



CITY

RESILIENCE

ACUTE SHOCKS AND
CHRONIC STRESSES
FOR
MELBOURNE

BRIEFING PAPER



THE UNIVERSITY OF
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CITY RESILIENCE: ACUTE SHOCKS AND CHRONIC STRESSES FOR MELBOURNE

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The City of Melbourne will continue to face challenges and threats with increasing frequency and complexity, which will hinder our ability to survive and thrive if unaddressed.¹⁻³ Critical to improving urban resilience is a better understanding of what acute shocks and chronic stresses we need to be prepared for and respond to, now and in the future. Shocks are intense, acute or sudden events or phenomena that threaten a community, such as heatwaves, floods, pandemics, and bushfires.^{4,5} Stresses are chronic (ongoing or cyclical) challenges that weaken a city's fabric and ability to function.^{4,6} This research undertaken through the City of Melbourne Chair of Urban Resilience and Innovation aimed to update the evidence base on potential acute shocks and chronic stresses facing the municipality of Melbourne, to highlight the importance of city resilience.

KEY FINDINGS

The research identified the following 10 priority acute shocks and chronic stresses for City of Melbourne, combining the results of a literature review, desk-top risk assessment, and stakeholder engagement (Table 1).

Table 1: Ten priority acute shocks and chronic stresses for City of Melbourne

PRIORITY ACUTE SHOCKS	PRIORITY CHRONIC STRESSES
Heat	Increasing income/ social inequalities
Floods	Increasing non-communicable diseases, including mental illness
Storm	Drought/less rainfall
Pandemic	Unaffordable housing
Disrupted urban water supply	Food insecurity
Bushfire	Biodiversity loss
Communications and phone network failures	Declining social cohesion
Blackout/electricity supply disruption	Poor quality housing
Civil unrest	Loneliness/ social isolation
Business closure and job losses	Family violence

INTERDEPENDENCIES

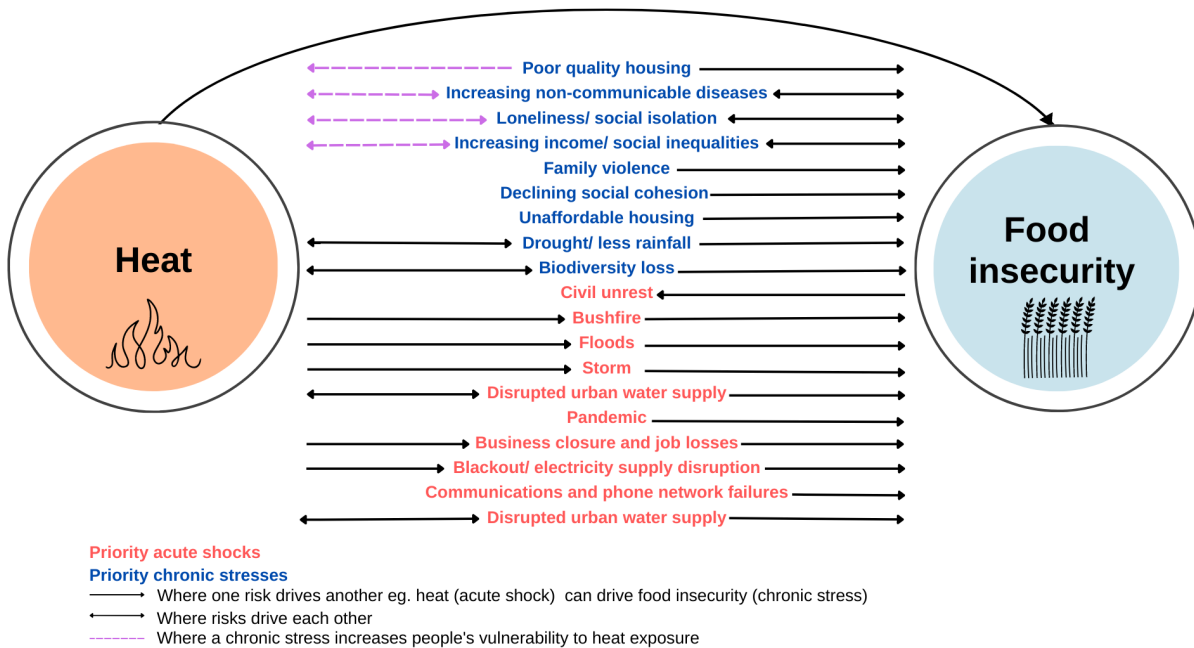
Multiple acute shocks and chronic stresses often occur concurrently, overlap or within close succession in cities, including Melbourne.^{3,6,9} Challenges can be interrelated (e.g., one leading to another).⁵ For example, heatwaves can lead to blackout/electricity supply disruption; and storms can cause flooding. There are also complex interrelationships between different chronic stresses, for example the links between social isolation and mental health issues. Income inequality is known to be associated with many other chronic issues, including food insecurity, poor housing, mental illness and other non-communicable diseases.¹² Cities need to be mindful of these determinant pathways, as well as compounding impacts of multiple acute shocks and chronic stresses occurring simultaneously. Multiple disasters have impacts that go beyond the consequences of single disasters.² The impacts of acute shocks may also be worse when chronic stresses such as social inequality, drought or food insecurity have weakened the resilience of a community over time.⁹

The interdependencies between multiple acute shocks and chronic stresses are therefore important considerations in preventing and responding in a holistic way, and an important area for future research.¹³ Interdependencies can differ according to the city context, area, time, and the circumstances or characteristics of the particular shock or stress. For example, no two shocks (e.g., two different floods) are

experienced in the same way. The Figure below illustrates potential interdependences between heat waves and food insecurity¹, and other priority hazards for the City of Melbourne.

The direction of the arrows indicates where one hazard drives another. While this demonstrates the type of interdependence mapping required, the complex interrelationships between all shocks and stresses are not shown here. More detailed analysis of interconnections between all priority issues in a relevant setting would be required to support decision-making and responses. Complex thinking and modelling could usefully inform approaches to mapping the full array of interdependencies between acute shocks and chronic stresses.^{15,16}

Interrelationships between heat, food insecurity and other priority shocks and chronic stresses for City of Melbourne



OPPORTUNITIES FOR RESILIENCE

While challenging to address, interdependencies provide opportunities to achieve multiple benefits through resilience building activities.^{13,17} Cities should look for opportunities where programs, policies and strategies can have co-benefits by addressing multiple issues and/or determinants concurrently. Such activities can build general resilience, by helping cities prevent, prepare for, and respond to known and unknown future threats.^{8,18} For example, urban greening strategies can yield multiple benefits for reducing urban heat island effects, improved air quality, encouraging physical activity and fostering mental health.¹⁹⁻²² Addressing one challenge could have flow-on benefits for prevention and amelioration of other shocks and stresses.

In any assessment of acute shocks and stresses, it is important to consider interdependencies between challenges. The ten priority acute shocks and chronic stresses for City of Melbourne identified in this report have a range of determinants, including other shocks and stresses on the list, which would need to be addressed in a holistic way as part of prevention and response. Understanding the complex relationships between different challenges may require further research.⁶ The processes by which interdependencies could be identified for particular communities, and in specific situations and times may differ depending on circumstances and resources available, but could include wider community engagement as discussed above, quantitative data analysis and mapping, and complex modelling of potential future scenarios.

¹ Food insecurity is when people do not have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active, healthy lifestyle at all times.¹⁴ City of Melbourne. Food insecurity in the City of Melbourne. Melbourne: City of Melbourne, 2021.

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