KEEPING THE ELDERLY SAFE DURING HEAT-WAVES

Information for aged-care facilities, health-care workers and carers

ACCC
Adapting to Climate Change in China
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Griffith UNIVERSITY

Guangdong Provincial Center for Disease Control and Prevention

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Information for aged-care facilities, health-care workers and carers

Heat waves have a serious impact on the health of a community, particularly on those most vulnerable. Health care workers, aged care providers and carers have a key role in preventing and managing heat-stress in the elderly and chronic disease sufferers during extreme heat events

WHAT IS A HEAT WAVE?

A heat wave is an extended period of excessively hot weather, often accompanied by high levels of humidity. A heat wave is defined locally as it is relative to the normal seasonal weather in an area.

For example the Chinese Bureau of Meteorology defines a heat wave as over 35C for over 3 days.

It is projected that in the future there will be more extreme heat waves happening more often.

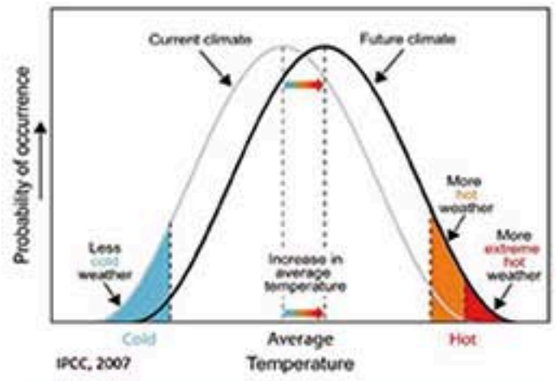


Diagram 1: Climate change and extreme weather

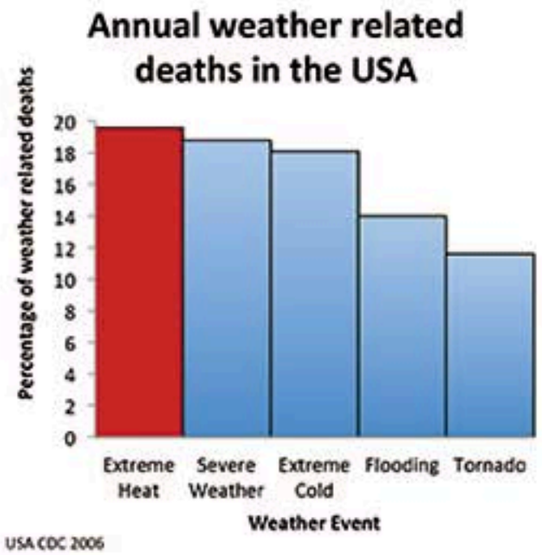
Increasing global average temperature will increase the probability of extreme weather events. In the future heat waves will be;

More extreme- the temperatures will be much hotter and the heat waves will last longer

More frequent- heat waves will occur more often

More unseasonable- heatwaves will occur at less predictable times, for example at the very start of summer or during Spring

HEALTH CONSEQUENCES OF HEAT WAVES



Extreme heat causes more deaths every year then any other weather event.

The 2003 Europe Heat Wave caused *70,000* excess deaths across Europe. As a result many countries across Europe have implemented extensive heat wave preparation plans to prevent deaths in the future.

THE BODY & HEAT

- The body maintains an ideal core temperature of 37°C through heat loss and heat gain
- The body eliminates heat through evaporation of sweat and increasing blood flow to the skin
- Certain factors and conditions reduce a persons ability to control their temperature

Some illnesses occur as a direct result of excessive heat, including heat rash, heat exhaustion and heat stroke.

Heat also exacerbates existing chronic conditions

- Cardiovascular, respiratory and kidney disease are the most common cause of death during heat waves as extreme heat increases the demand on organ systems

Many people do not recognise that their deteriorating condition is heat related

Heat related illness is largely avoidable and therefore appropriate prevention and treatment will greatly decrease the health impacts of heat waves.

All people will be affected by increased heat but some people and places will be more vulnerable than others.

During heat waves populations with a combination of increased exposure, increased sensitivity and decreased ability to adapt will be most heavily affected.

WHO IS MOST VULNERABLE

Risk factors exist at many points along the causal chain from high temperature to death. They include;

- *Factors that increase exposure* to heat such as working outdoors or around an intense heat source
- *Factors that increase sensitivity* to heat such as age and chronic disease
- *Factors that affect ability to adapt* such as social isolation, inaccessibility to cooling devices and low self-care ability.

ELDERLY

Elderly with chronic disease are especially vulnerable to health effects during heat waves as they have increased exposure, increased sensitivity to the effects of heat exposure and have limited ability to adapt their environment. Factors that contribute to their increased risk include;

- Decreased thermoregulatory capacity
  Elderly have a diminished capacity to reduce body temperature. This is due to normal physiological changes but can be exacerbated by chronic disease and behavioural limitations.
- Increased incidence of chronic disease
  As people age they are more likely to develop chronic illness. Chronic diseases are often exacerbated by extreme heat and reduce the body's ability to respond adequately.
- Prescription medication
  The elderly and those with chronic disease are more likely to be taking prescription medication. Many medications greatly reduce the body's capacity to sense and respond to heat.
- Social Isolation
  Elderly people living alone may not be aware of their risk to extreme heat or they may be unable to access the care services they require.
- Increased dehydration
  As people age they become more susceptible to dehydration. Even mild levels of dehydration can have severe consequences during extreme heat.
- Lack of control over environment
  When in care-institutions, elderly individuals have limited control over their environmental surroundings and may not be able to reduce their exposure.
- Infectious disease susceptibility
  Elderly people with chronic conditions are more susceptible to infectious disease and this risk rises during extreme heat. Heat can also increase the severity of infectious disease.
- Urban Heat island effect
  Dense urban environments typically experience greater heat due to a number of factors such as traffic and heat trapping infrastructure.

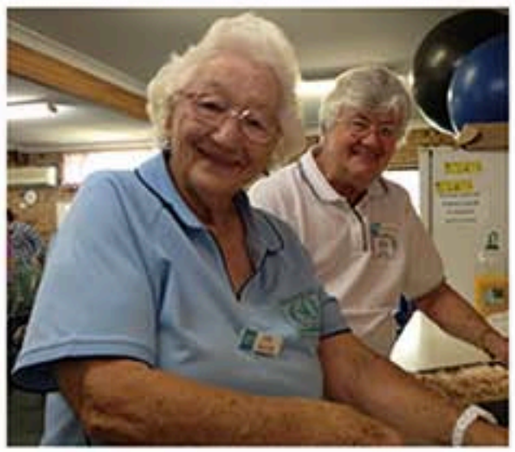
Elderly with chronic diseases such as diabetes, obesity and heart conditions are particularly vulnerable to extreme heat.

ADVICE TO HEALTH CARE WORKERS & CARE PROVIDERS;

BEFORE HEATWAVE

The most effective way to reduce the vulnerability of the elderly, particularly those with chronic illness and protect their health from heat stress is to create a ***plan and educate*** health care providers, community leaders, family and vulnerable individuals.

- *Identify individuals with increased vulnerability.*
  Identify individuals with increased vulnerability and create a regularly updated database with their contact details. Those most at risk include elderly living alone, individuals in care institutions, with decreased mobility, suffering from chronic disease and taking prescription medications.
- *Develop a heat-wave response action plan.*
  Have a simple, easy to follow heat-wave plan that can be rapidly enacted. Consult with local community groups in planning and decide on a threshold temperature for its activation. Consult with local meteorological agencies to arrange for early warnings when heat waves are likely to occur
- *Establish a "Heat-Line" phone service.*
  Using the database of identified vulnerable individuals create a phone-call service that makes regular "check up" calls during heat wave events. This strategy had enormous positive impact in many countries world-wide.
- *Communicate with patients about the risks of heat waves and incorporate this advice into routine assessments.*
  Elderly individuals should be made aware of their increased risk during extreme heat. This is especially important for those with chronic illness and taking medications. Giving them warnings and advice before a heat event will greatly improve their coping ability.
- *Implement cooling systems and ventilation where practical.*
  Consider installing air-conditioning in a "common-room" which can be accessed during heat wave conditions. Where air-conditioning is not available establish "cool-centres" at key public sites such as libraries or shopping malls and consider providing free transport to these sites for vulnerable individuals.
- *Health-care workers should review their knowledge of heat related illness.*
  Recognising and responding to heat illness is crucial in reducing its long-term impacts.



DURING A HEAT WAVE

During a heatwave there are many practical measures that can be taken to reduce the health burden of heat.

During a heat wave it is essential to ***limit exposure, enhance protective measures and adapt practices*** to reduce the health burden of heat in the elderly.

- *Provide frequent hydration.*
  Do not wait until thirst is evident to provide fluids. It is important to encourage regular sipping throughout the day to prevent dehydration.
- *Inform patients of heat wave status and activate "Heat-line" service.*
  This service is crucial in checking that vulnerable individuals are coping with extreme heat and are taking appropriate preventative measures.
- *Encourage family, friends and neighbours to make regular visits to vulnerable individuals.*
  During heat waves regular visits can further prevent heat related morbidity and mortality.
- *Ensure access to cooled environments.*
  Access to cool areas, even for a few hours a day, greatly reduces the risk of heat illness. Where air-conditioning is unavailable use a well ventilated area and use tactics such as misting. **Avoid the use of fans when temperatures exceed 35C as this can act to increase the effects of extreme heat.**
- *Encourage wearing loose, lightweight clothing.*
  This allows air to circulate the body and enhances cooling. Mobility limited individuals should be moved to areas that are air-conditioned.
- *Care centres and health institutions should increase staffing during a heat wave.* This will enable them to effectively deal with the increased demands for health services during extreme heat.

AFTER A HEAT WAVE

After a heat-wave it is important to review health care strategies.

Survey staff and patients to understand which strategies helped them and which can be improved. This will allow more tailored approaches to further prevent negative health outcomes from extreme heat.

This booklet was produced by Centre for Environment and Population Health, Griffith University in conjunction with Guangdong Provincial Centre for Disease Control and Prevention under the Adapting to Climate Change in China Project.

The Adapting to Climate Change in China Project is a joint project between China's National Development and Reform Commission, the Swiss Agency for Development & Cooperation and the UK Department of International Development and Department for Energy and Climate Change. ACCC is a policy research initiative, assisting China's response to climate change by building the evidence base needed to support policy makers across the key sectors of health, agriculture, water, disaster risk and grasslands.

Heat Related Illness and proper management

Illness	Signs & Symptoms	Management
Heat Rash	Sweat gland inflammation presenting with itchy red papules around face and neck. Occurs due to heavy sweating.	No specific treatment. Aim to minimize sweating by remaining in cool areas. Topical antihistamines may provide relief.
Heat Cramps	Painful spasms often in lower limbs. Attributed to dehydration and electrolyte imbalance following heavy sweating.	Immediate rest in cool place. Oral rehydration therapy should begin as soon as possible.
Heat Exhaustion	Pale complexion, nausea, fatigue and dizziness. Poor blood flow to brain and heart caused by excessive dehydration	Move to air-conditioned or cool area. Remove clothing and apply damp cloths or mist with water. Lay down, with legs raised to assist venous return. Commence oral or IV hydration.
Heat Stroke	Potentially fatal, hyperthermia with core temperature >40°C. Altered mental state and deliria may be present. Marked by dry skin with no sweating.	Treat immediately with IV hydration in air conditioned area. Keep skin temperature <30°C.

The following is a Chinese example prepared by Guangdong CDC that has extracted information from scientific literature to provide suggestions for strategies relevant to the local context. This will serve as a base for future action research involving relevant stakeholders to develop guidelines and concrete suggestions tailored to suit target populations in specific contexts.

Photographs

Cover photos (Left to right); Look! 2013 James Vanas(staminajim), Group 2004Neville Mars(DCF_pics), Suzhou Ladies 2012Tom Spender, Man on Street 2010Gao(Star_Trooper)

高温热浪期间如何保护老年人健康

一、什么叫高温热浪？

中国气象局规定日最高温度 35℃以上为高温天气，连续 3 天以上的高温天气过程称之为热浪。

近 100 年来，全球绝大多数地区地表气温呈增高趋势，同时城市化加速发展使热岛效应日趋明显，以致全球范围内高温热浪事件越来越频繁。我国高温热浪也呈增加趋势，2013 年 7-8 月，江南、江淮、江汉及重庆等地高温(日最高气温≥35℃)日数持续长达 15-20 天，纷纷进入"烧烤模式"。高温天气影响 19 个省、自治区和直辖市，覆盖面积达 317.7 万平方公里。

二、高温热浪为何影响老年人的健康？

高温热浪环境下，体温过高可直接导致一些疾病（如热疹和中暑等），也可使一些已有的慢性疾病恶化（如心脑血管和呼吸系统疾病等），严重者可引起死亡。例如 2003 年，欧洲各国均经历了历史罕见的高温热浪天气，其中法国受灾严重，与 2000-2002 年同期相比，8 月 1-20 日期间死亡人数增加 14729 人，其中 80%为老年人。老年人易受高温热浪影响的主要原因包括：

- **体温调节能力下降：**随着年龄增加，老年人体温调节能力不断下降。
- **患有慢性疾病：**老年人常患慢性疾病，高温热浪可致慢性疾病恶化。很多老年人常因慢性疾病而服用药物，而某些药物会降低人体对高温热浪的适应能力。
- **适应能力较差：**有些老年人独居，行动不方便，经济能力有限，信息不畅，家里缺乏降温设施，常无法获得必要的医疗卫生服务。

三、如何应对高温热浪？

3.1 高温热浪来临前

3.1.1 政府部门

- **做好城市规划和设计：**做好城市规划和土地利用，加强植树造林，降低城市热岛效应。
- **建立多部门应对机制：**明确应对高温热浪的牵头单位，建立政府统筹协调、部门配合、专人负责的高效运转机制。
- **建立预警系统：**建立符合区域特征的高温热浪健康预警系统，及时发布预警信息，并加强高温热浪防护知识宣传。
- **加强应急准备：**有关部门修改和完善高温热浪应急预案，做好物资储备，开展相关演练，提高应对能力。

3.1.2 社区

- **确定需重点保护的老年人：**掌握重点老年人（如孤寡孤独、慢性疾病患者、精神疾病或生活不能自理者）的信息，以便能及时联系到他们，提供相关服务。
- **加强健康教育：**加强对老年人高温热浪健康危害的宣传教育。
- **准备降温设施：**检查纳凉中心降温设备能否正常运转，确保高温热浪期间及时开放。

3.1.3 家庭

- **掌握高温热浪相关知识：**密切关注天气变化和高温热浪预警信息，了解高温热浪健康危害和防护的相关知识。
- **定期探访老年人：**定期探访老年人，及时了解老年人的需求和健康状况。

3.1.4 老年人

- **掌握防暑降温知识：**密切关注天气变化，重视高温热浪预警信号，了解社区防暑降温设施，掌握正确应对高温热浪的知识和措施。
- **做好防暑降温准备：**检查家中降温设备是否正常运作；备有轻薄易散热的衣服；储备一些防暑药物；保持家中通风。

3.2 高温热浪期间

3.2.1 政府部门

- **发布预警信号：**及时发布高温热浪预警信号，提醒做好应对工作。
- **启动应急预案：**根据高温热浪预警信号启动应急预案，各部门协同行动，迅速响应。
- **加强热相关疾病监测和健康教育：**做好中暑及其他热相关病例的监测、报告及救治工作。同时宣传高温热浪防护知识，提供健康服务和防暑降温咨询。

3.2.2 社区

- **提供降温纳凉场地：**及时向老年人开放纳凉中心和有空调的公共场所。
- **加强对老年人的探访：**加强对老年人尤其是孤寡孤独、精神疾病患者或者生活不能自理者、患有慢性疾病和正在服用药物者进行探访，了解他们的身体健康状况。

3.2.3 家庭

- **防暑降温措施：**把老年人安排在阴凉通风的房间，配备风扇或空调；提醒老人少出门，少量多次喝水。
- **保护重点老人：**家中若有精神障行动不便、患有慢性疾病和正在服用药物的老人，应重点进行保护。
- **有中暑症状时及时救治：**一旦发现老年人中暑，及时拨打"120"救护电话与最近的医院取得联系，立即把患者移到阴凉处或有空调的地方休息，使患者躺下，解开衣扣，两腿垫高，用湿布或冰擦拭身体。

3.2.4 老年人

- **减少暴露：**尽可能使用空调；如没有空调，可以到有空调的公共场所（如纳凉中心、图书馆、商场）避暑；尽量不要外出，非外出不可时，使用遮阳设备或选择阴凉处。
- **穿着和饮食：**穿轻薄易散热的衣服；以清淡饮食为主；少量多次饮水，不要饮用含酒精、咖啡因或糖较高的饮料。
- **正在服药者：**及时向医生咨询是否需要调整用药及调整方案。

3.3 高温热浪发生后

高温热浪结束后，有关部门应共同确定并联合发布应急响应终止信息，并根据现场报告和应急处理情况，对高温热浪的应对进行评估，以使今后更好地应对高温热浪天气。

热相关疾病和应对措施		
疾病名称	体征和症状	应对措施
中暑	是指在高温和热辐射的长时间作用下，体温超过40℃，体温调节障碍，水、电解质代谢紊乱及神经系统功能损害症状的总称，主要表现为皮肤灼热、恶心、低血压、心跳过速和呼吸急促。	立即拨打“120”等待救护，同时立即将患者移到通风、阴凉处。让患者仰卧，解开衣扣，不使冷却体温，用凉湿毛巾冷敷头部、腋下以及腹股沟等处。
热衰竭	由于身体大量失水和/或盐分所导致的一系列症状，主要包括头晕、头痛、心慌、口渴、恶心、呕吐、皮肤湿冷、血压下降、晕厥或神志模糊。	立即将患者移到空调或阴凉处，使患者躺下，两腿垫高，协助静脉回流，解开衣扣，用湿布或水擦拭身体，口服或静脉补液。
热痉挛	人体在干热环境条件下劳动，出汗过度，随汗液排出过多盐分而发生肢体和腹型肌肉的痉挛现象。	立即将移到阴凉、通风的地方休息，不快口服含盐液。
热水肿	高温会使血管扩张,而重力会使体内液体流向四肢,造成手脚肿胀。	无需特殊处理，待患者对环境适应后水肿自动消失
热衰竭	由于活动剧烈、体力消耗过大，尤其是未能及时补充体内损失的水分和盐分时容易发生热昏厥。主要症状为：感觉极度力尽，烦躁不安，头痛、晕眩或恶心；脸色苍白，皮肤感觉湿冷；呼吸快而浅，脉搏快而弱。	应尽快将患者移至阴凉通风处躺下。若患者意识清醒，应让其慢慢喝一些凉开水。若患者大量出汗，应在水中加些盐。若患者已失去意识，应让其卧姿躺下，充分休息直至症状减缓，再送至医院进一步救治。
热疹	俗称痱子，当身体周围的温度过高时，皮肤出现淡红色皮疹的一种症状。常出现在面部、脖子、上胸部、乳房下部、腹股沟和阴囊部。	无特殊处理，不要减少出汗，留在阴凉处。局部涂抹抗组胺药有一定效果。

可能促进中暑发生的药物	
药效	药物类别
导致脱水或电解质失衡的药物	利尿剂，尤其是髓袢利尿剂 任何引起腹泻或呕吐的药物（例如秋水仙碱、抗生素、可待因）
肾功能有损害的药物	非甾体类抗炎药、环胺类药物、茚地那韦、环孢菌素
受脱水影响的药物	锂、地高辛、抗癫痫类药、双胍类药物、伐汀类药物
干扰温度调节过程的药物	
干扰神经中枢的药物	神经松弛剂、血清素的受体激活剂
干扰排汗功能的药物	抗胆碱类药物 -阿托品、东莨菪碱 -三环素 -H1(第一代)抗组胺药 -某些抗帕金森病药 -某些止痉挛药 -神经松弛剂 -达舒平 -抗偏头痛药 血管收缩剂 降低心输出量 -β受体拮抗剂 -利尿药 改变基础代谢率-甲状腺素
加剧热效应的药物	
降低动脉血压的药物	所有降压药、抗心绞痛药
改变警觉性的药物	

针对老年人的高温热浪应对指南

ACCC
Adapting to Climate Change in China
Griffith UNIVERSITY
广东省疾病预防控制中心
Guangdong Provincial Center for Disease Control and Prevention

在中国适应气候变化项目资助下，这本册子由格里菲斯大学环境与人口健康研究中心，联合广东省疾病预防控制中心共同制作。