Saving lives during extreme weather in summer

Interventions from local health agencies and doctors can reduce mortality

Interest in the impact of weather on human health has grown enormously, largely due to predictions that over the next century temperatures will rise. A report in this week’s journal (p 670) indicates that among Europeans any increases in mortality related to heat will be only temporary. Other studies, however, in the United States and China have found that there will be a sharp increase in mortality related to heat if the globe warms as expected.

In some ways the argument is moot because it is clear that heat is already an important killer in many parts of the world. Weather variability, rather than heat intensity, is the most important factor defining human sensitivity to heat. People living in areas where summer climates are highly variable are ill adapted to extreme heat, mainly because it occurs irregularly. Thus, there are large increases in mortality when an intense heatwave occurs in temperate cities, such as Chicago, New York, Rome, Shanghai, and Athens. One of the difficulties in assessing the impact of potential global warming on health is the lack of understanding regarding the future variability of the climate.
variability decreases, mortality associated with heat might not increase if the world is warmer overall. However, if variability increases or stays constant the chances of increased mortality are much greater.

There has been a growing impetus to develop warning systems that would allow urban health agencies and local meteorological offices to issue advisories to the public if a dangerous heatwave is imminent.1,4 This has led to collaboration to construct heat and health watch warning systems for large cities believed to be vulnerable throughout the world. This collaboration includes partners such as the World Meteorological Organization, the World Health Organization, the United Nations Environment Programme, the US Environmental Protection Agency, and the University of Delaware. The partnership is developing warning systems for Rome, Shanghai, Toronto, and cities in the United States.

These heat and health warning systems are unlike other systems because they take into account the climate, social structure, and urban landscape of each city. Thus, the systems account for the fact that from one city to the next people react differently to the weather. In the few places where operational watch and warning systems exist, the criteria for issuing a heat advisory are often based on arbitrary weather elements that may not relate to any particular human response (such as an apparent temperature exceeding 41°C). Coordination between the local weather service, which issues the advisory, and the local health agency is often far from optimal.5 The systems currently under development acknowledge that it is an entire “umbrella of air” rather than particular weather elements that has the potential to harm health. They identify weather situations that cause stress, rather than just temperature, humidity, or other variables that might be part of an oppressive situation.

Although the thresholds under which warnings are issued vary from city to city, there is a consistency to the construction of the system. Firstly, historical relations between weather and mortality associated with heat are developed for each locale. Secondly, the most significant weather conditions that lead to increases in mortality associated with heat are identified. Next, weather forecasts for the next 48 hours are incorporated into the model, and if weather conditions that have historically led to increased mortality are predicted then a health advisory is triggered. Once the predictive system is running, a set of intervention plans is finalised to mitigate any damage to health if an advisory is issued. Finally, a method is developed to check the effectiveness of the system in saving lives.

In Philadelphia, Pennsylvania, which has an effective intervention system, the Department of Public Health takes steps every time a heat emergency is declared.6 Firstly, a contact person at the health department informs media outlets that the health commissioner has declared a heat emergency. The media then broadcasts information on how to reduce the likelihood of a heat related illness, such as staying in an air conditioned place if possible and drinking plenty of fluids. In addition, the city has a “buddy system” in which a designated person in each street checks on elderly people and ill people. The buddies are trained by the Department of Public Health; they provide support and advice and call an ambulance if necessary. The city also staffs a “heatline,” a special telephone number broadcast by the media to be used by people who are becoming ill from the heat. The department warns local utility companies not to terminate service to anyone during the heat emergency.

The system must be accurate to ensure that there are few false positives (that a heat warning was issued when it was not necessary) or even worse, false negatives (a heat warning was not called but should have been, leading to unexpected deaths). Plans are being developed to build local systems worldwide. It is imperative that health professionals become familiar with the impact of heat on health and learn to coordinate efforts with local health agencies to keep morbidity and mortality related to heat to a minimum.

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5 Predicting heat worldwide. Environ Health Perspect 1999;107:238-44A.

Can islet cell transplantation treat diabetes?  
Small studies show promise, now multicentre trials are going ahead

Type 1 diabetes mellitus is a major burden on patients and healthcare economies. The early identification of patients at risk of developing chronic complications would allow timely intervention thus reducing complications, improving the quality of life, prolonging life expectancy, and lowering the cost of treatment. The main determinant of developing chronic complications is prolonged exposure to hyperglycaemia.1 There is no doubt that intensive insulin regimens can reduce the onset and progression of complications from diabetes but they are non-physiological and have an increased risk of causing...