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# Collateral Damage: The Cardiovascular Cost of Suppressing COVID-19 Transmission in Australia



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On April 23 2020, the Australian flag was projected on the Matterhorn in Switzerland in a message of hope and solidarity during the COVID-19 pandemic. Indeed, at time of writing, Australia has successfully suppressed COVID-19 transmission compared to Europe and North America, with an extremely low notification rate of 3.4 per 100,000 population in the context of a high case ascertainment rate [1]. This is, in part, attributable to a national consensus on COVID-19 policies, early closure of international borders and the public's high degree of compliance with social-distancing guidelines, predicated on the rapid escalation of cases in early March 2020 [2]. We draw attention to avoidance behaviour in patients with acute coronary syndrome (ACS) during the COVID-19 pandemic in Australia—an unwanted consequence of strategic national policies and intense media saturation, leading to a disproportionate level of risk perception in a country with a very low prevalence of COVID-19.

Anecdotal reports have suggested that cardiac presentations in Australia have dropped by 30% during the COVID-19 pandemic [3]. At our institution, we observed a 32% reduction in ST-segment elevation myocardial infarction (STEMI) cardiac catheterisation laboratory (CCL) activations from 15 March to 15 May 2020, the period when strict social measures were enforced, compared to the same 2-month period in 2019 (15 cases [7.5 activations per month] compared to 22 cases [11 activations per month]). There were 134 cases (average of 11.2 activations per month) during the 12-month period from 15 March 2019 to 15 March 2020.

On 25 March 2020, the Australian government cancelled all non-urgent elective surgeries. In line with this, the Cardiac Society of Australia and New Zealand (CSANZ) endorsed a Consensus Statement that recommended a high threshold for acute cardiology admissions and suggested that stable angina and troponin-negative chest pain may be managed in an outpatient setting [4]. On 30 March 2020, the Australian government introduced telehealth items to substitute for face-to-face specialist consultations for all Medicare-eligible Australians. Selective use of finite resources of personal protective equipment (PPE) and the need to minimise invasive and non-invasive procedures in order to redirect resources to COVID-19 care, suppress COVID-19 transmission and protect health care workers from exposure to the disease have resulted in departures from previous standards of care [5]. These factors combined with the influence of strict social measures and intensive media coverage have also cultivated a culture of fear of seeking medical care leading to irrational avoidance behaviour and delayed presentations with significant health consequences.

Avoidance behaviour leading to a significant reduction in ACS-related hospitalisations and dire clinical outcomes has also been reported in northern Italy during the COVID-19 pandemic and has become known as 'collateral damage' [6]. Similarly, an analysis of nine high-volume CCLs in the United States during the early phase of the COVID-19 pandemic observed a 38% reduction in STEMI CCL activations, suggesting that there were a significant number of STEMI patients who did not seek medical attention [7].

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The seminal study of avoidance behaviour, which quantified the negative psychological responses contributing to this phenomenon, was a population-based survey during the initial stage of the H1N1 pandemic in Hong Kong in 2009 [8]. In this study, 63.4% of respondents reported that they avoided going to hospitals during the pandemic. Unconfirmed beliefs about modes of transmission, perception that H1N1 would cause severe irreversible bodily damage and worry that oneself or a family member would contract the disease were independent predictors of avoiding visiting hospitals (odds ratio 1.47–1.81,  $p < 0.05$ ). Interestingly, a survey of Sydney residents during the same pandemic in 2009 documented a very different community attitude towards H1N1, appropriate within a low-prevalence community. Only 21.4% of respondents perceived that their risk of catching H1N1 was high and 57.1% did not think that their health would be very seriously affected if they were infected [9].

It is evident that the level of risk perception in Australia has substantially increased during the current COVID-19 pandemic. Understanding the collateral damage issue is critical as health care services move forward and prepare for the second wave of cardiovascular disease in the post-COVID-19 era, aptly termed ‘the impending tsunami’ [10].

A recent study describing the impact of the COVID-19 pandemic on STEMI care in Hong Kong demonstrated a long delay in median door-to-device time compared with historical data from the previous year (110 mins compared with 84.5 mins), which was attributed to the implementation of stringent infection control measures [11]. There was an even longer delay in median time from symptom onset to first medical contact (318 mins compared with 82.5 mins).

In Australia, primary percutaneous coronary intervention (PPCI) in a dedicated COVID-19 CCL with PPE including N95 masks when appropriate for all staff remains the standard of care [4,12]. Delays are to be expected but workflow can be expedited by CCL preparedness including training in PPE. The CSANZ Consensus Statement only recommends consideration of thrombolysis for select STEMI patients with confirmed or suspected COVID-19 without high risk features (anterior ST-elevation, cardiogenic shock and/or life-threatening arrhythmias) [4]. Similarly, the Consensus Guidelines of the CSANZ Interventional Council and COVID-19 Interventional Cardiology working group recommends that thrombolysis should be considered in lytic-eligible patients with high exposure risk of COVID-19 without a strong indication for urgent cardiac catheterisation, i.e. clear evidence of ongoing severe ischaemia by the presence of symptoms and electrocardiographic changes refractory to medical therapy or haemodynamic instability [12]. It is concerning that some Australian centres have interpreted these statements as a rationale to potentially convert to a routine thrombolysis strategy for all STEMI patients, unnecessarily compromising the standard of care for a vulnerable subpopulation within a community with an extremely low prevalence of COVID-19 [13].

In summary, we highlight three key points: 1) In Australia, a disproportionate level of risk perception during

the COVID-19 pandemic has contributed to a significant burden of collateral damage. The notification rate of COVID-19 may be 3.4 per 100,000 population but the proportion of missing STEMI patients may be more than 30%. 2) As cardiologists, we play a critical role in the mitigation of avoidance behaviour, which can have disastrous cardiovascular consequences. While this phenomenon has been widely described in Europe and North America, it is concerning that such behaviour is just as common in Australia, a country with a very low prevalence of COVID-19. The challenge will be rectifying misconceptions and reassuring patients that seeking medical care in hospitals is safe. 3) Where possible, we must not compromise the standard of care for STEMI patients in the COVID-19 era. We should be prepared to provide timely access to PPCI, particularly in communities with a very low prevalence of COVID-19.

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## Conflicts of Interest

There are no conflicts of interest to disclose.

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