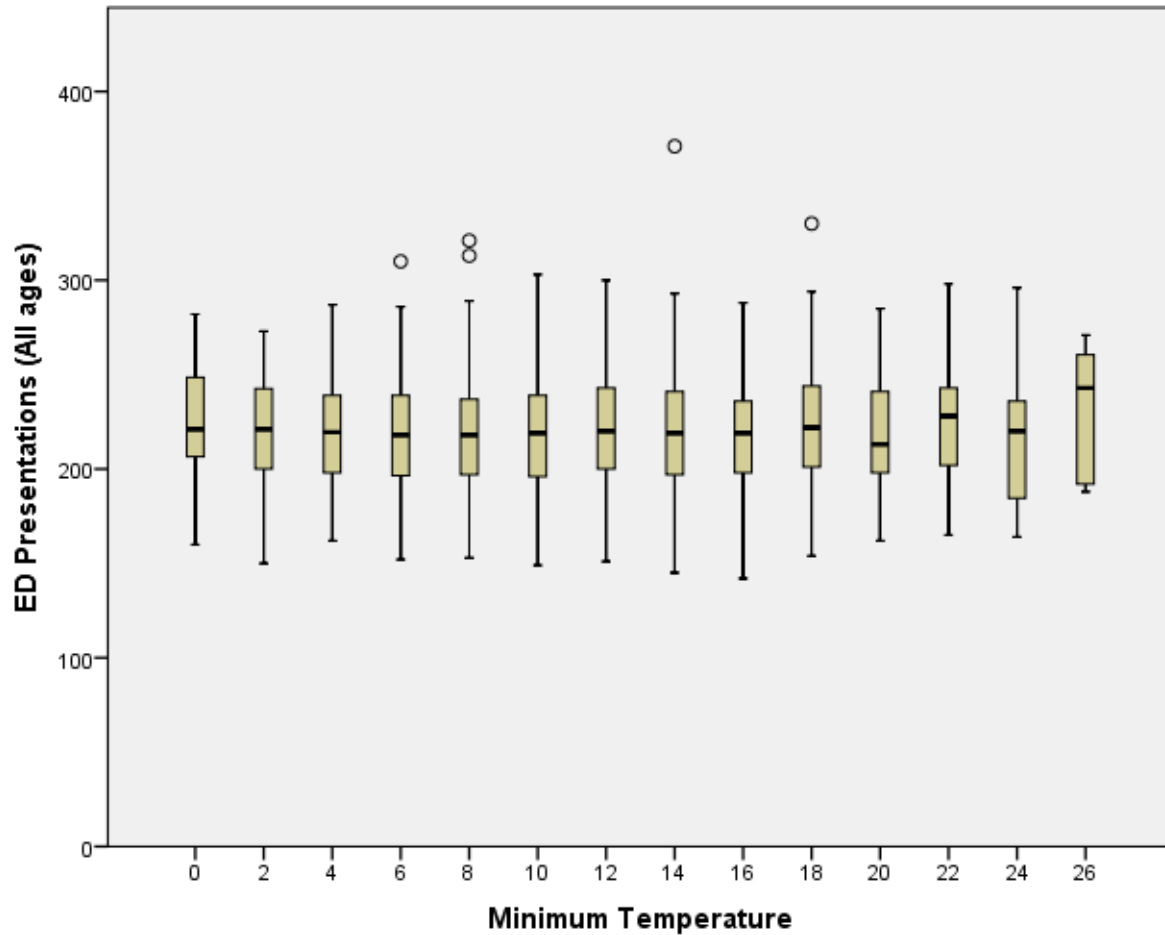
Results – elevated mean daily temperature



- Elevated mean daily temperature (>30°C) was associated with greater ED presentations for 65+ year olds (p=0.002)



Results – elevated minimum temperature



- Elevated minimum temperature (>22°C) was associated with greater ED presentations for 65+ year olds ($p < 0.001$)



Stay safe in
the heat:

Plan ahead



Plan ahead for hot weather, including power failures



Keep an eye on the forecast



Keep strenuous activity to cooler parts of the day



Stay informed of emergency warnings and advice



Medications – plan with your GP

Keep cool
and stay
hydrated



Drink plenty of fluids. Avoid alcohol.
Wear light, loose clothing.



Seek shade - may be cooler outside



Keep as much sun out as possible



Use electric fans to keep cool – but
don't use $>40^{\circ}\text{C}$



Set air conditioning to 27°C with extra
fan

Keep cool
and stay
hydrated



Use cool public areas like community centres & libraries



Cool showers, splash cold water or dampen your clothing



Do not leave anyone in parked cars — especially children and pets



Shade and water for pets too



Air buildings whenever it is cooler outside

Community level



BOM, Vic Emergency



Safe places



Department of Health
Vulnerable person register



ABC radio



Emergency response, Healthservices

SURVIVE THE HEAT

Heat kills more in Australia



DRINK WATER

Even if you don't feel thirsty, drink water. Take a bottle with you always.



PLAN AHEAD

Schedule activities in the cool part of the day and avoid exercising in the heat. If you must go out, wear a hat and take a bottle of water.

SURVIVE THE HEAT
Visit betterhealth.vic.gov.au

Authorised and published by the Victorian Government, 1 Treasury Place Melbourne

مقاومة حرارة

أكثر من أي كارثة طبيعية أخرى



إبقى بارداً

لحميت من الحرارة، ابقى البارد، استخدم مروحة، استخدم بقاء بارد وألبس ملابس خفيفة وحشوات مصنوعة من الأقمشة الطبيعية.



الآخرين

مناخنا في الحرارة - جارك الذي الليالي الأشخاص الذين يعانون من أمراض مزمنة أو كبار السن.

VICTORIA
State Government

For Cal or In
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TÔI BA PII PII PII

Ở Úc nắng nóng giết chết



UỐNG NƯỚC

Hãy uống nước kể cả khi quý vị không cảm thấy khát. Hãy luôn mang theo người một chai nước.



LẬP KẾ HOẠCH TRƯỚC

Lập kế hoạch thực hiện những thói quen mà tránh luyện tập khi nóng. Nếu phải đi ra ngoài, hãy chống nắng và mang theo nước.

TÓN TẠI DƯỚI NẮNG NÓNG
Truy cập betterhealth.vic.gov.au

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Lar ne betterhealth.vic.gov.au

Trong trường hợp khẩn cấp, gọi 000

Atuoc de piny e koc juic nok ne



ĐEKE PIU

Ye dek ne plu agut te keneyin cak yal. Ye gundun de plu muk ne nyindhi.



LOI AJUERDU I ATUOC NOOT

Ye ajur kekaj kedhiu tau ne thesk lire i ku dunce ye b pol ne thesk tul piny ke ngy ke rric leu be yin cak b aloic kay luom de nom ku tuc rat ne miokde gel ye gundun de plu muk ne nyindhi.

Na kor Chann lor ten Na noi

ARAB DCM

Duone mith, i yic teci pin dom ne arak pi



喝水

即使你不感到口渴，也要喝水。无论何时，都要随身携带水壶。



预先计划

将活动安排在一天内最凉爽的时间，避免在高温下锻炼。如果必须外出，应戴宽沿帽，防晒眼镜，并携带水壶。

抵御高温
访问 betterhealth.vic.gov.au

如需更多信息，请访问Better Health Channel。如果感到不适，应致电NURSE-ON-CALL (1300 60 60 24) 或去看医生。如遇紧急情况，应拨打000。

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抵禦高温

在澳大利亚，高温造成的死亡人数多过任何其它自然灾害。



车内高温会造成死亡

绝不要把孩子、老人或宠物留在车内。在停着的车内，温度会在几分钟内翻倍。



关注他人

照顾高温下风险最大的人们——独居的邻居、老年人、年轻人、疾病患者，此外别忘了你的宠物。



保持凉爽

待在有空调的建筑物里。拉好窗帘，开风扇，用凉水淋浴，穿天然面料的轻质宽松衣服。

Simplified Chinese

Look out for
others & know
what to do in
emergencies



- Stay in touch with family and friends, especially if they are at higher risk



- Learn first aid for heatstroke and heat exhaustion



- Phone '000' in a life-threatening emergency

Climate action – mitigation & adaptation



Cut greenhouse
gas pollution



Use renewable
energy instead



Protect the
natural world

Urban planning & design



Better insulation, ventilation and shading of buildings



More trees and greenery



Fewer hard surfaces



Improved public transport, including shading for waiting passengers



Improved shading of paths for walkers and cyclists

Climate resilience



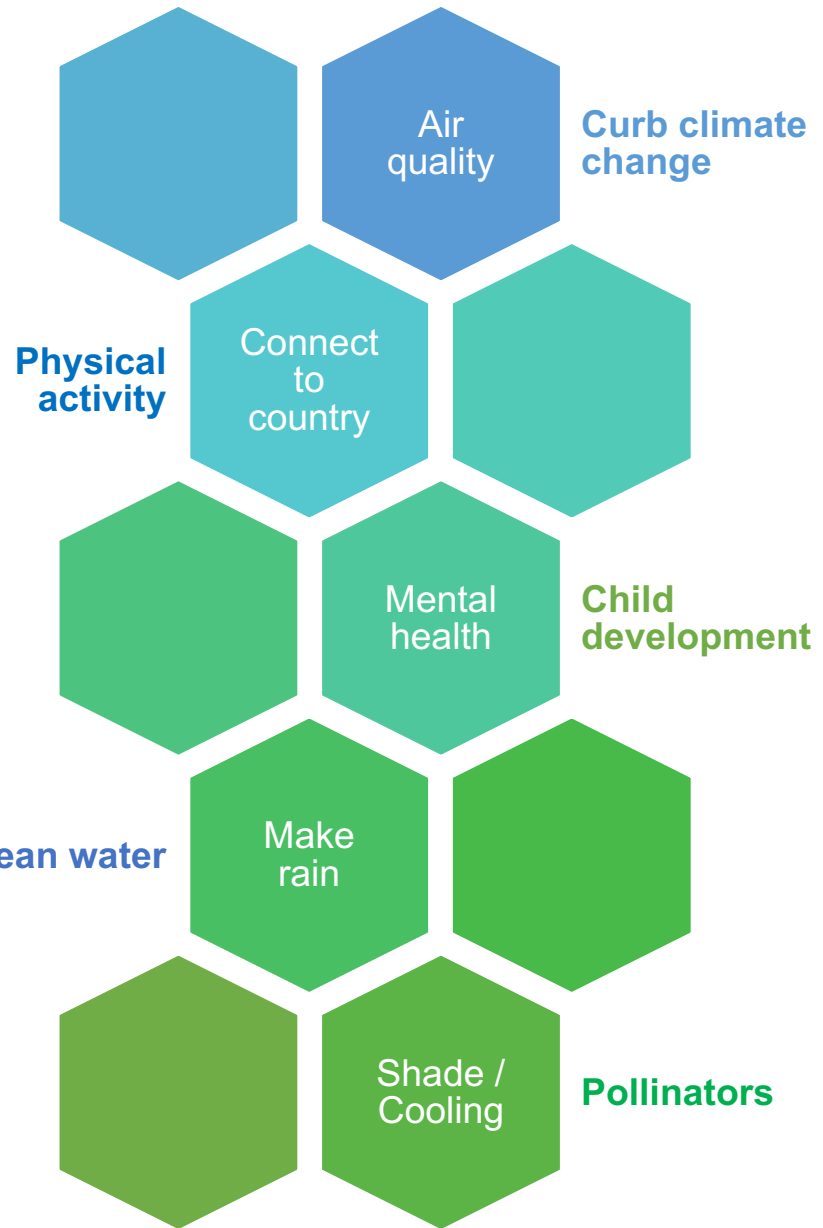
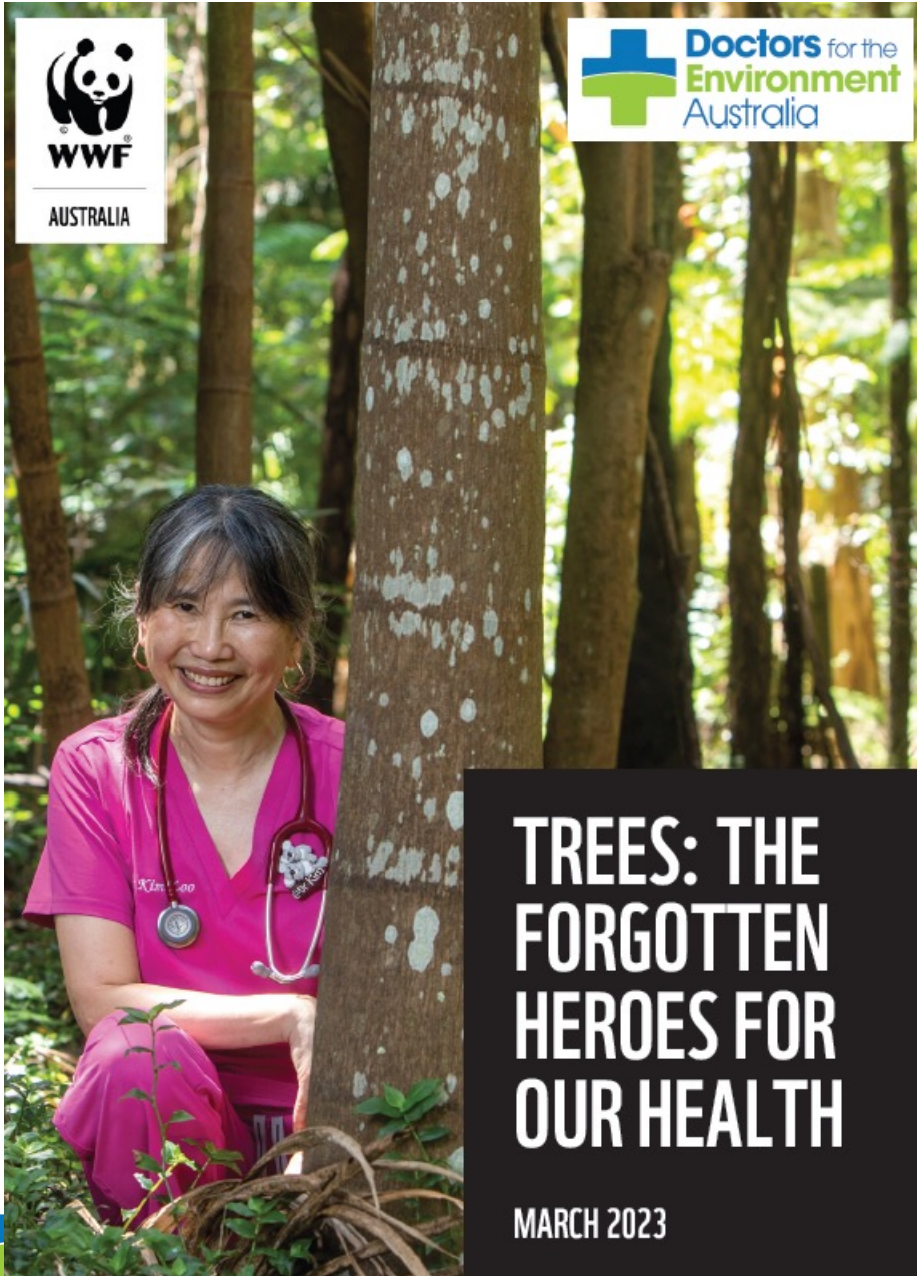
- Individual health advice is not enough
- Many people can't afford or don't have access to strategies
- Whole suburbs and regions are affected – urban heat island effect
- Social justice issue eg:
 - Renters
 - Workplaces
 - Bus stops

<https://swelteringcities.org/>

Healthcare sustainability

Healthcare sector:

- is responsible for 7% of Australia's total emissions
- contributes to waste & resource consumption,
- has a responsibility to lead mitigation
ie. 'First do no harm'
- DEA works to address these issues e.g. all electric hospitals guide
- Along with:
 - Federal, States & territory governments
 - AMA
 - Climate & Health Alliance
 - Global Green & Health Hospitals
 - Hospitals, general practice
 - Specialist colleges



Adaptation – Relocation?



Australian
National
University

INSTITUTE FOR CLIMATE, ENERGY &
DISASTER SOLUTIONS

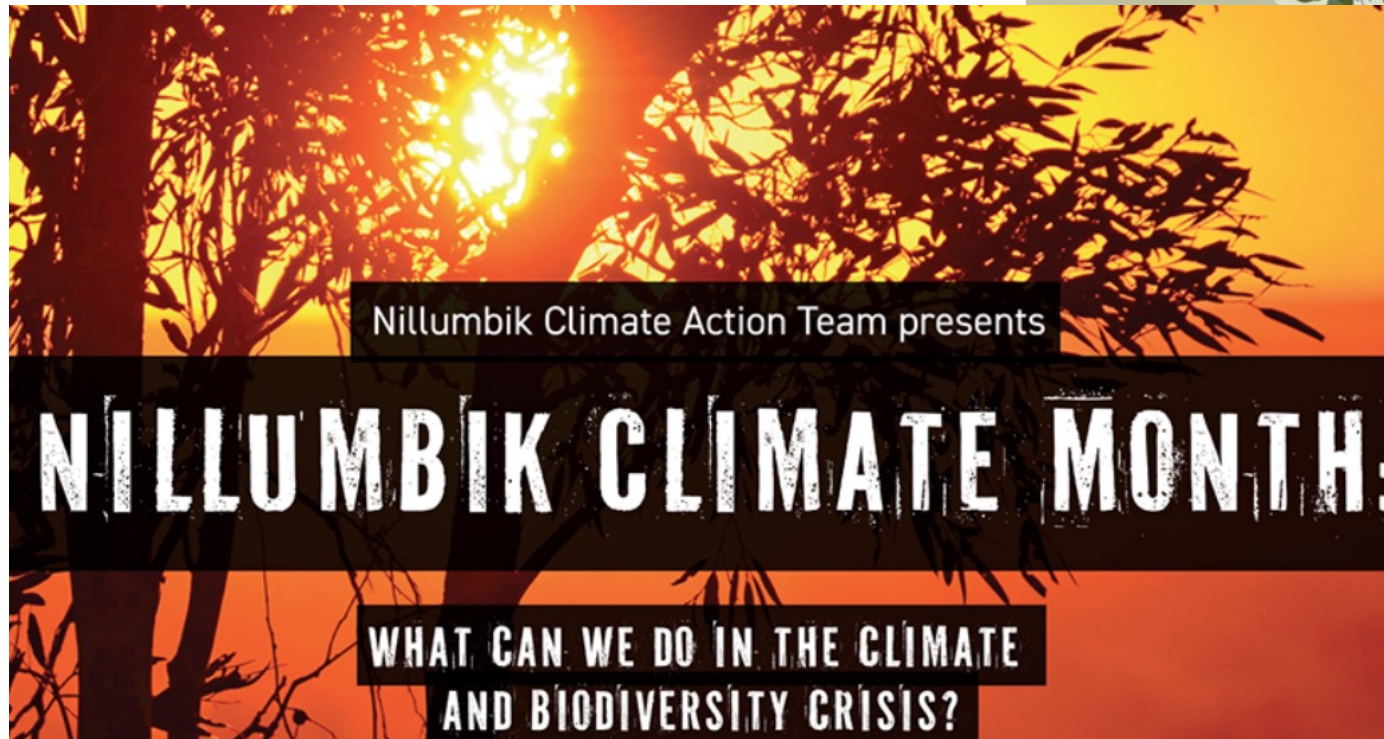
Various programs of research and education

Study of relocation

- When / who / why
- Factors – heat, natural disasters
- Economic / access
- Essential services

Study of doctors in the Northern Territory

Local action



Climate action



Cut greenhouse
gas pollution



Use renewable
energy instead



Protect the
natural world



Doctors for the
Environment
Australia



Doctors for the Environment Australia (DEA) is an organisation of doctors who recognise that human health and wellbeing require an environment; free of pollution, capable of providing nutritious food, rich in biodiversity, and able to provide for current and future generations sustainably.