

Heat Health in the Bendigo Loddon PCP

Information Paper

Heat health temperature thresholds

The Department of Health (the Department) has identified heat health temperature thresholds above which increases in health service demand and increased mortality are observed. The thresholds are based on a range of evidence and information including:

- Registry of Births, Deaths and Marriages (registered deaths by date of death)
- State Coroner's Office (death referrals)
- Melbourne Medical Deputising Service (locum consultations)
- Ambulance Victoria (dispatches)
- NURSE-ON-CALL (phone call records)
- Public hospital emergency departments (presentations)
- Bureau of Meteorology (24-hour minimum and maximum temperatures).

This research indicates that the adverse consequences of extreme heat are not only related to maximum daily temperatures, but also to the extent of relief afforded by night time temperatures. As a result, heat health alerts are issued by the Department based on a forecast for the *mean temperature* (the average of the forecast daily maximum and the forecast overnight minimum temperature). The Department's heat health temperature thresholds have been developed to notify councils, hospitals and health and community service providers of extreme heat or heatwave conditions which are likely to impact on human health.

A heat health temperature threshold has been established for each of Victoria's nine weather forecast districts. The Bendigo Loddon PCP is located within the Northern Country weather forecast district. The heat health temperature (mean) threshold for the Northern Country district is 32°C.

Increased vulnerability

Department of Health analysis of Emergency Department presentations in *the Melbourne metropolitan area** indicates that those persons less likely to present to a hospital emergency department with a heat-related condition included the very young and those living in residential aged care facilities; whereas those in the following key demographic groups were much more likely to present to a hospital emergency department with a heat-related condition:

- **People aged 65 years or over** - who were four times more likely to present to a hospital emergency department with a heat-related condition than people from any other age group
- **People born in Australia** - who were 1.6 times more likely to present to a hospital emergency department with a heat-related condition than people born overseas, and
- **People who lived alone in a private residence** - who were 1.5 times more likely to present to a hospital emergency department with a heat-related condition than people living in other types of accommodation or living arrangements.

* Data from areas in regional Victoria was not available at the time of writing.

Frequency of heat health threshold days

The table below summarises the incidence of days above the Northern Country heat health temperature threshold at weather stations in or near the Bendigo Loddon PCP catchment since 2009/10. There are only two weather stations located in the Bendigo Loddon PCP catchment that collected the required daily temperature data for the nominated years. Therefore, a number of weather stations close to the PCP boundary have been included in the table below to attempt to represent the geographic distribution of heat health threshold days across the region. Please note that the figures are for *mean* daily temperature (the average of the recorded daily maximum and the recorded overnight minimum temperature).

Heat health threshold days in and around Bendigo Loddon PCP - mean $\geq 32^{\circ}\text{C}$ (2009/10 - 2013/14)

| Year | Month | Greater Bendigo | | Adjacent or Close to Bendigo Loddon PCP Boundaries | | | |
|---------|--------------|--------------------------------|--------------------------------|--|--------------------------------|--------------------------------|--------------------------------|
| | | Bendigo Airport | Redesdale | Charlton [#] | Kerang [#] | Kyabram | Echuca |
| | | No. of days threshold exceeded | No. of days threshold exceeded | No. of days threshold exceeded | No. of days threshold exceeded | No. of days threshold exceeded | No. of days threshold exceeded |
| 2009/10 | Nov | | | | | | |
| | Dec | 1 | | 1 | 1 | 1 | 2 |
| | Jan | 1 | 1 | 2 | 2 | 1 | 1 |
| | Feb | | | | | | |
| | Total | 2 | 1 | 3 | 3 | 2 | 3 |
| 2010/11 | Nov | | | | | | |
| | Dec | | | | | | 1 |
| | Jan | | | 1 | 1 | | 1 |
| | Feb | | | | | | |
| | Total | 0 | 0 | 1 | 1 | 0 | 2 |
| 2011/12 | Nov | | | | | | |
| | Dec | | | | | | |
| | Jan | | | 1 | | | 1 |
| | Feb | | | | | | |
| | Total | 0 | 0 | 1 | 0 | 0 | 1 |
| 2012/13 | Nov | | | 1 | 1 | | 1 |
| | Dec | | | 1 | 1 | | 1 |
| | Jan | | | 2 | 3 | 2 | 3 |
| | Feb | | | | | | |
| | Total | 0 | 0 | 4 | 5 | 2 | 5 |
| 2013/14 | Nov | | | | | | |
| | Dec | | | 1 | 1 | | |
| | Jan | 4 | 4 | 5 | 5 | 4 | 4 |
| | Feb | 3 | | 2 | 3 | 1 | 2 |
| | Total | 7 | 4 | 8 | 9 | 5 | 6 |

Calculated from Bureau of Meteorology data in accordance with DoH Extreme Heat Event methodology. [#]Charlton and Kerang are located in the Mallee weather forecast district but are situated close to the border of the Bendigo Loddon PCP catchment

Multiple day heat events

The research undertaken by the Department also indicates that there is an escalating risk of adverse heat health consequences where there are subsequent days of high temperature. The Department's analysis of health service activity in the *Melbourne metropolitan area* indicates that, after a single day exceeds the mean daily temperature threshold, subsequent days with temperatures up to 4 degrees *lower* than the single day threshold can be associated with further escalation in heat related illness.

The subsequent day heat health mean daily temperature threshold for the Melbourne metropolitan area is 26-28°C mean maximum (following a day of mean daily temperature of 30°C or higher).

Unfortunately, heat health temperature thresholds for subsequent days have not yet been established for other weather forecast districts in Victoria.

However, an approximation has been prepared, *as a guide only*, for the Northern Country weather forecast district based on the assumption that the 4°C lower threshold temperature for subsequent days observed in the Melbourne metropolitan area also applies to other districts. Note that this approximation was not prepared or approved by the Department of Health.

Based on the assumption that the 4°C lower threshold temperature for subsequent days observed in the Melbourne metropolitan area may also apply to other districts, the heat health daily mean temperature threshold for subsequent days could potentially be 28-30°C (following a day of mean daily temperature of 32°C or higher). Again, it is stressed that this a rough approximation only.

There are only two weather stations located in the Bendigo Loddon PCP catchment that have collected the necessary temperature data in the required years, therefore, a number of weather stations close to the PCP boundary have been included in the table to attempt to represent the geographic distribution of heat health events across the region.

Hypothetical Multiple / Subsequent Day Extreme Heat Events – Mean Temperature – (2009/10 to 2013/14)

| | Date event commenced | Number of consecutive days |
|-----------------------------|----------------------|----------------------------|
| Bendigo Airport | 14 Jan 2014 | 4 |
| | 01 Feb 2014 | 2 |
| Redesdale | 14 Jan 2014 | 4 |
| Charlton[#] | 10 Jan 2010 | 2 |
| | 31 Jan 2011 | 4 |
| | 02 Jan 2012 | 2 |
| | 19 Dec 2013 | 2 |
| | 13 Jan 2014 | 5 |
| Kerang[#] | 10 Jan 2010 | 2 |
| | 31 Jan 2011 | 5 |
| | 29 Nov 2012 | 2 |
| | 04 Jan 2013 | 4 |
| | 19 Dec 2013 | 3 |
| | 13 Jan 2014 | 5 |
| Kyabram | 01 Feb 2014 | 2 |
| | 11 Jan 2010 | 2 |
| | 04 Jan 2013 | 2 |
| Echuca | 14 Jan 2014 | 4 |
| | 31 Jan 2011 | 4 |
| | 02 Jan 2012 | 2 |
| | 29 Nov 2012 | 2 |
| | 04 Jan 2013 | 2 |
| | 14 Jan 2014 | 4 |
| | 02 Feb 2014 | 2 |

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Bibliography

Heat Health Alert System - Information and Guidance - Victorian Government, Department of Health 2013

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