



MONASH University

# Older People and Heat: Learning From the Adaptations of an Older Farming Community

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Image credit: <http://www.healthspablog.org/heart-health/heart-health-precaution-in-sight-of-the-heat>

# Climate change and health

- Climate “is now changing more quickly than in the ‘geological past’ ” (CSIRO, 2011)
- The biggest global health threat of the 21st Century (Costello et al., 2009)
- Heat-related deaths in temperate Australian cities predicted to rise from 1,115 per year in 2003 to 2,300–2500 by 2020 and 4,300–6,300 by 2050 (McMichael et al., 2003)
- Rural & remote locations even more vulnerable to climactic events & have less access to services (Horton et al., 2010)



Image credit: <http://www.abc.net.au/news/2009-05-01/a-heat-warning-message-sent-to-at-risk-residents/1165706>

# Vulnerability of older people to heat

## Why more vulnerable?

### ■ Compositional factors

- Changes in thermoregulatory systems, reduced physiological reserve, & increased incidence of chronic disease (Unглаub Silverthorn, 2010)

### ■ Contextual factors

- More likely to live alone & be socially isolated (Warburton and Lui, 2007)
- Reduced physical activity & more reliant upon air conditioning (Hansen et al., 2011)

**Recent example** - 2009 Victorian heatwave:  
374 excess deaths, majority of which were 75+

Herald Sun, January 27, 2009



# Need to plan for heat and learn from older people

- Older people have dealt with heat events throughout their lives, including prior to advent of air conditioning.
- This is particularly the case for those **living in heat-exposed rural settings.**
- There is much to learn from them in terms of behavioral strategies and environmental adaptations.
- This could inform other communities including those in urban areas.



Image credit: <http://www.giantbomb.com/forums/off-topic/31/its-hot/553547/>



# Aim

The current project seeks to learn from the behavioural and household adaptations used by older people from a farming community in Northern Regional Victoria which regularly faces extreme summer temperatures.

Based on the mean maximum temperatures in January for the last 30 years, this area is around 5°C hotter during summer than Melbourne (Bureau of Meteorology, 2012) and so represents the average temperature levels that may be faced in Melbourne in 2070 under a high emissions climate change future (Whetton, 2011).

# Methods

- Mixed methods study over a 6-week period in Feb-March 2012 involving people aged 55+ living independently in the community recruited via snowball sampling.
- Stage 1 – Focus group discussion on risks and protective behaviours associated with heatwaves.
- Stage 2 – Household visit to conduct semi-structured interview (demography, health, vulnerability, behaviour, housing stock, and household adaptations to keep cool).
- Stage 3 – Thermal monitors installed in houses and centre of community and participants asked to complete a thermal comfort diary using the ASHRAE (1996) 7-point scale.

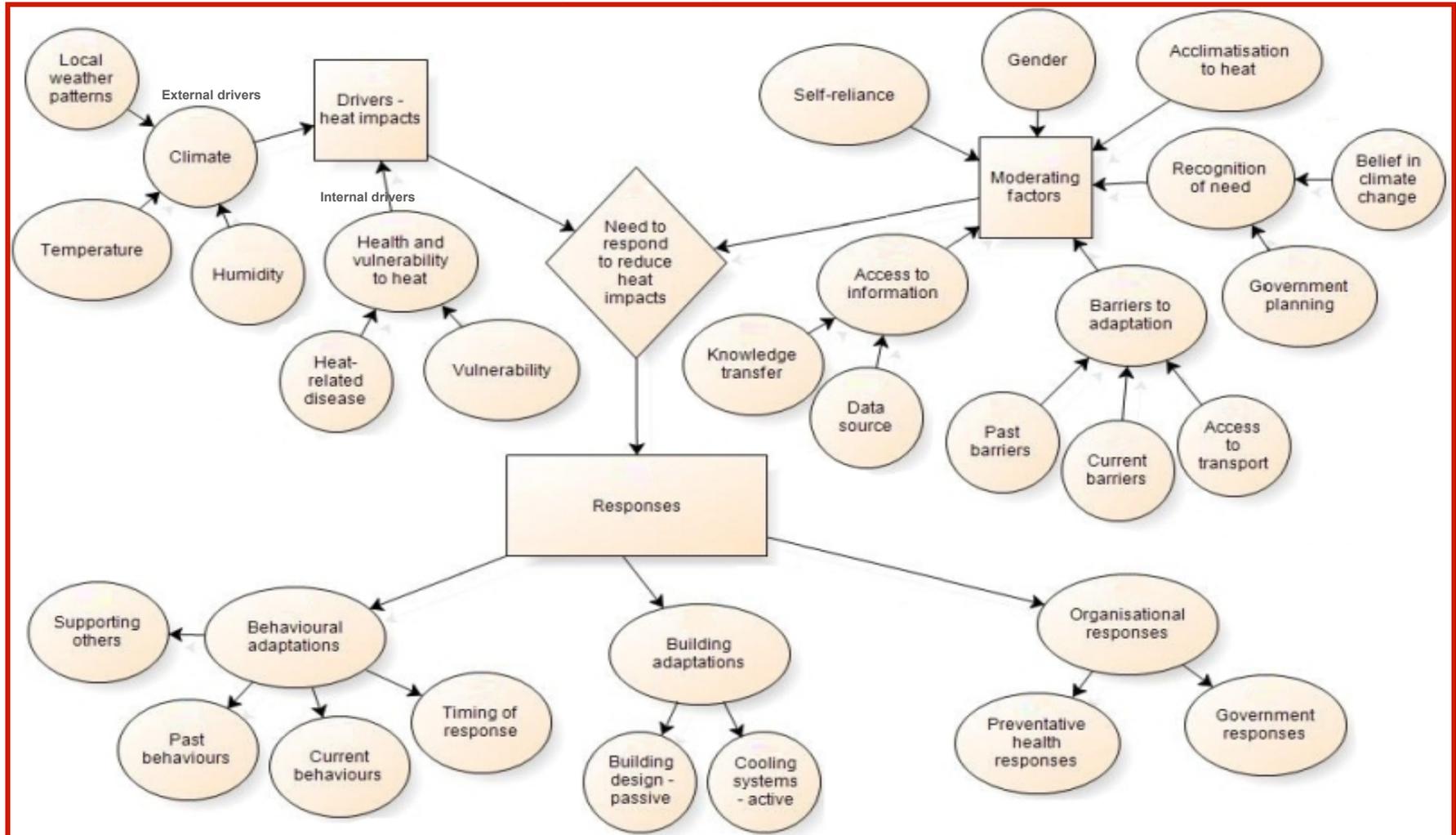
Cold -3	Cool -2	Slightly Cool -1	Comfortable 0	Warm +1	Hot +2	Very Hot +3
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# Results

1. Focus group discussions
2. Household interviews
3. Temperature measures

# Results - Focus group discussions



# Results - Focus group discussions (Cont.)

## Key behavioural adaptations to heat used in the past

Adaptive behaviour	Examples provided
Moving to a cooler space, particularly to sleep	Air space in the dairy, sleeping outside
Utilising water	Placing wet sheets over basinetts, or water in front of fans or windows, plus having a cool shower or bath
Cross-ventilation	Opening windows and doors to let heat out and cooler air into the house
Timing behaviour to avoid heat	Being more active first thing in the morning or in the evening and avoiding the heat of the day
Avoiding activities that increase the temperature	Not lighting the wood stove on hot days

# Results - Focus group discussions (Cont.)

Key themes:

Reliance upon air-conditioning

*'The air-conditioned cars and air-conditioned supermarkets make it not a problem.'*

Heat was not seen as a threat

*'A lot of times in summer it doesn't worry anyone. If it gets hotter in the summer, too bad.'*

Humidity seen as a greater concern

*'You feel it more.'* *'But it was a drier heat; you got far less humidity then.'*

Recognition that modern housing is maladaptive

*'the newest designs have no eaves or verandas or anything'*

Lack of awareness of heat warnings, heatwave plans etc and reliance instead on own experience.

## Results - Focus group discussions (Cont.)

Farming practices like the development of an extensive canal network cutting through the town were seen to have possibly altered the local climate.

*‘But it was a drier heat, you got far less humidity then.’*

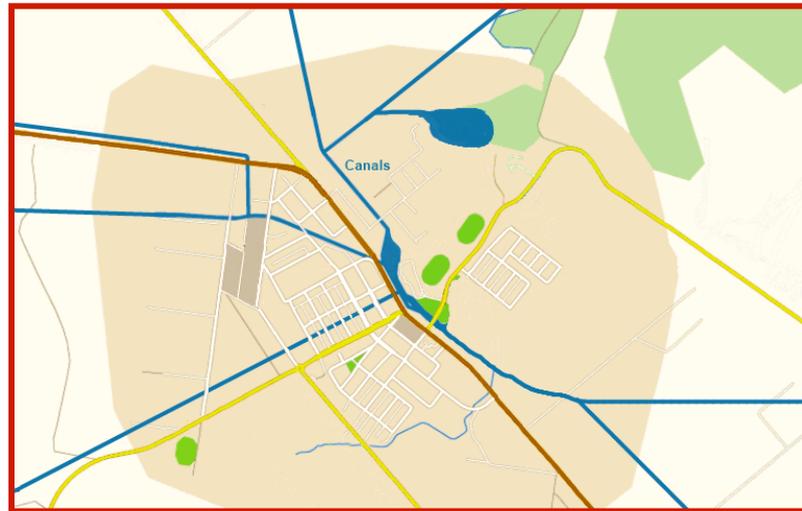


Image credit: adapted from <http://maps.google.com.au>

This is beyond the capacity of the current project to verify, but it does raise interesting questions.

## Results – Household interviews

- Overall, participants were healthy, independent, and socially and physically active.
- All had modified their homes and gardens with environmental adaptations which moderate heat.

All participants maintained a garden (either independently or with support from family and friends) which helps to moderate the household micro-climate

Over half the households had extensive vegetative shading and three quarters having external pergolas or outdoor shade areas.

## Results – Household interviews (cont.)



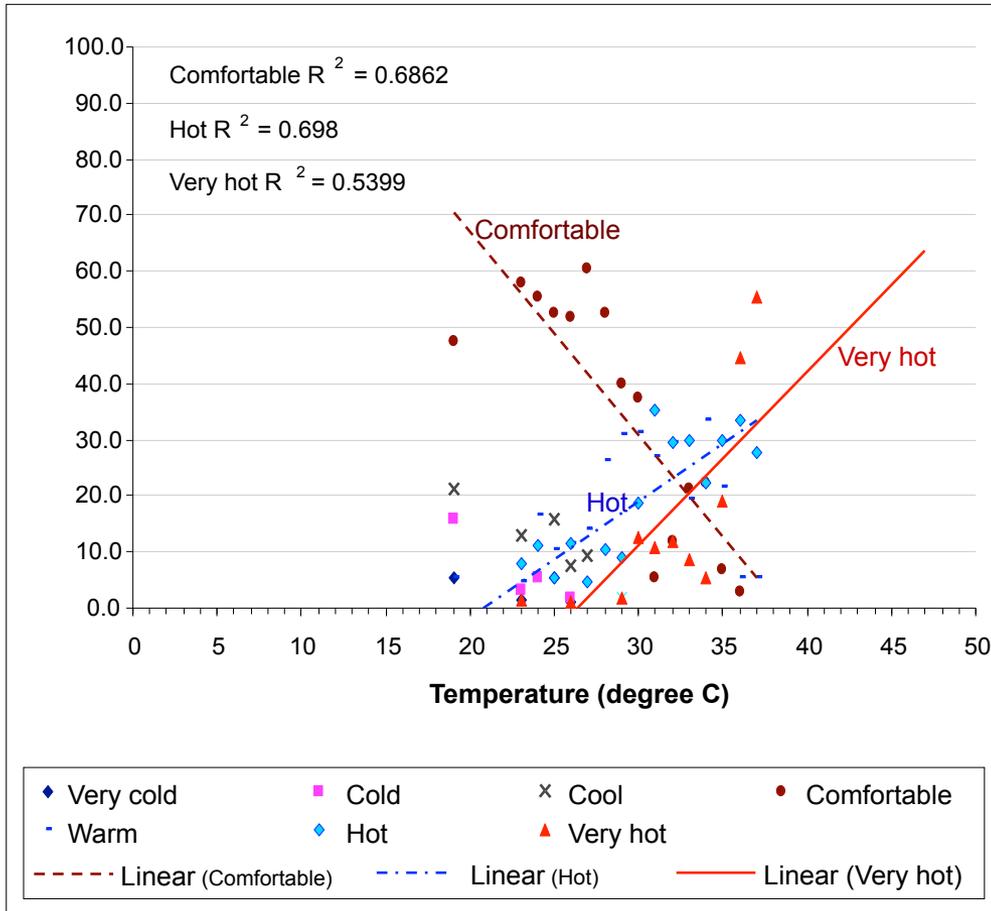
Almost half the households utilised blinds to block out the heat.

Nearly all the homes were insulated, with approximately one third using solar power.

But, all had at least one air-conditioning unit.



# Results – Temperature measures



50–60% reported feeling comfortable at temperatures below 28°C.

By 37°C, only 2.8% reported feeling comfortable.

Proportion feeling ‘very hot’ rose sharply above 37°C.

Very few felt ‘very hot’ below 30°C suggesting the group is acclimatised to heat.

# Discussion

- Current health promotion strategies identify air-conditioning as the key strategy to reduce heat health risk for older people.
- Even in this heat adapted community with a long history of responding to heat A/C has become the primary strategy.
- However, A/C is expensive to install and use, can be complicated to use, is environmentally maladaptive, has the potential to increase vulnerability, and is not reliable during heat events ( ‘brown outs’ ).
- So alternative strategies are required.

# Conclusions – possible future directions

- Undertake a health promotion campaign to raise awareness of the impact of heat, particularly in a climate change future.
- Create tip-sheets highlighting the behavioural & household adaptations used by this older farming community.
- Advocate for more climate appropriate building standards
- Put strategies in place to develop resilient communities which can look after themselves during heat events.



# References:

- ASHRAE. (1966). Thermal comfort conditions. Standard 55-60. *American Society of Heating, Refrigeration and Air-Conditioning Engineers* (pp. 2). New York.
- Australian Bureau of Meteorology. (2012). Climate statistics for Australian locations: Climate data online. Retrieved July 8, 2012, from [http://www.bom.gov.au/climate/averages/tables/ca\\_sa\\_names.shtml](http://www.bom.gov.au/climate/averages/tables/ca_sa_names.shtml).
- Costello, A., Abbas, M., Allen, A., Ball, S., Bell, S., Bellamy, R., Friel, S., Groce, N., Johnson, A., Kett, M., Lee, M., Levy, C., Maslin, M., McCoy, D., McGuire, B., Montgomery, H., Napier, D., Pagel, C., Patel, J., de Oliveira, J. A. P., Redclift, N., Rees, H., Rogger, D., Scott, J., Stephenson, J., Twigg, J., Wolff, J., & Patterson, C. (2009). Managing the health effects of climate change. *The Lancet*, 373 (9676): 1693-733.
- Hansen, A., Bi, P., Nitschke, M., Pisaniello, D., Newbury, J., & Kitson, A. (2011). Older persons and heat-susceptibility: The role of health promotion in a changing climate. *Health Promotion Journal of Australia*, 22 (Special issue): S17-S20.
- Horton, G., Hanna, L., & Kelly, B. (2010). Drought, drying and climate change: Emerging health issues for ageing Australians in rural areas. *Australasian Journal on Ageing*, 29 (1): 2-7.
- Mapstone, B. (2011). Introduction. In H. A. Cleugh, M. Stafford Smith, M. Battaglia & P. Graham (Eds.), *Climate change: Science and solutions for Australia* (pp. IX-XII). Collingwood, Victoria: CSIRO Publishing.
- McMichael, A. J., Woodruff, R., Whetton, P., Hennessy, K., Nicholls, N., Hales, S., Woodward, A., & Kjellstrom, T. (2003). Human health and climate change in Oceania: a risk assessment 2002. Canberra: Commonwealth of Australia. [www.health.gov.au/internet/main/publishing.nsf/content/2D4037B384BC05F6CA256F1900042840/\\$File/env\\_climate.pdf](http://www.health.gov.au/internet/main/publishing.nsf/content/2D4037B384BC05F6CA256F1900042840/$File/env_climate.pdf).
- Unglaub Silverthorn, D. U. (2010). *Human physiology an integrated approach* (5th ed.): Pearson Benjamin Cummings, San Francisco.
- Warburton, J., & Lui, C. (2007). Social isolation and loneliness among older people: A literature review. Brisbane: Australasian Centre on Ageing, The University of Queensland.
- Whetton, P. (2011). Future Australian climate scenarios. In H. A. Cleugh, M. Stafford Smith, M. Battaglia & P. Graham (Eds.), *Climate change: Science and solutions for Australia* (pp. 35-44). Collingwood, Victoria: CSIRO Publishing.