



Staying home but not out of trouble: no reduction in presentations to the South Australian paediatric major trauma service despite the COVID-19 pandemic

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The COVID-19 pandemic has led countries and jurisdictions to restrict activities and interactions in order to minimize virus spread and conserve medical resources. The effects of 'lockdown' and community restrictions on injury rates and mechanisms are now becoming apparent. New Zealand (NZ) registry data have shown a significant reduction in trauma admissions in an adult level 1 trauma centre¹ and the major paediatric trauma centre² during their period of level 4 lockdown.

In Australia, individual states and territories legislate for health emergencies, guided by the Australian Health Protection Principle Committee.³ Some variation in restrictions was seen as Federal advice was adapted to local circumstances. In the state of South Australia (SA), a State of Emergency was declared on 22nd March 2020 and a Non-Essential Business (and other Gatherings) Closure Direction delivered on 23rd March with further restrictions added on 31st March.⁴ Indoor sporting activities and contact sports were ceased. Outdoor playgrounds were closed at the discretion of local councils. Regional travel was restricted and the state borders were closed to non-essential transit, with quarantine or self-isolation required for people arriving in SA. Apart from an additional four pupil free days implemented by the Department of Education ahead of the April school holidays, the majority of schools remained open, including out of school hours care and childcare.⁵ COVID-19-related activity restrictions in SA were therefore less restrictive than many other regions. The Federal Government released a Three-Step Framework, easing some COVID-19-related restrictions from 11th May. Playgrounds were generally re-opened on this date.

The Women's and Children's Hospital is the designated major trauma centre for children and adolescents <16 years of age for South Australia, western New South Wales and north-western Victoria. All patients meeting criteria for activation of a level 1 or 2 trauma call (Appendix), approximately 700–800 patients annually, are entered into a database (since 2018: Collector[®], Digital Innovation, Forest Hill, MD, USA, prior to 2018: Microsoft Access). In order to understand the effects on trauma during the COVID-19 pandemic period in a jurisdiction without a strict 'lockdown', following Human Research Ethics Committee approval, we reviewed our trauma database for presentations from 00:00 h on 23rd March 2020 until 23:59 h on 10th May 2020, corresponding with the period of greatest community restrictions. The following

data were extracted: place of injury, mechanism of injury, mode of hospital transport, level 1 versus level 2 trauma, intensive care unit (ICU) or high-dependency unit admission. For data fields with consistency across the two databases, 2020 data were compared with trauma presentations during the same date range (23rd March to 10th May) within the years 2014–2019, selecting 2014 to ensure consistency of Trauma Team Activation Criteria.

There was no change in patient numbers meeting trauma call criteria presenting to our hospital during the period of interest in 2020 (91 patients, nine level 1) compared with the corresponding time frame in 2014–2019 (median 84 patients, range 64–100, Chi-squared analysis $P = 0.6$). Similar to international data,² we saw an increased proportion of injuries occurring at home (42.8% in 2020 versus median 18.4%, range 14.1–25% in 2014–2019, Chi-squared analysis $P < 0.002$).

During the pandemic time period in 2020, three paediatric trauma patients required ICU admission, and one required high-dependency unit admission. Nine patients were retrieved by either the Royal Flying Doctor Service or South Australian Ambulance Service MedSTAR helicopter and 44 required road ambulance transport. This represents a strain on resources that must be considered during a pandemic where ICU beds and ambulance services may be at a premium.

Differences in mechanism and place of injury during the pandemic can provide targets for injury prevention strategies. The study period coincided with the Easter school holidays. Families who would normally travel have stayed home this year and sought out activities closer to home. Paediatric quad bike trauma has been an area of major concern for the Royal Australasian College of Surgeons.⁶ We admitted a cluster of four quad bike trauma cases during our 7-week lockdown period, all injured on domestic properties. This compares with one recreational case each in the corresponding time periods of 2019 and 2018 and an annual median incidence of 7.5 per year 2014–2019. Motorbike injuries also occurred, involving 13 children and adolescents during the lockdown in 2020. In contrast to NZ, where no child or adolescent motor vehicle occupants were significantly injured during their lockdown,² we treated eight occupants from motor vehicle accidents. Trampolining and bicycle riding have increased around the world during the pandemic.^{1,7} The majority of these injuries do not

meet our criteria for database inclusion and therefore we cannot comment on rates in our setting. However, previous research from our department identified that the majority of trampoline injuries are preventable with appropriate safety measures.⁸ These activities could be targeted with appropriate educational messages in the media, schools and other locations.

In 2020, four major trauma presentations resulted from inflicted injuries (assault or non-accidental injury) compared with two cases in 2018 and none in 2019. There were two cases of self-harm in 2020 compared with one each in 2018 and 2019. It is important to consider that not only are children at increased risk of inflicted injuries and depression during periods of lockdown, general societal unease and economic hardship, but the signs may go undetected during times of reduced school and extra-curricular activity attendance and increased reliance on telehealth and 'virtual' appointments.⁹ The true burden of inflicted injuries during the pandemic may be underestimated.

SA did not see a reduction in levels 1 and 2 trauma presentations at the paediatric major trauma centre in 2020 during the COVID-19 pandemic during a legislated period of restriction in sporting activities, gatherings and travel when compared with the same time period 2014–2019. As this is in stark contrast to NZ data, health services must consider their own circumstances when resource planning for the current and future pandemics. It is possible that a stricter lockdown would lead to a decrease in trauma presentations; however, the large number of significant injuries that occurred at home or in the local environment, including quad and motor bike injuries, suggests that education and public health initiatives may be vitally important to prevent serious injury and conserve medical resources during future pandemics.

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Supporting information

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix S1. South Australian Trauma System: Paediatric Trauma Call Activation Criteria.