MACH
Melbourne Academic
Centre for Health

Changing patterns in health services use and effects of care forgone: The indirect impacts of COVID-19 pandemic restrictions on Victorians' healthcare.

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The *Changing patterns in health services use and effects of care forgone: The indirect impacts of COVID-19 pandemic restrictions on Victorians' healthcare* project has been completed in collaboration with the Health Services Improvement and Implementation Committee, MACH and the Health Services Research Unit, The Royal Children's Hospital.

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Acknowledgement of Country

Members of the Melbourne Academic Centre for Health would like to knowledge and pay respect to the Traditional Owners of the land on which we work, and pay our respects to Elders, past, present, and emerging.

Contents

Executive Summary

In 2020, coronavirus (COVID-19) pandemic restrictions were associated with varying changes in Victorian emergency department (ED) presentations and hospitalisations for paediatric (0-17 years), adult (18-64 years, including maternity) and older adult (≥ 65 years) health conditions. Overall, changes were greater in metropolitan Melbourne than regional Victoria and appeared to be inequitable. For the most part, where there were increases in presentations, these were greater for patients living in low socio-economic status (SES) areas than those living in higher SES areas. There were some notable exceptions, e.g., eating disorders where patients living in middle class areas were more likely to present to EDs. Females also appeared to be at greater risk of presentations, particularly for mental health conditions in the latter stages of lockdown.

Some changes were predictable – e.g., a reduction in viral infections given the widespread use of hand washing and social distancing and reductions in motor vehicle accidents and pedestrian injuries given the restrictions on movement.

However, other changes were less predictable and present cause for concern and action. These include *increased* rates of ED presentations for eating disorders and self-harm, and infant feeding difficulties and irritability. They also include unexpected *decreased* rates of ED presentations and admissions, possibly reflecting a delay in accessing healthcare e.g., a decline in presentations for retinal detachments. Similarly, the decline in paediatric and adult presentations due to neglect, maltreatment or assault may reflect a delay in accessing appropriate community-based care. Finally, where we may have expected an increase in hospital presentations due to a lack of healthcare in the community, we in fact saw *no change*. For example, dental presentations for children (especially low SES children) did not change even though dentists stopped treating all but urgent cases during 2020 lockdowns.

Below we summarise the changes in presentations by condition. The remainder of this report details the changes across paediatric, adult, and older adult conditions by patient residence, SES, and sex. We then make policy recommendations to ensure all Victorians continue to get the healthcare they need during this and any subsequent pandemic.

Conditions with an increase in presentations

Paediatric: infant feeding difficulties and irritability; eating disorders; self-harm; anxiety; mood disorders.

Adult: cycling injuries; foreign bodies in eyes; eating disorders; self-harm; anxiety; personality disorders; substance abuse.

Older adult: Covid-19 and respiratory illness in Residential In-Reach (RIR) care only (not EDs).

Conditions with a decrease in presentations

Paediatric: ambulatory care sensitive conditions (e.g., asthma, epilepsy); gastroenteritis; viral infections; injuries; neglect or maltreatment or assault.

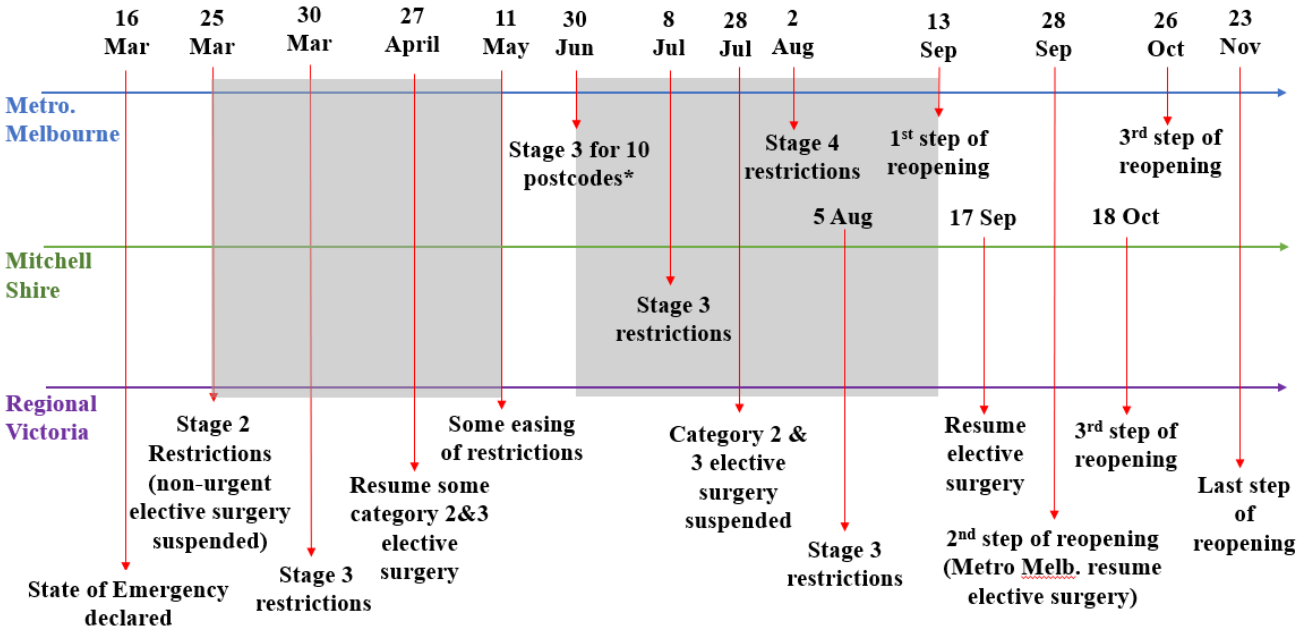
Adult: ambulatory care sensitive conditions (e.g., asthma, chronic obstructive pulmonary disease); early pregnancy and postpartum conditions, especially miscarriage or threatened miscarriage; motor vehicle and pedestrian injuries; retinal detachment.

Older adult: falls and injuries; dementia and delirium; nutrition and dehydration.

Background

The COVID-19 pandemic has seen a "transformative shock" to our healthcare system since the first case was reported in January 2020.[1] Figure 1 and Figure 2 show the timeline of Victoria's lockdowns and associated restrictions in 2020. In mid-March, a state of emergency was declared followed by Stage 3 lockdown restrictions introduced at the end of that month.[2] The lockdown restrictions meant there were closures to many workplaces and only four reasons to leave home: essential shopping, medical care and caregiving, and work or education that could not be done at home.[2] Restrictions were partially lifted in mid-May however, by late June 2020, cases of COVID-19 were increasing again. A large second wave of infections led to a 112-day lockdown for those living in Melbourne, with additional restrictions of a curfew and a 5-kilometre radius travel limit.[3,4] The second lockdown was considerably longer than any lockdown experienced by other Australian states.

Figure 1. Timeline of Victorian COVID-19 pandemic restrictions in 2020



* The 10 postcodes are: 3012, 3021, 3032, 3038, 3042, 3046, 3047, 3055, 3060, 3064

Figure 2. Restrictions for each stage of lockdown in 2020

	Gatherings of people & Reasons to leave home	Workplaces	Schools	Sporting activities
Stage 2	• Public & outdoor gatherings can be held with a maximum of 20 people • Private gatherings at home can have up to 20 people, including household members • Stay at home where they could	• Work from home where possible, stay home if unwell.	• Schools stay open under this stage of restriction • School term end early	• Up to 20 people allowed outdoors • Non-contact activity spaced 1.5m apart
Stage 3	• Public gathering up to 2 people or household members only • Private: no visitors • Stay at home except for 4 reasons: necessary goods, medical care, exercise, work & education if necessary • Cannot enter metropolitan Melbourne for exercise or recreation	• Must not allow employees to work from workplace if reasonable practicable to work from home	• Remote learning state-wide, including Year 11 & 12s • Specialist schools remain open for all children • Childcare & kinder remain open for all children	• Community & indoor sports closed • Outdoor sports with 1 other person limited to activities that 1.5m distance can be maintained
Stage 4	• A curfew from 8pm to 5am • Shopping limited to 1 person per household per day & no more than 5km from home		• Study at TAFE & university must be done remotely • Schools return to remote & flexible learning across all year levels • Same rules apply to kinder & childcare services	• Exercise limited to a maximum of 1 hour per day & no more than 5km from home • Exercise group size limited to a maximum of 2

Many patients stayed away from health services with fewer presentations to EDs and fewer hospital admissions. Whilst in many cases this may represent a reduction in both avoidable presentations and a reduction in communicable conditions such as respiratory and gastrointestinal infections, there are concerns that necessary care has also been impacted.

Visits to primary care providers also declined, including to general practitioners (GPs). Most GPs visits moved to telehealth (TH), reducing the ability to examine patients or offer preventive care or check-ups, especially for those with a pre-existing chronic illness or ambulatory care sensitive condition (ACSC). Changes to maternity care were widespread and continue, including a reduction in the frequency of in-person antenatal visits, widespread use

of TH consultations, cancellation of in-person antenatal classes, visitor limits to family and support persons, and encouragement of early postnatal discharge.

With social restrictions and the associated economic implications, many are suffering increasing mental health symptoms and stress, with increasing calls to mental health support lines.

For infants and their mothers, especially first-time mothers, most Maternal and Child Health Nurses (MCHN) moved to providing care via telephone consults, reducing the ability to provide breast feeding support and physically examine and weigh infants who are at risk of poor weight gain and conditions such as jaundice. Disruption to MCHN services had a considerable early impact on admission of infants < 3 months to hospital for poor weight gain and for maternal coping and depression.[5]

Dentists were also precluded from practising in all but emergency cases, due to concerns about aerosolising procedures and spreading the virus. Optometrists and GP visits for eye care decreased, increasing the risk of blindness and serious complications from potentially treatable conditions. In the context of primary eyecare, Medicare data demonstrate a 31% reduction in optometry services in Victoria between March-October 2020, relative to March-October 2019.[6]

In the residential aged care sector, COVID-19 preparations saw sweeping changes to general practice and family access to residential aged care facilities (RACFs). Fear of COVID-19 led to reluctance to send residents to hospital and change to referrals to other visiting specialists (e.g., geriatricians and aged psychiatry services). Some Residential In-Reach services (RIR) observed an increase in referrals during this time whereas others had reduced activity. Many noted increased acuity or severity of presentations at referrals.

So, what has been the impact of this transformative shock on Victorians and their use of healthcare services? Has equity of access been enhanced, maintained, or diminished during this crisis? Have there been unintended consequences of the changes in how healthcare is delivered?

This report details changes in ED presentations and hospital admissions for several key paediatric and adult conditions and makes policy recommendations for each. We examined data from 2018-2020, accounting for seasonal and pre-existing trends in our interpretations.

Methodology

Data Sources

We used ED presentation data obtained from the Victorian Emergency Minimum Dataset (VEMD), hospital admission data obtained from the Victorian Admitted Episode Dataset (VAED) and data on RACF residents the Victorian Integrated Non-Admitted Health (VINAH) dataset. We analysed data from January 1, 2018, to October 31, 2020.

The VEMD data comprises de-identified demographic, administrative and clinical data which is mandatorily collected from all 39 Victorian public hospitals with a designated ED.[7] Each presentation has a single principal diagnosis recorded by an ED clinician using the International Statistical Classification of Diseases and Related Health Problems, Tenth Revision, Australian Modification (ICD-10-AM) codes.

The VAED data comprises de-identified demographic, administrative and clinical data which is mandatorily collected from all 147 Victorian public and private hospitals.[8] Each admission has a single principal diagnosis recorded using ICD-10-AM codes.

Conditions of interest were extracted from VEMD and VAED based on the principal diagnosis of pre-defined ICD-10-AM codes.

The VINAH data collection integrates patient-level data across various government-funded programs.[9] Residential In-Reach (RIR) program is one of the programs recorded in VINAH. RIR services provide assessment and management of RACF residents with an acute medical condition in appropriate and safe circumstances, to reduce unnecessary ED presentations and hospital admissions. A RIR episode is opened when a health services provider responds to a referral and accepts responsibility for a client.

Analyses

To examine the change in health service use before and after the COVID-19 pandemic restrictions, the number of ED presentations (VEMD) and hospital admissions (VAED) of conditions of interest, and number of in-reach episodes (VINAH) were converted into a monthly time series format and the entire observational period was divided into a pre-COVID-19 period and a COVID-19 period. The COVID-19 period was defined from March 31, 2020 (start of stage 3 lockdown in Victoria) to October 28, 2020 (end of the lockdown). Thus, the study period comprised 27 “pre-COVID-19” and 7 “COVID-19” months of observations; overall, 34 observation points. **For relevant figures, the grey section denotes the periods of COVID-19 movement restrictions in Victoria, with the dark grey sections indicating the periods of stage 3 and 4 restrictions in metropolitan areas.**

For VEMD and VAED, we examined changes during the COVID-19 period in health service use for each condition by:

- patient sex;
- patient SES using the Australian Bureau of Statistics' (ABS) Socio-economic Indexes for Areas (SEIFA) - Index of Relative Socio-economic Disadvantage (IRSD), with lower quintiles representing lower socio-economic status;[10]
- patient regional area based on the ABS's Remoteness Areas Structure, with major cities designated as metropolitan Melbourne and all other (inner regional, outer regional, remote, and very remote) area variables designated regional Victoria;
- ED presentation severity based on the Australasian Triage Scale, where 1 = most urgent, must be seen immediately to 5 =least urgent, safe to wait up to 2 hours, based on acuity;[11]
- ED disposition;
- inpatient length of stay; and
- intensive care unit (ICU) admissions proportion.

For VINAH, we examined pattern changes in In-reach activities and compared with that of ED presentations and hospital admissions for RACF residents during COVID-19 period by:

- RACF resident regional area based on the ABS's Remoteness Areas Structure, with major cities designated metropolitan Melbourne and all other (inner regional, outer regional, remote, and very remote) area variables designated regional Victoria; and
- COVID-19-relatedness; COVID-19-related episodes were separated from the rest using the Independent Hospital Pricing Authority published rules for coding and reporting COVID-19 episodes of care.[12]

Detailed Findings

Child Health

Ambulatory Care Sensitive Conditions

Ambulatory care sensitive conditions (ACSCs) are a defined group of conditions where adequate and timely primary care may lead to avoidance of hospitalisation.[13]

Relevant ACSCs for Victorian children include:

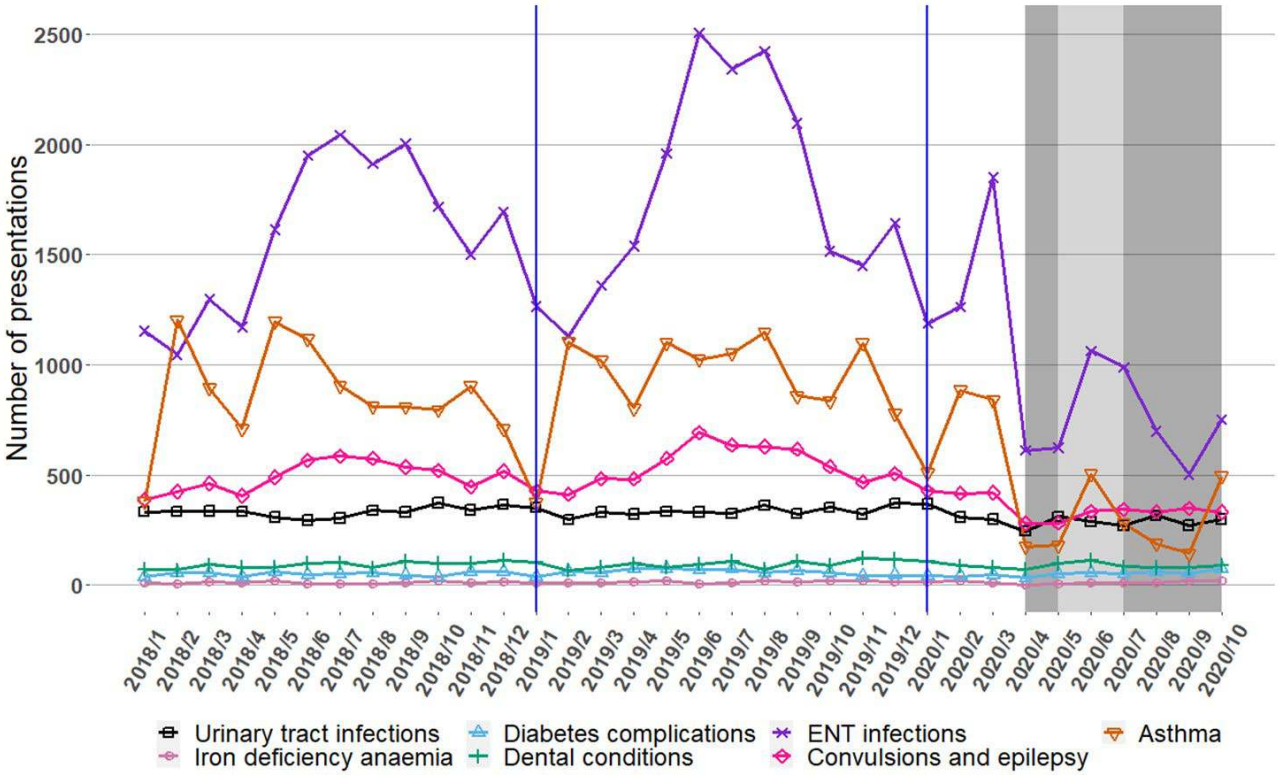
- urinary tract infection;
- iron deficiency anaemia;
- diabetes complications;
- dental conditions;
- ear, nose and throat (ENT) infections;
- convulsions and epilepsy; and
- asthma.

Cellulitis and vaccine-preventable conditions are also included within a traditional definition of ACSCs, however, are not included here due to an inability to link procedure codes for cellulitis relating to ED visits, and difficulty obtaining data from the Australian Immunisation Register that would show vaccination rates throughout 2020.

There were 41,319 ACSC presentations in 2018, 44,978 in 2019 and 21,807 in 2020 (January - October only). Overall, 47.6% of presentations were by girls, with a median age of 3 years.

There was a marked reduction in ED presentations and hospital admissions for all ACSCs (Figure 3).

Figure 3. Trends in ED presentations for ACSCs in children and adolescents



Note. The grey section denotes the periods of COVID-19 movement restrictions in Victoria, with the dark grey sections indicating the periods of stage 3 and 4 restrictions in metropolitan areas.

This reduction was consistent across age groups, and more marked in metropolitan than regional areas. There was a small "rebound" increase in ENT infections and asthma between the first and second lockdown periods in 2020. There was a greater reduction in visits by those from lower SES areas, and for those with less urgent triage categories.

Policy and practice implications

- Public health messaging should emphasise handwashing in winter months as a potentially useful tool for reducing the spread of viral illness. Viral exacerbations of asthma, and ear, nose and throat infections were significantly reduced during the lockdown period, however, rebounded quickly between Victoria's first and second wave. As these presentations are driven by common childhood viral illnesses, it is to be expected that further spikes in ED visits will occur as restrictions are eased.
- Dental health checks in schools should be a public health priority, with greater focus on low SES children.[14] There was no observed increase in dental presentations, which is of concern considering dentists largely closed appointments for regular check-ups. It would be expected that dental illness was still developing but has not been detected.

- There was minimal observed difference for urinary tract infections, diabetes complications, and iron deficiency or anaemia, which is expected as these ACSCs are unaffected by viral illness.

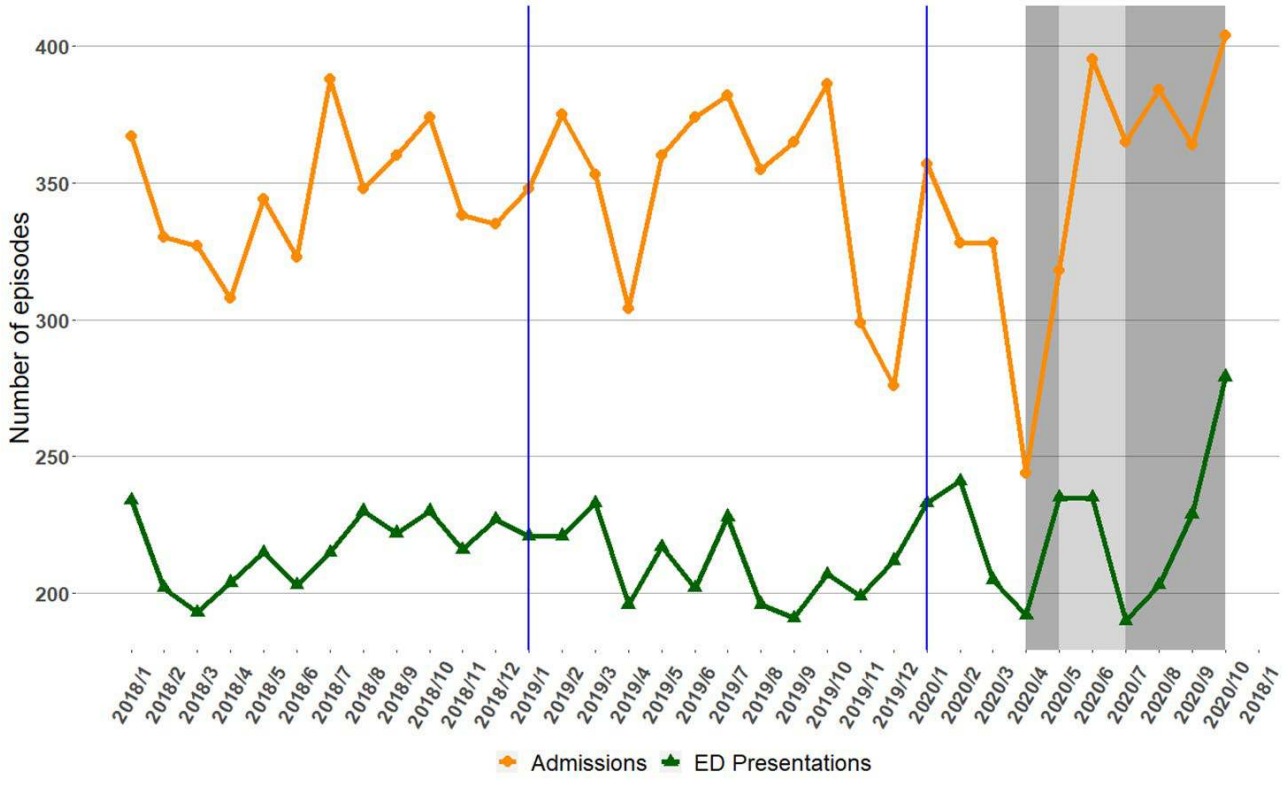
Infant Health

To assess the impact of COVID-19 on infant health (children under 6 months of age) we looked at three categories of presentations: feeding difficulty and irritability; viral infections and gastroenteritis; and urinary tract infection. We examined trends for both ED presentations and hospital admissions.

For feeding difficulties and irritability, there were 2591 ED presentations in 2018, 2523 in 2019 and 2242 in 2020 (January-October). For the similar conditions, 4142 patients were admitted in 2018, 4177 in 2019 and 3487 in 2020 (January-October).

Increases for feeding difficulties and irritability occurred most markedly in the second lockdown for ED presentations, and both lockdowns for admissions (Figure 4). Metro Melbourne was the driving force behind these changes, with stable ED presentations and admissions in regional Victoria. Lower SES groups were overrepresented. There was no change in the length of stay (LOS) or proportion of ICU admissions for feeding difficulties and irritability.

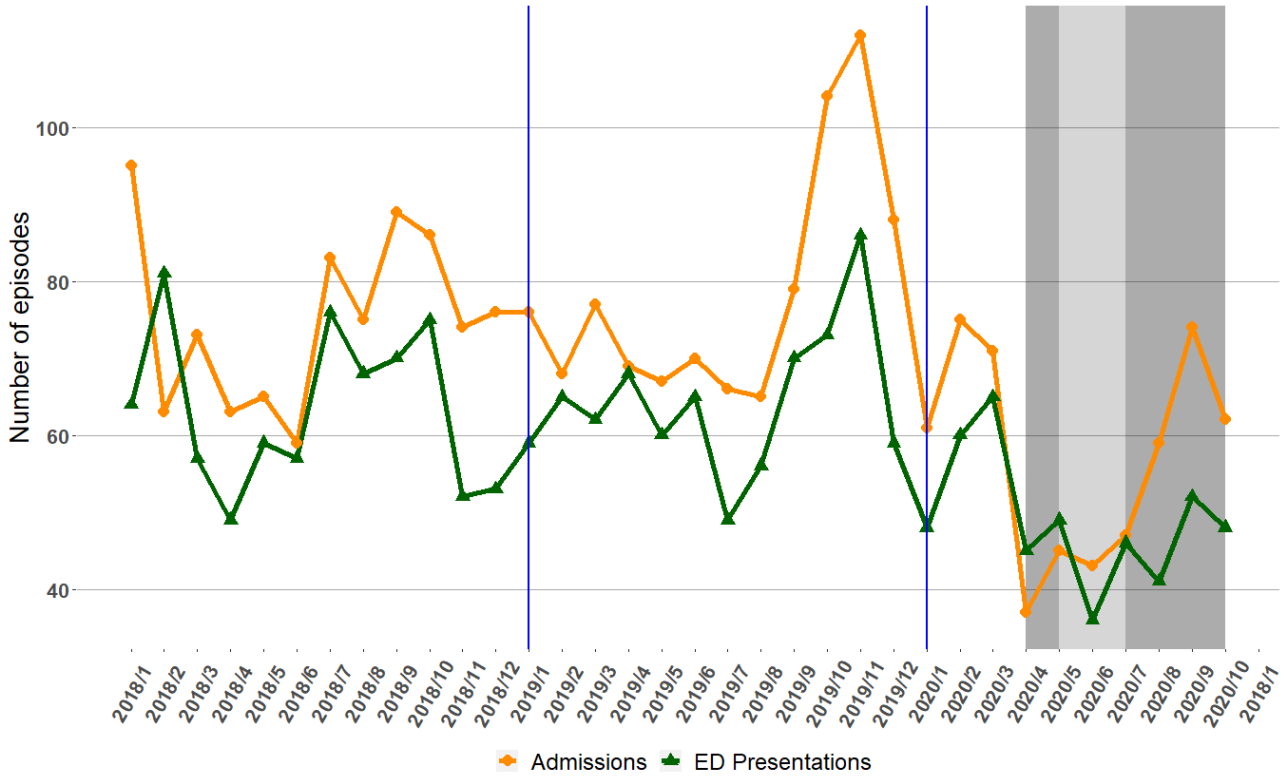
Figure 4. Trends in hospital admissions and ED presentations for irritability and feeding difficulties in infants



For infant infections, there were 761 ED presentations in 2018, 772 in 2019 and 490 in 2020 (Jan-Oct). For the similar conditions, 901 patients were admitted in 2018, 941 in 2019 and 574 in 2020 (Jan-Oct).

For infant infections there was a precipitous reduction in both ED presentations and hospital admissions during both lockdowns (Figure 5). Reductions in these infections were observed equally in metro and regional areas, and across all socio-economic groups.

Figure 5. Trends in hospital admissions and ED presentations for infant infections



Policy and practice implications

- Clear increases in presentations and admissions for infant irritability and feeding issues may represent changes in access to usual supports and poor availability of alternate community-based supports over the lockdown periods for new mothers. Maternal and Child Health services changed to telephone or telehealth services, with loss of in-person support, and home visits from family members were restricted.[15] This should inform future pandemic planning and policy development to ensure healthcare resources are directed to the most vulnerable populations including new parents and their infants.
- Infectious conditions that are easily transmissible unsurprisingly decrease during lockdown periods with strict public health measures; the rebound effect once lockdown measures end is also predictable and needs to be anticipated. Large

numbers of paediatric ED presentations and hospital admissions for viral infections should be planned for as restrictions ease.

- Other infections conditions that are reliant on individual patient factors and are not transmissible (such as urinary tract infections) are unaffected by lockdown measures. Safe hospital-based care for these conditions needs to continue to be available during lockdowns, and during any future periods of increased COVID-19 transmission in the community.

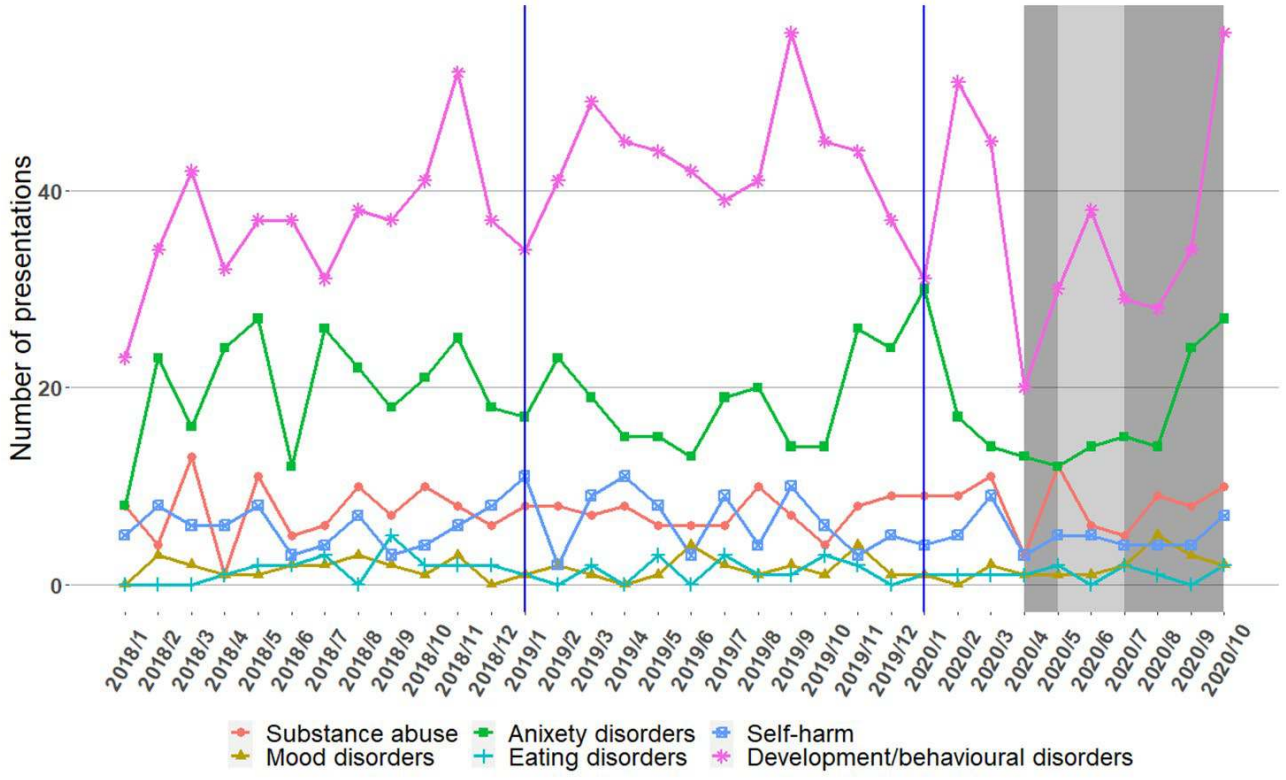
Mental Health

There were 6724 mental health presentations in 2018, 7340 in 2019 and 6605 in 2020 (January-October only). Overall, 66% of presentations were by girls with a mean age 14.3 (SD 3.0) years.

Except for eating disorders, the proportion with an urgent triage category tended to increase over time, whilst the proportion of children admitted largely remained stable. Children living in lower SES areas were more likely to present for mental health conditions than children living in higher SES areas, except for eating disorders where the reverse trend was found. Most presentations were by children living in metropolitan areas with little change over time, except for an increase in metropolitan children presenting with eating disorders in 2020.

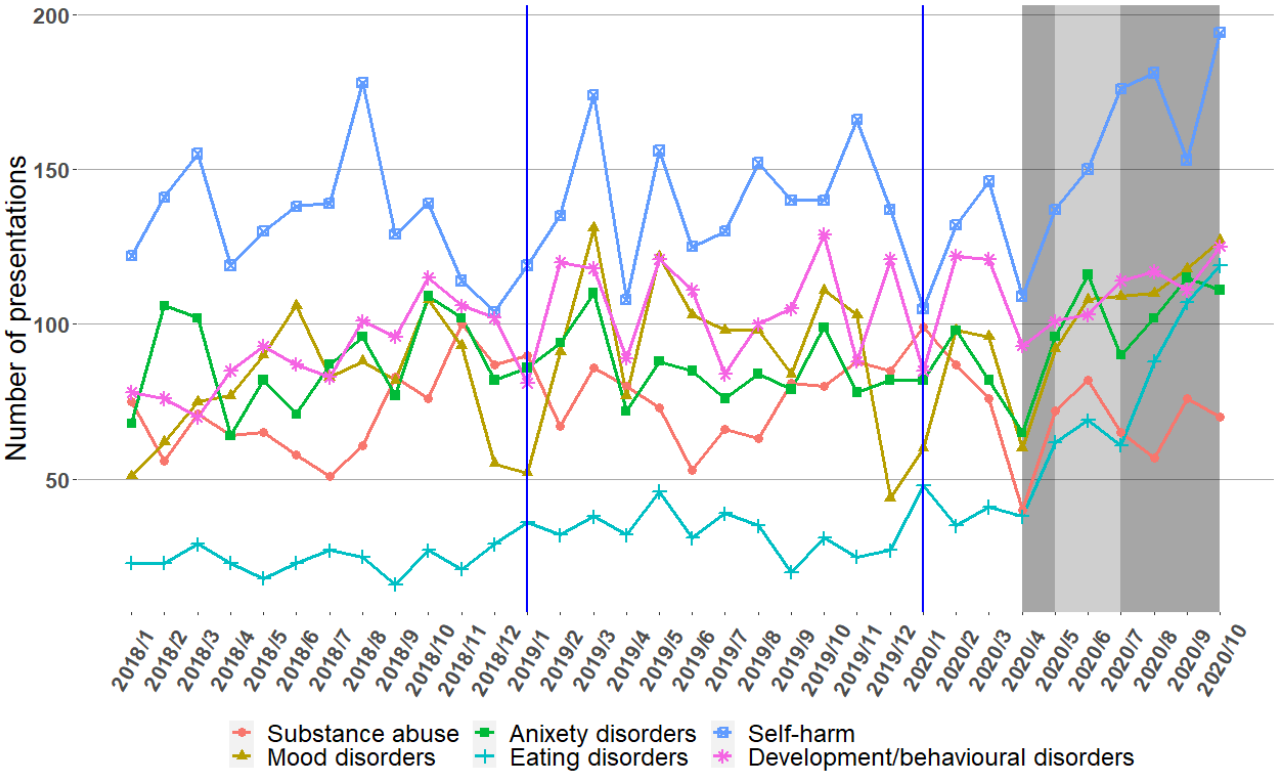
For younger children (age <12 years), there were rises in presentations for anxiety and development or behavioural disorders (autism and attention deficit disorder; Figure 6).

Figure 6. Trends in ED presentations for mental health conditions in children age <12 years



For children aged 12 to <18 years, presentations rose sharply for eating disorders, anxiety disorders, mood disorders, and self-harm (Figure 7).

Figure 7. Trends in ED presentations for mental health conditions in children age 12 to <18 years



Policy and practice implications

- Greater support and services for child mental health is required as this pandemic continues, if we are to curb mental health presentations to EDs, especially for eating disorders.
- A focus on early prevention and intervention is paramount, e.g., by increasing funding and professional upskilling to frontline clinicians who care for mental health in Australian children - principally GPs, psychologists, and paediatricians.
- The Royal Children's Hospital (RCH) and the North Western Melbourne Primary Health Network piloted a Community of Practice to upskill 59 such clinicians in March-July 2021. Through case discussions and secondary consultations with a child and adolescent psychiatrist, clinicians report improved confidence in the non-pharmacological and pharmacological management of common mental health conditions such as anxiety, depression, and self-harm (see: https://nwmphn.org.au/commissioned_act/child-mental-health-community-of-practice-pilot/). Referrals to RCH Child and Adolescent Mental Health Services decreased during this time.

- More complex and severe mental health problems such as eating disorders and self-harm require specialist mental health support. Wrap-around services in the community could curb subsequent presentations.

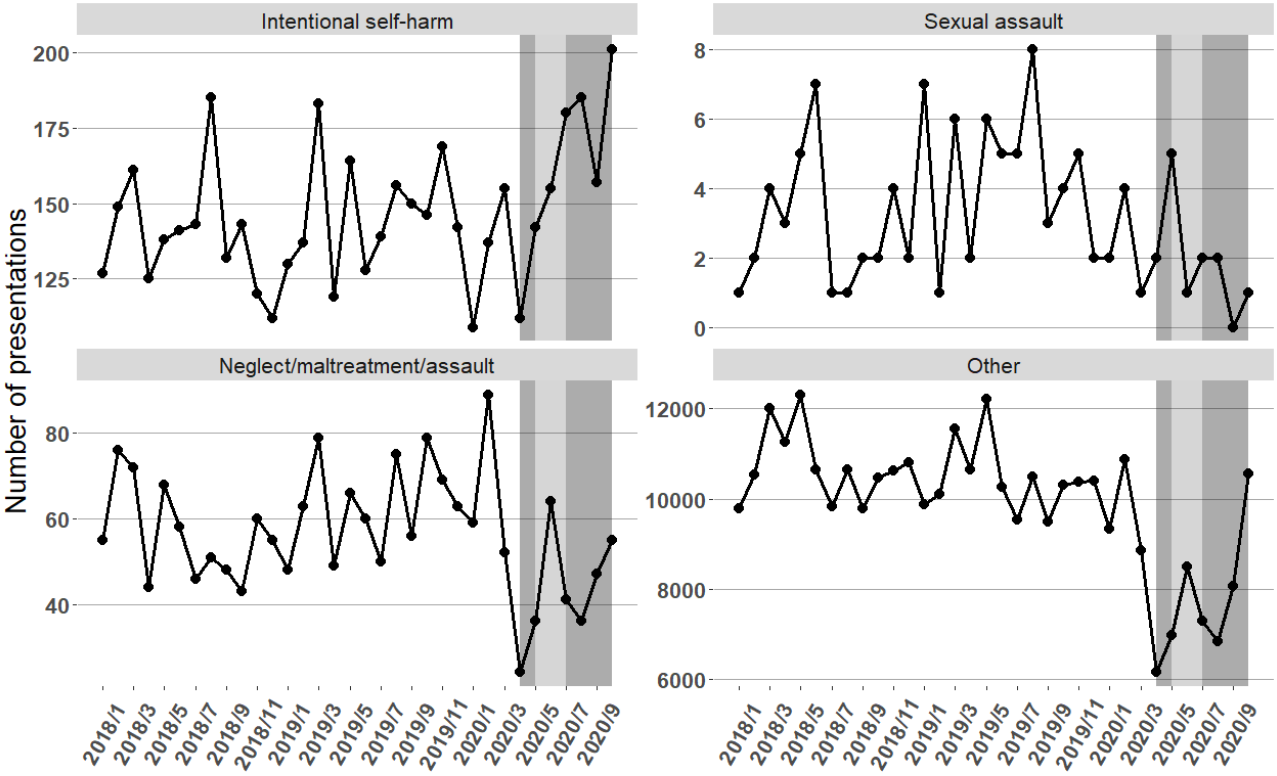
Injuries

There were 131,100 ED presentations with injury in 2018, 127,837 in 2019 and 85,485 in 2020 (January-October only). Overall, 58% of presentations were by boys with a mean age of 8.3 (SD 5.2) years. People from lower SES areas were more likely to present to ED with injuries than people from higher SES areas.

Except for self-harm, there was a large reduction in children and adolescents presenting to the ED with injuries during COVID-19, mostly driven by a reduction in non-urgent presentations. This reduction was greater in metropolitan Melbourne than in rural or regional areas.

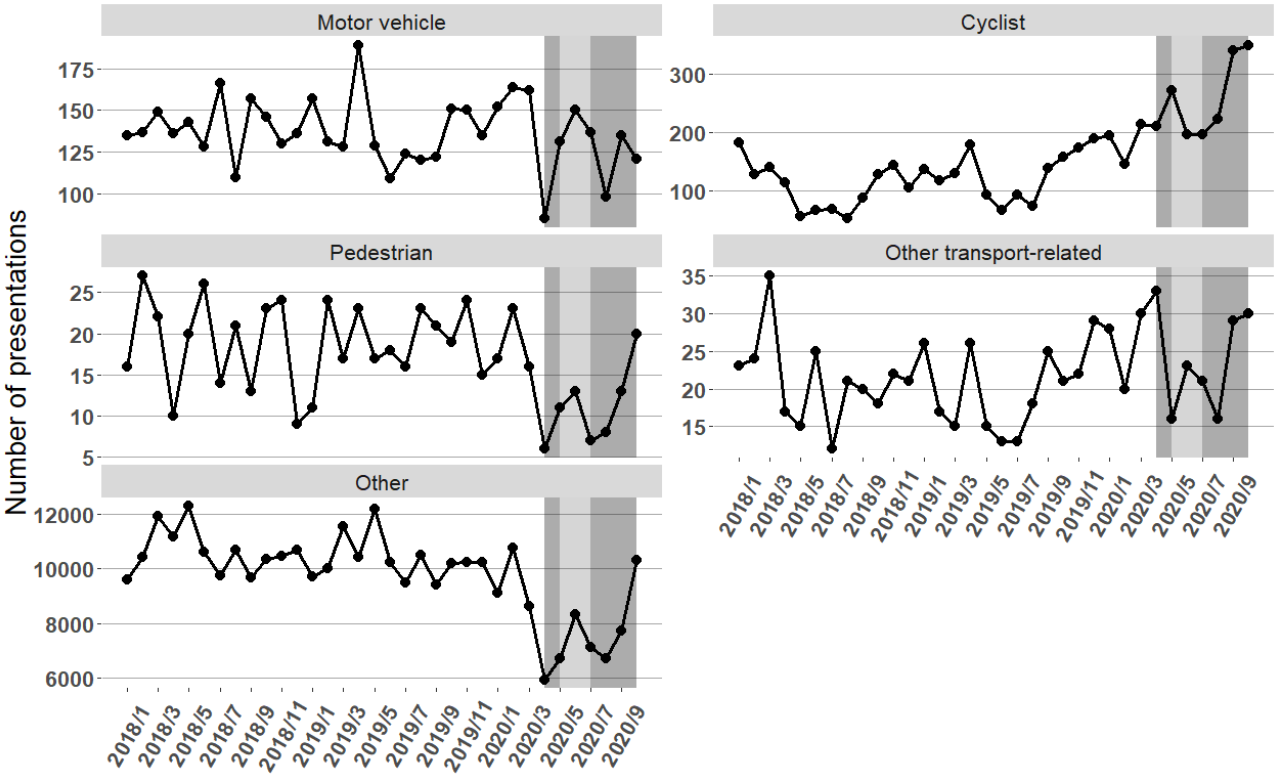
ED presentations for intentional self-harm increased, while the number of presentations related to neglect, maltreatment and assault decreased in both children (Figure 8). This decrease was due to a reduction in assault by "other or unknown" assailants. There was no significant change noted in assault by a current or former intimate partner or by other family members.

Figure 8. Trends in ED presentations grouped by injury type in children and adolescents



ED presentations for cyclist related injuries increased, while the number of motor vehicle and pedestrian-related injuries dropped (Figure 9).

Figure 9. Trends in ED presentations grouped by injury cause in children and adolescents



Policy and practice implications

- It is likely that increased bicycle accidents were related to limited opportunities to pursue other recreational activities due to COVID-19 restrictions, and increased uptake of cycling. Safety messages reinforcing helmet use and supervision for novice riders may reduce these injuries.
- The increase in intentional self-harm highlights the importance of addressing mental health issues (discussed above).
- The lack of change in assault by a current or former intimate partner or by other family members may reflect competing forces at work – for example, the 5km rule and night curfews may act as a 'break' on assaults by former intimate partners (which make up a lot of the violent assaults and homicides). Alternatively, the stay-at-home orders may mean that some violent behaviour towards women may be curbed by constant presence at home, where behaviour or contact with other family is constrained, hence curbing the need for controlling behaviour. Further (qualitative) research is required to understand this lack of change.

- The lack of change in presentations for child abuse is also surprising given children's interaction with mandated reporters, such as teachers and paediatricians, was more limited. This suggests that alternative mechanisms of reaching children at risk of harm may be required during repeat lockdowns. Whilst parts of Victoria Police were keeping an eye on known vulnerable children in 2020, in 2021, some services have even closed their books to new referrals as they are unable to keep up with the demand.
- A system dedicated to monitoring and responding to the demand for service regarding the sexual abuse of children and young people is therefore needed. The development of a service along the lines of Kids Helpline (or additional funding directed to Kids Helpline) that gives children and young people somewhere to make a disclosure could be considered.
- For services that are delivered online, including schooling, consideration needs to be given to how these services are provided safely for children and young people and for professionals who provide such services to be alert to possible concerns about a child or young person's safety.

Adult health

Ambulatory Care Sensitive Conditions

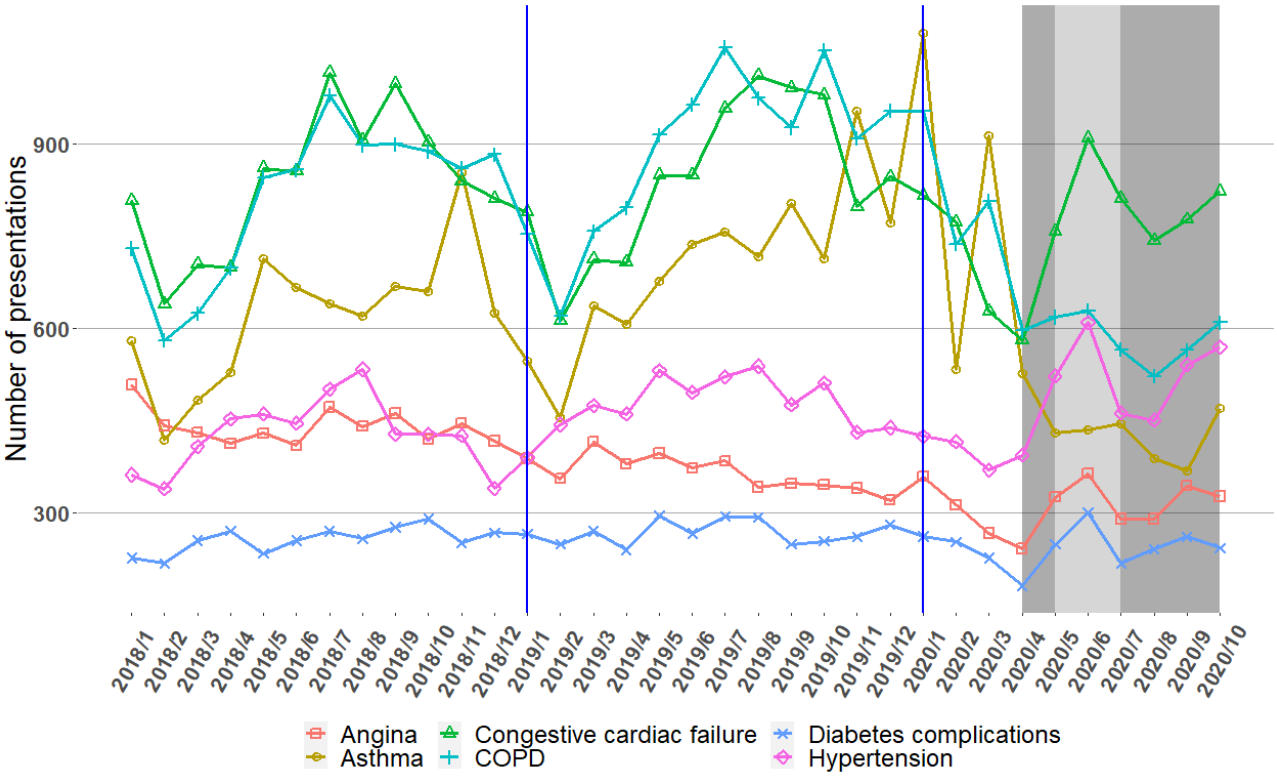
Relevant Ambulatory Care Sensitive conditions (ACSCs) for Victorian adults (≥18 years) included in the analysis for this report were:

- angina;
- congestive cardiac failure;
- hypertension;
- chronic obstructive pulmonary disease (COPD); and
- complications of diabetes mellitus.

There were 40,696 ACSC presentations in 2018, 42,451 in 2019 and 30,097 in 2020 (January-October only). Overall, 52.4% of presentations were by females with a mean age of 64.5 (SD 19.4) years.

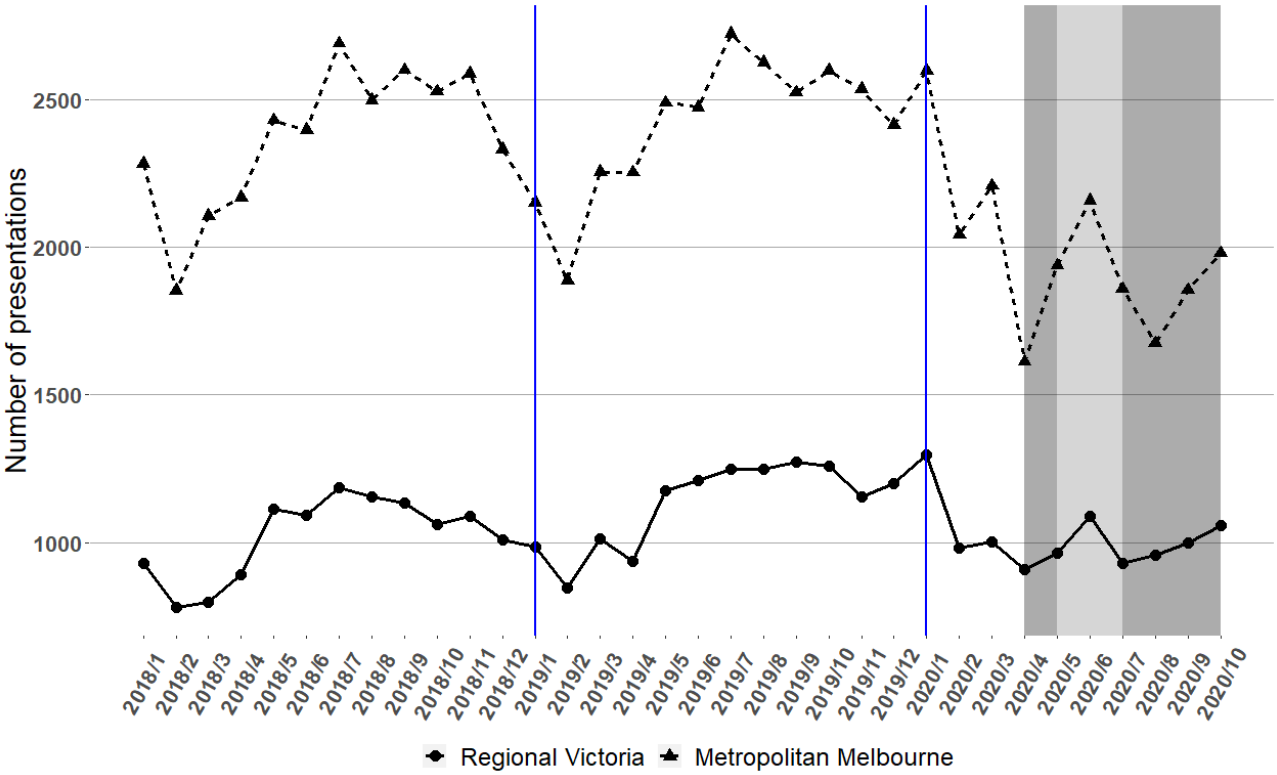
The largest decreases for ACSC presentations to ED during the COVID-19 period were observed in asthma, followed by COPD (Figure 10). The proportion of ACSC patients with an urgent triage category remained relatively stable over time. The incidence of ACSC admissions followed that of ED presentations, with a sharp reduction during the COVID-19 period for COPD and asthma.

Figure 10. Trends in ED presentations for ACSCs in adults



Metropolitan Melbourne contributed most to the large decrease in ED presentations during the COVID-19 period, whereas the number of presentations in regional Victoria remained relatively stable (Figure 11). Adults living in lower SES areas were consistently more likely to present with ACSCs than adults living in higher SES areas.

Figure 11. Trends in ED presentations grouped by rurality for ACSCs in adults



Policy and practice implications

- The cause of the observed large reduction in asthma and COPD presentations during the COVID-19 period will likely be multifactorial.
- Public health restrictions may have reduced viral exacerbations of chronic respiratory illness.
- However, it is necessary to remain vigilant to the reduction in ED presentations being a result of hospital avoidance for these patients.
- It is expected that as the pandemic progresses and restrictions ease, there will be a marked increase in the incidence of adults with asthma and COPD presenting to EDs with acute and potentially severe exacerbations of their chronic respiratory condition.
- This expected future influx of adult ASCS presentations will represent a large non-COVID-19 demand on the health system.

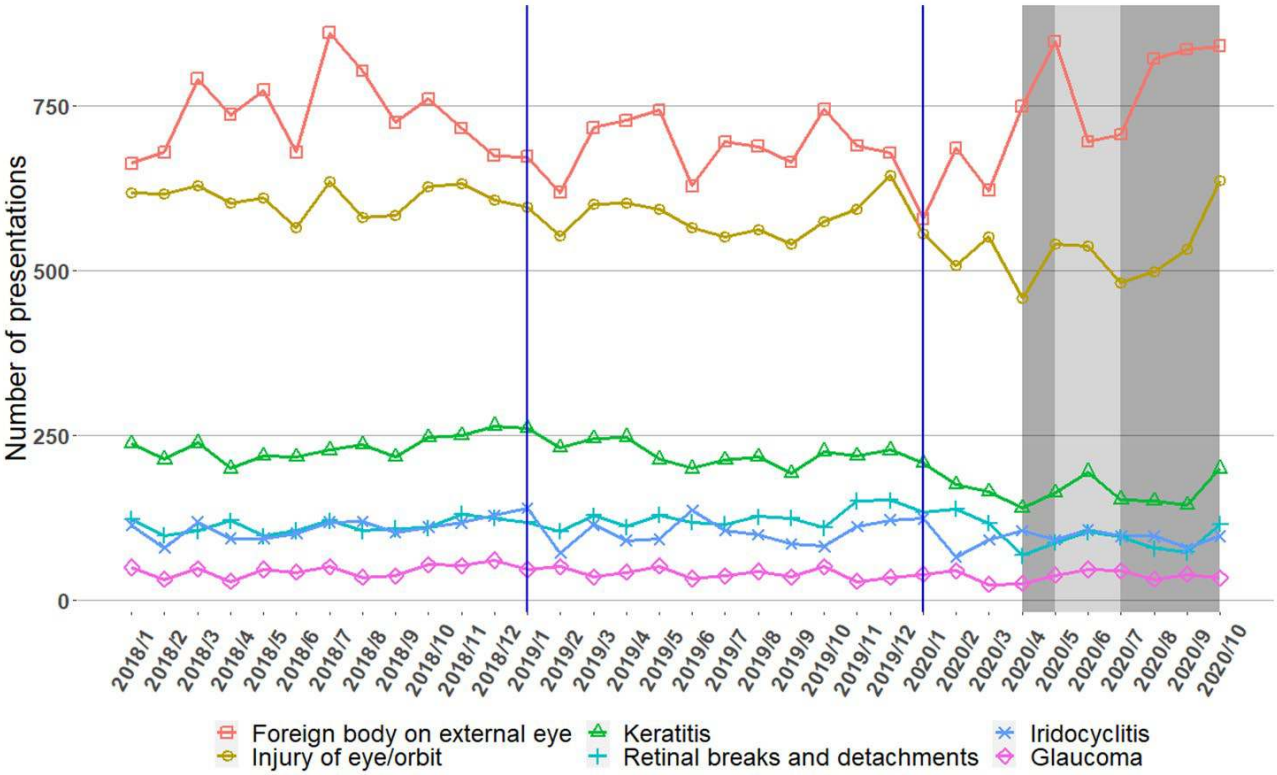
- Utilising the increase in remote (i.e., online) clinical consultations, it will be important to refresh principles of effective home-based care (e.g., asthma preventers) to mitigate this potential for a marked upsurge in ED presentations.
- Attention to vaccination (for influenza and COVID-19, including prioritising boosters when recommended) will be essential for this group.

Eye Health

There were 22151 presentations for eye health conditions in 2018, 21197 in 2019 and 16732 in 2020 (January-October only). The mean age of presentations was 40.9 (SD 19.1) years. The majority (74%) of presentations were male. 90.8% of presentations were for people aged 18 years or older. **The number of presentations was relatively stable for the adult group with a slight drop for children.** There was a decline in ED presentations in metropolitan Melbourne, whereas the number of presentations in regional Victoria remained stable.

The most apparent changes were an increase in presentations for foreign bodies and a decrease in retinal detachments (Figure 12). Presentations related to eye conditions dropped for both lower and higher SES groups, however, more people from lower SES areas presented to ED for eye conditions than people from higher SES areas. The increases in ophthalmic foreign body presentations were driven by increased attendances by men.

Figure 12. Trends in ED presentations for eye conditions for adults and children, combined



Policy and practice implications

- Ocular foreign bodies are common injuries in construction and some trades. Increased time at home during lockdown may have resulted in more injuries associated with home and garden improvement projects, as has been reported internationally.[16] Increased safety messaging reinforcing the need for eye protection is important. Reduced access to community optometry services may have pushed some foreign body presentations from primary eyecare to emergency departments.
- It is unclear whether decreases in presentations are related to reduced access and triaging within primary eyecare. The decrease in presentations for retinal detachments is in line with reports internationally and may signal delayed access to eyecare with potential future sight threatening implications.[17, 18] Public health messaging is needed to ensure people do not delay care when changes to vision are noted and are confident to safely receive eyecare.

Mental Health

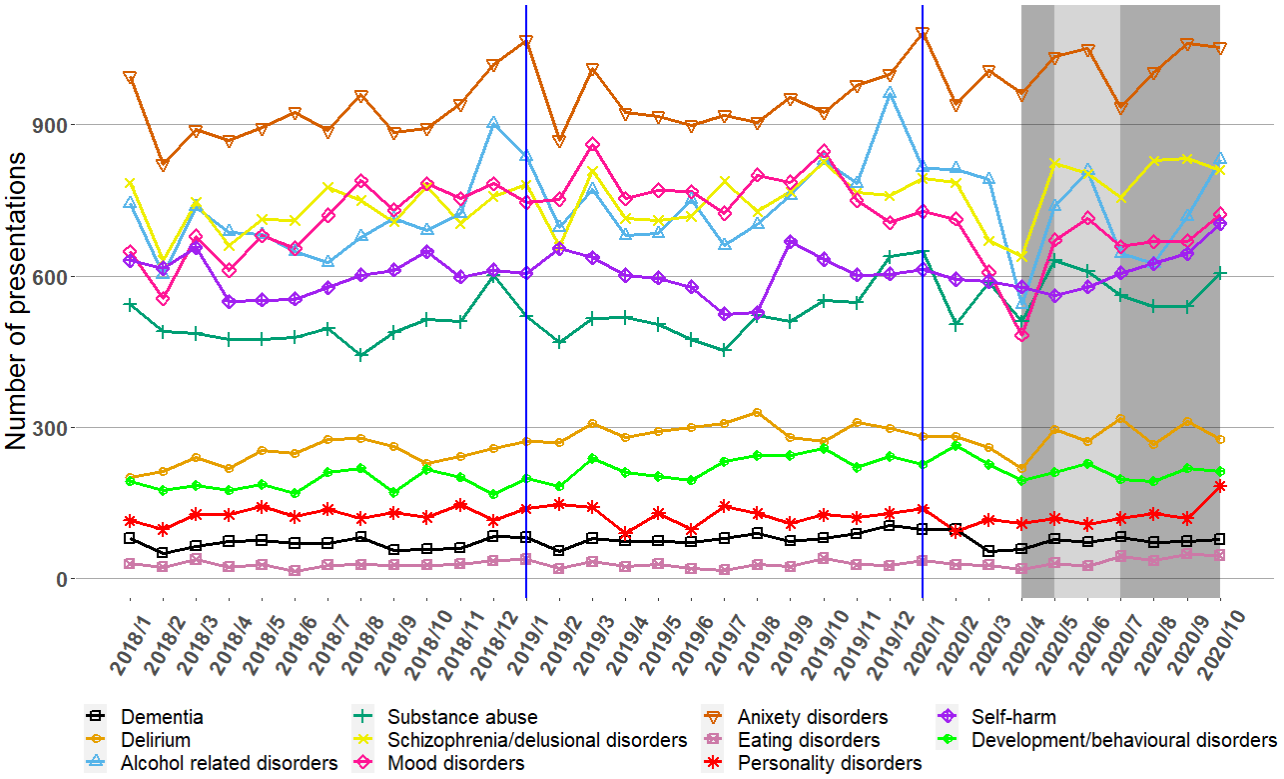
There were 57,537 adult (> 18 years) mental health presentations in 2018, 61,161 in 2019 and 50,931 in 2020 (January-October only). There was an approximately equal proportion of male and female presentations, with a mean age of 41.1 (SD 18.3) years.

There was a modest (at least a 10% decrease) reduction in ED presentations relating to dementia, delirium, alcohol-related disorders, mood disorders and developmental or behavioural disorders (Figure 13)**. There was minimal change in ED presentations relating to schizophrenia or delusional disorders.**

There was a small (approximately 5% increase) in ED presentations relating to substance abuse, anxiety, personality disorders and self-harm. There was a marked increase in eating disorder presentations. In October 2020 (the last month of available data), there was a large increase in personality disorder presentations, approximately 50% greater than that expected based on previous data.

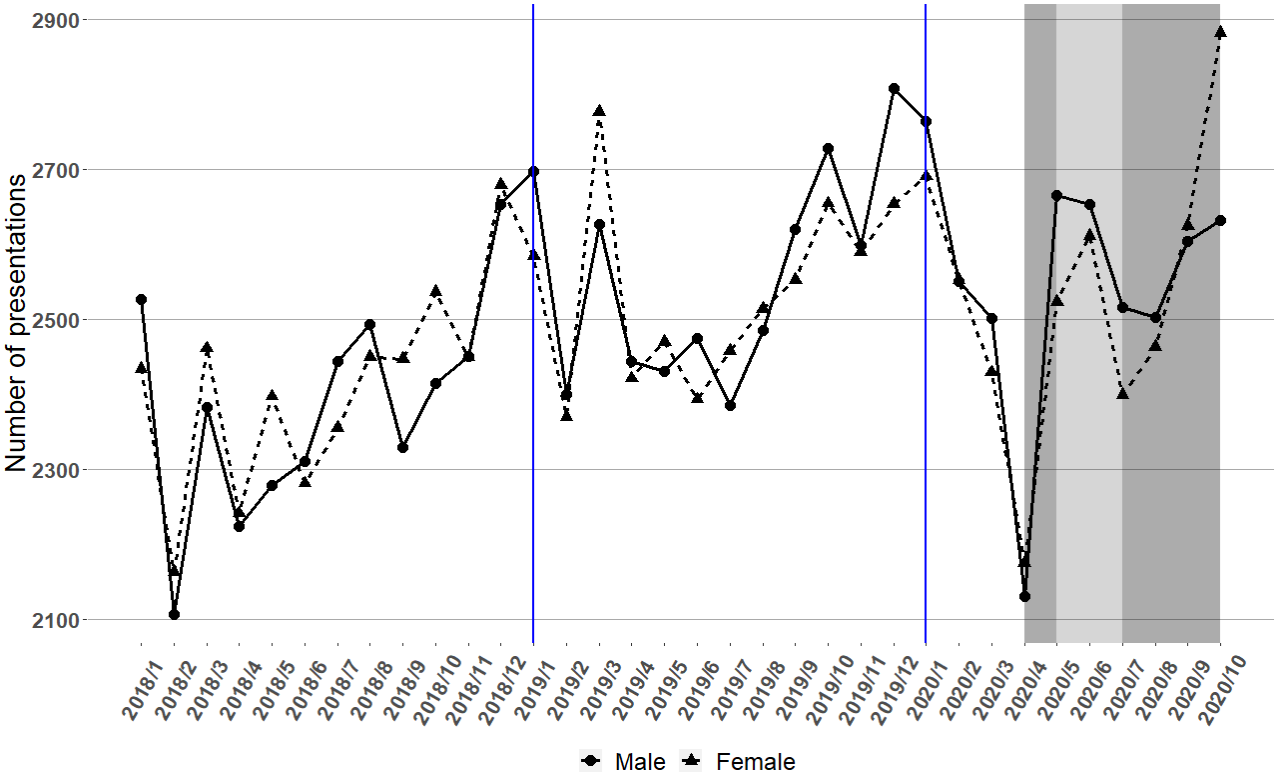
Overall, trends were similar between those from high SES areas and low SES areas, although, there was a larger increase in eating disorder presentations from higher SES areas.

Figure 13. Trends in ED presentations for mental health conditions in adults



Mental health presentations between men and women were closely related for most of the study period. However, **in the latter months of 2020, there was an increase in the number of women presenting to the ED with mental health concerns** compared to men (Figure 14).

Figure 14. Trends in ED presentations grouped by sex for mental health conditions in adults



Policy and practice implications

- Women appear to be disproportionately affected by prolonged lockdowns, with a higher increase in ED mental health presentations than men. This may be due in part to the disproportionate burden of caregiving and home-schooling borne by many women during the pandemic restrictions.
- Mental health supports tailored to women may be required during prolonged or repeated lockdowns.
- Self-harm, substance abuse, anxiety and personality disorder presentations increased during the study period. It is unclear how much of this is the result of limited access to GPs, psychologists, and substance abuse counsellors during the lockdowns, however, efforts should be made to ensure adequate access to telehealth for these conditions.

Pregnancy and Postpartum

In this report, we focus on pregnancy and postpartum presentations that are not captured through the Victorian Perinatal Data Collection, namely, pregnancy conditions < 20 weeks, postpartum emergency presentations and inpatient admissions during pregnancy. The conditions analysed from the VEMD dataset were:

- Miscarriage or threatened miscarriage,
- ectopic and molar pregnancy,
- complications following abortion,
- ectopic or molar pregnancy,
- hyperemesis gravidarum,
- postpartum complications and
- lactation disorders.

The conditions from the VAED dataset were:

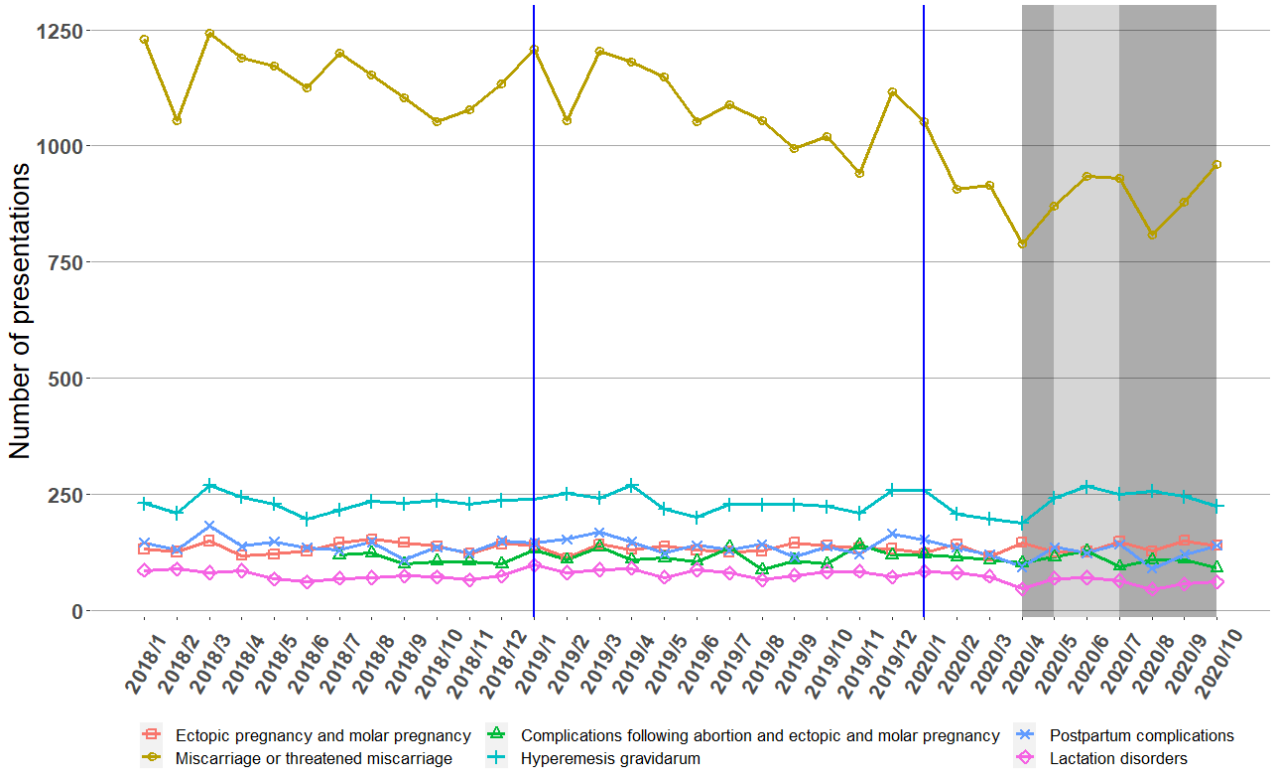
- medical abortion,
- preterm spontaneous labour with preterm delivery,
- preterm delivery without spontaneous labour,
- hypertensive disorder of pregnancy,
- maternal infectious and parasitic diseases, and
- mental disorders in pregnancy, childbirth, and the puerperium.

The reader is referred to the Consultative Council of Obstetric and Paediatric Morbidity and Mortality 'COVID-19 Communique' for other maternal and perinatal outcomes during the 2020 pandemic period.[19]

There was an overall decrease in the number of emergency presentations for early pregnancy and postpartum conditions after the onset of pandemic restrictions. There were averages of 1782 and 1797 total presentations per month in 2018 and 2019 respectively, declining to 1577 per month in 2020. This change was only evident for metropolitan Melbourne and there was no observed association with SES.

The largest contributor to the overall reduction was miscarriage or threatened miscarriage (Figure 15). The proportion of women admitted for this diagnosis after ED presentation increased during lockdown but was no increase in the triage acuity. There were also decreases in presentations for lactation disorders and postpartum complications, though their absolute contribution to ED presentations is small. There was no major difference in presentations for ectopic and molar pregnancy, complications following abortion, ectopic and molar pregnancy, or hyperemesis gravidarum.

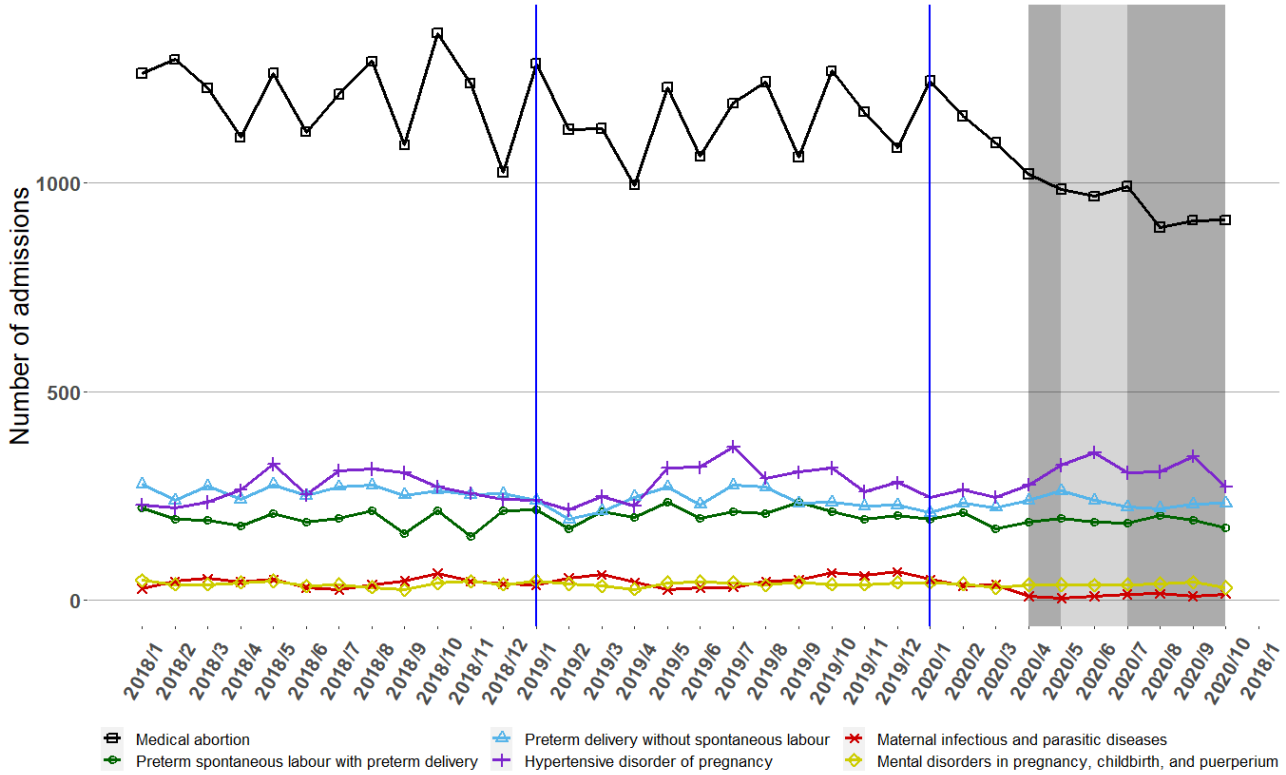
Figure 15. Trends in ED presentations for pregnancy and post-partum conditions



There was also a reduction in total admissions in pregnancy during the lockdown period. There were averages of 2014 and 1969 total admissions per month in 2018 and 2019 respectively, declining to 1790 per month in 2020. This reduction was only observed for metropolitan regions, with no apparent difference by SES.

The decline was predominantly driven by a reduction in admissions for medical abortion (including surgical or medication-induced termination of pregnancy; Figure 16). Surgical terminations have been declining by 5.1% p.a. since the combination mifepristone or misoprostol regime (MS-2 Step) for termination of pregnancy was listed on the Pharmaceutical Benefits Scheme (PBS) in 2013.[20] However, there appeared to be a steeper decline in admissions for termination of pregnancy in 2020 (Figure 16).

Figure 16. Trends in hospital admissions for pregnancy and post-partum conditions



There was also a large relative reduction in admissions for maternal infectious and parasitic diseases, but the absolute numbers were small (20 admissions per month in 2020 compared with 42 per month in 2018). Preterm birth with or without spontaneous labour showed small monthly fluctuations without a consistent overall trend for total preterm births. There was no substantial change in admissions for mental disorders in pregnancy, childbirth and the puerperium, or hypertensive disorders of pregnancy. Maternal admissions to ICU continued to be rare and did not increase during the lockdown period.

Policy and practice implications

- Early pregnancy assessment for risk of miscarriage and ectopic pregnancy and timely access to abortion services are classified as Category 1 (urgent) gynaecological services by the Royal Australian and New Zealand College of Obstetricians and Gynaecolgists.[21]
- The reduction in ED presentations for miscarriage or threatened miscarriage may reflect a reduction in healthcare seeking behaviour for nonurgent symptoms, diversion from ED to other services such as GPs, hospital-based early pregnancy clinics, and telehealth consultations. Further research into understanding the contributors to these changes may improve future models of early pregnancy care.
- The reduction in hospital admissions for abortion should be interpreted in the context of expanded outpatient or home-based medical termination of pregnancy options. We can only make limited inferences regarding changes in abortion practice and access during the pandemic from the available VAED data.
- Flexible, client-centred early pregnancy care is needed to ensure that essential gynaecological services are maintained during lockdown.
- Improved data collection on abortion services (e.g., through PBS prescribing information on mifepristone/misoprostol 'MS-2 step') should be considered to monitor and inform future provision of abortion care during national emergencies.

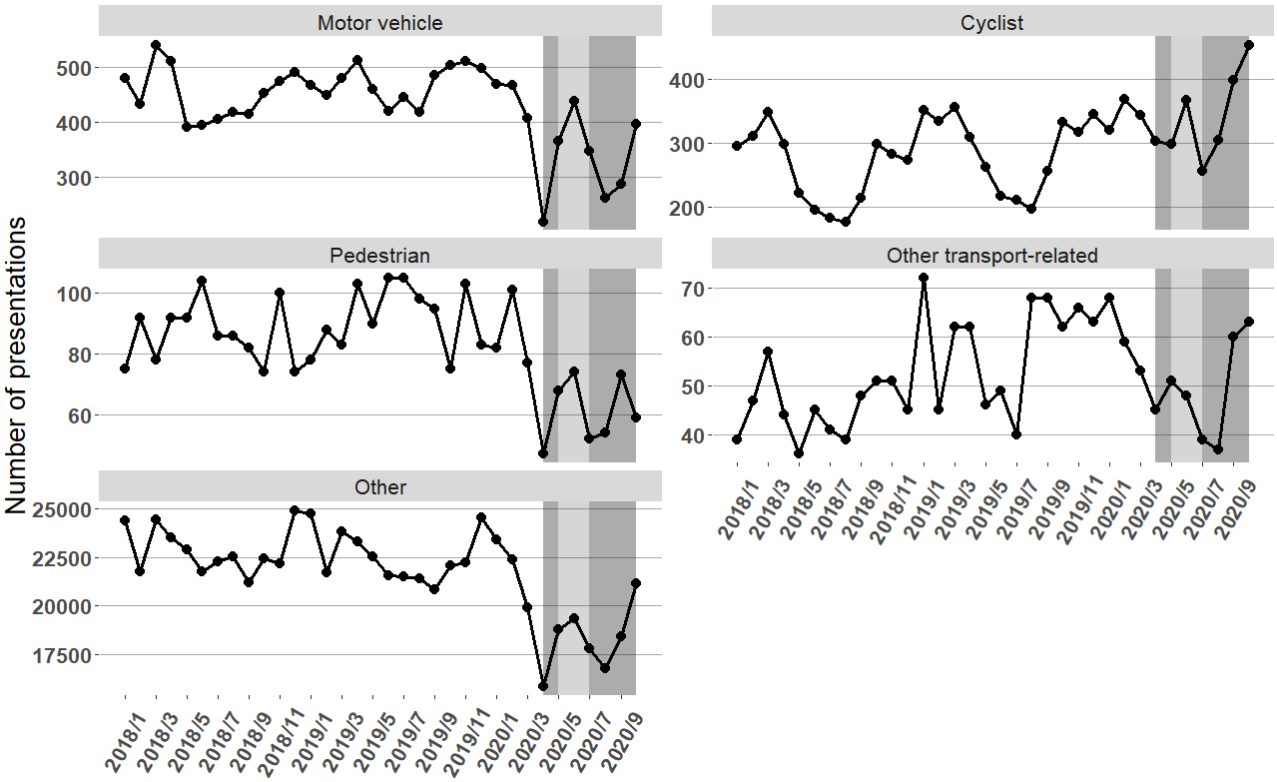
Injuries

There was a large reduction in adults presenting to the ED with injuries during COVID-19, mostly driven by a reduction in non-urgent presentations. This reduction was greater in metropolitan Melbourne than in rural or regional areas.

There were 284,257 ED presentations with injury in 2018, 281,108 in 2019 and 202,238 in 2020 (January-October only). Overall, 56.1% of presentations were by men with a mean age of 46.4 (SD 20.9) years. People from lower SES areas were more likely to present to ED with injuries than people from higher SES areas.

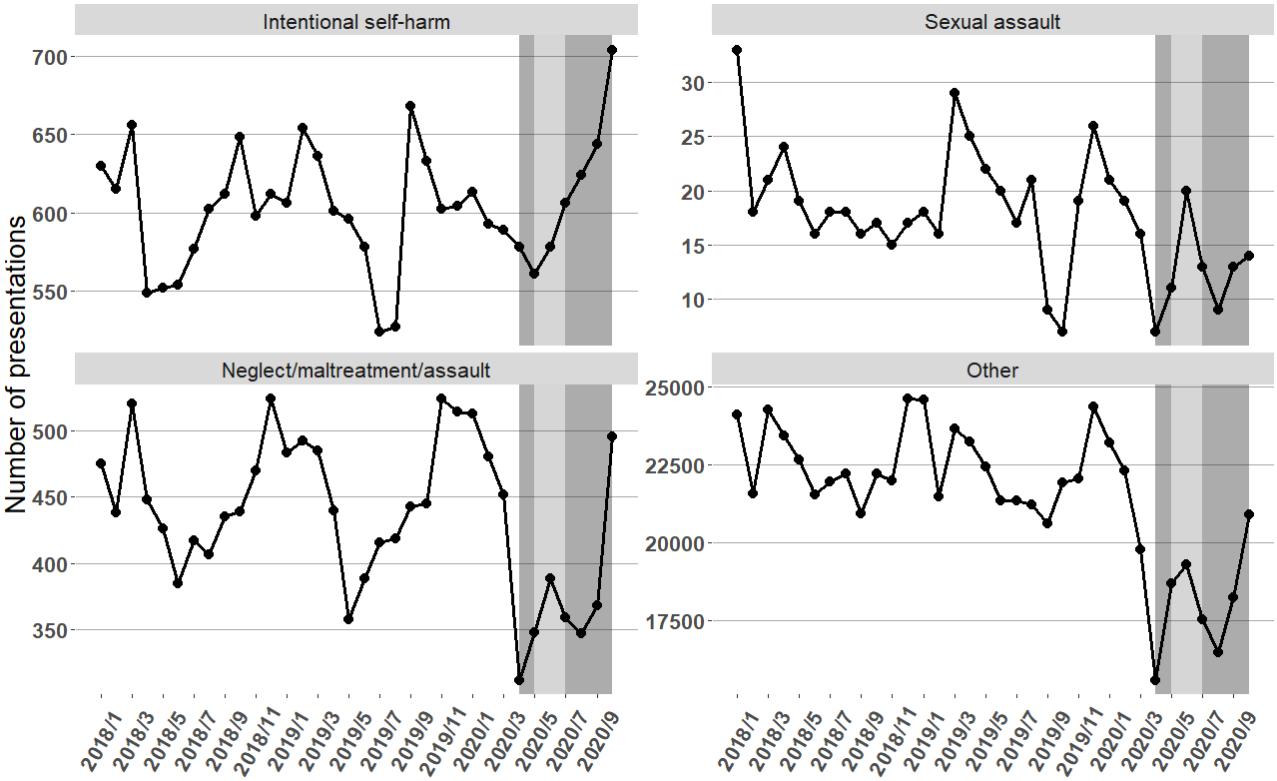
ED presentations for cyclist related injuries increased, while the number of motor vehicle and pedestrian-related injuries dropped (Figure 17).

Figure 17. Trends in ED presentations grouped by cause of injury in adults



ED presentations for intentional self-harm increased, while the number of presentations related to neglect, maltreatment and assault decreased (Figure 18)**.** This decrease was due to a reduction in assault by "other or unknown" assailants. There was no significant change noted in assault by a current or former intimate partner or by other family members.

Figure 18. Trends in ED presentations grouped by injury type in adults



Policy and practice implications

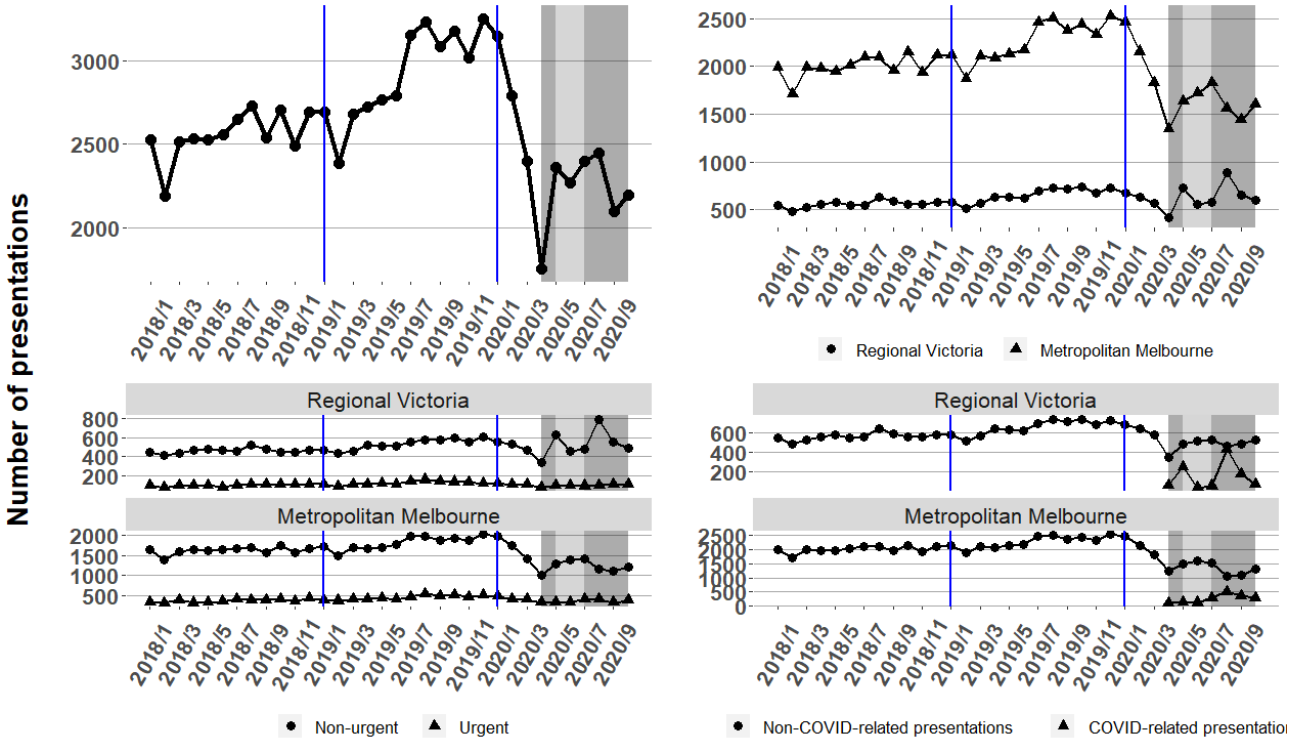
- It is likely that increased bicycle accidents were related to limited opportunities to pursue other recreational activities due to COVID-19 restrictions, and increased uptake of cycling. Safety messages reinforcing helmet use may reduce these injuries.
- The increase in intentional self-harm highlights the importance of addressing mental health issues (discussed above).
- The lack of change in assault by a current or former intimate partner or by other family members is surprising given concerns about increased intimate partner violence during lockdown. This suggests that alternative mechanisms of reaching adults at risk of harm may be required during repeat lockdowns.

Older Adult Health

Residential Aged Care

Many Residential Aged Care Facilities (RACF) elected to institute restrictions on visitation and resident movements from March 2020, that pre-empted formal societal lockdown. Accordingly, there was a significant reduction in the number of people from residential aged care presenting to ED even prior to April 2020 (Figure 19). This was most evident in metropolitan Melbourne, but a similar trend was also seen in regional areas (Figure 19).

Figure 19. Trends in ED presentations in RACF patients, overall and grouped by rurality, urgent and non-urgent, and COVID-19 and non-COVID-19 related

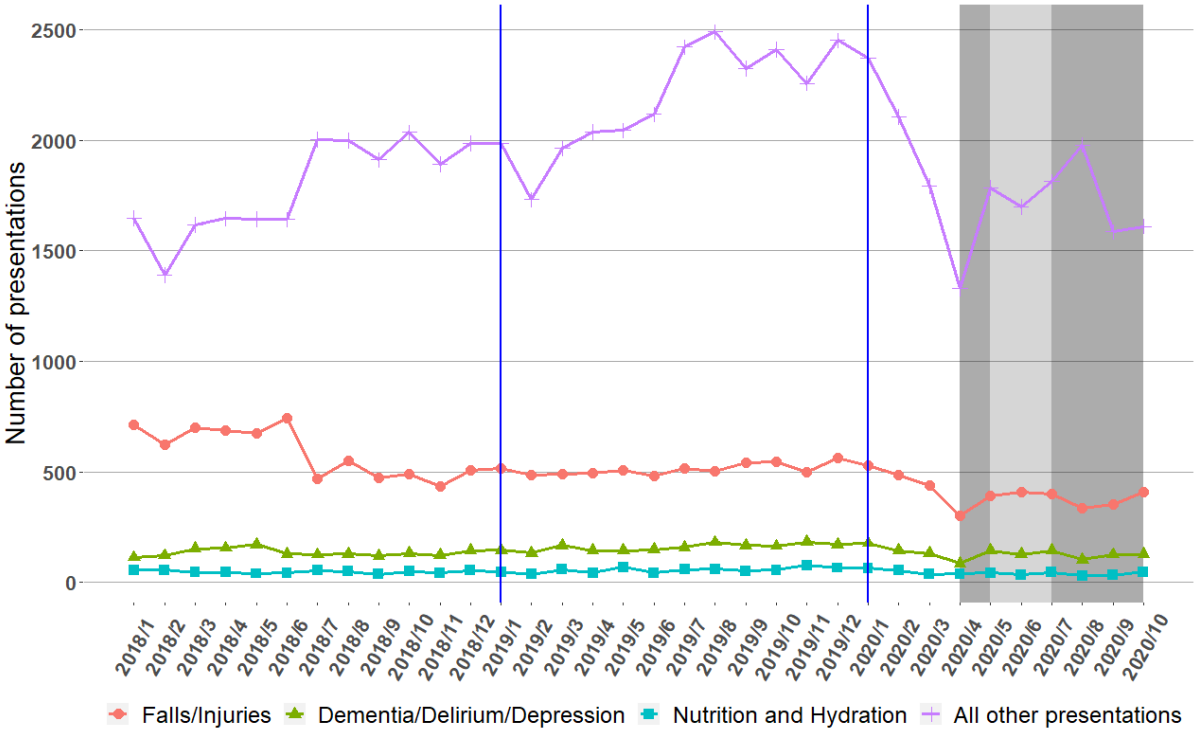


There were 2,855 ED presentations per month in 2018 compared with 2,218 presentations per month in April-October 2020. This was mostly driven by metropolitan presentations, whereas regional presentations (particularly non-urgent presentations) increased during COVID-19 lockdown periods – despite these regions being exempt from the lockdown enforced in metropolitan Melbourne.

Excluding COVID-related presentations, there was a 36% reduction in ED presentations overall for RACF residents during COVID-19 lockdown periods compared with 2018. Presentations related to falls/injuries, dementia/delirium/depression, and nutrition/hydration

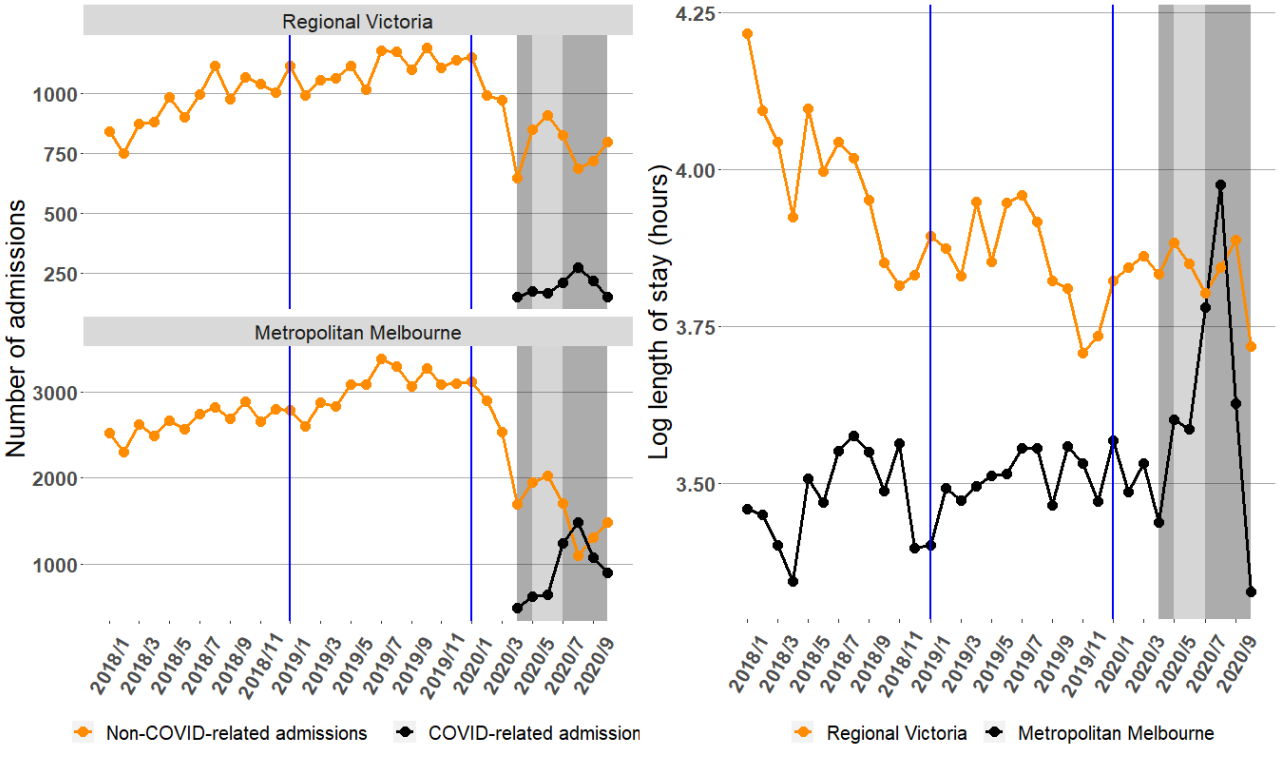
all declined during COVID (16-32%), but to a lesser extent than other non-COVID presentations (39% decline) (Figure 20).

Figure 20. RACF residents ED presentations by condition



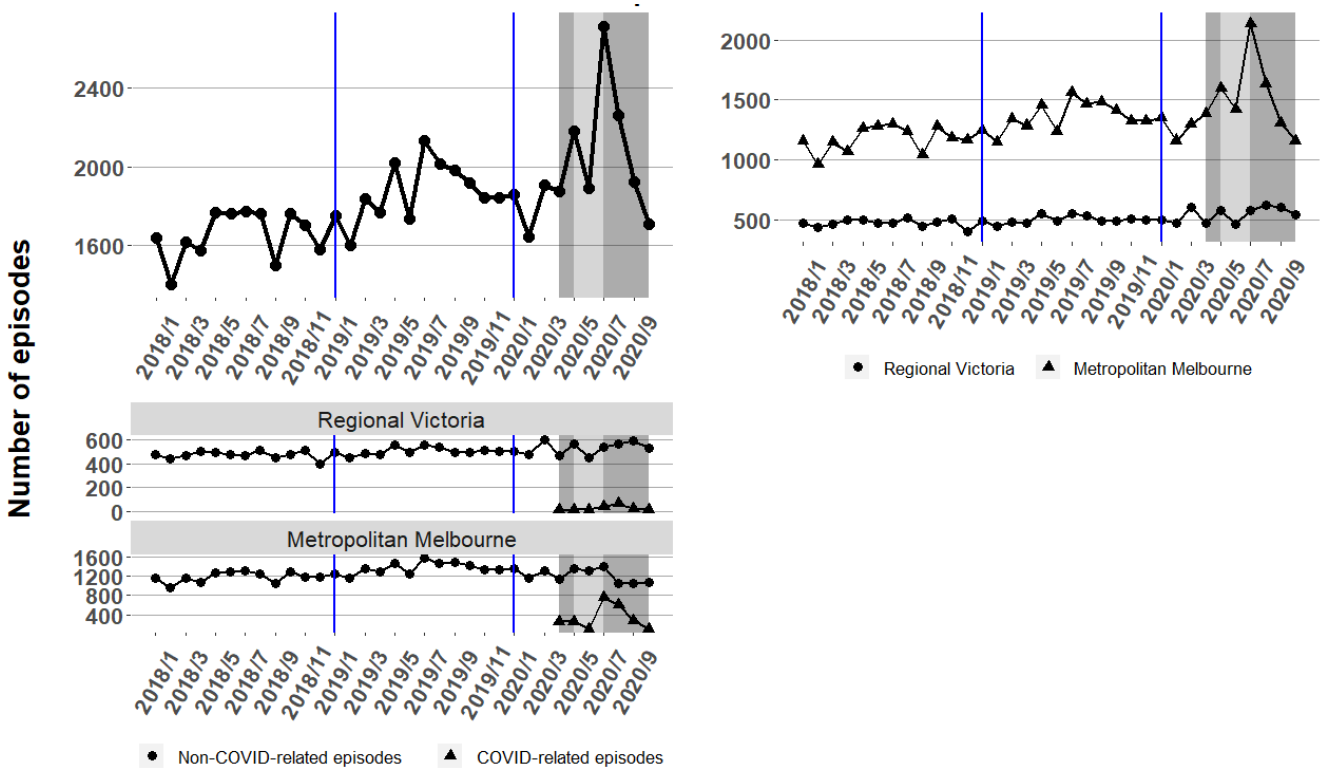
At the peak of the second wave, COVID-19-related presentations accounted for almost 50% of all RACF ED presentations (Figure 19) and greater than 50% of admissions. There was also a significant increase in LOS of admitted RACF patients early in the second wave of COVID-19 (Figure 21).

Figure 21. Trends in hospital admissions and length of stay, by rurality in RACF patients



Residential In-reach (RIR) activity in metropolitan Melbourne rose sharply during COVID-19 first and second waves (Figure 22). During the second wave, a large proportion of this increase in activity was related to COVID-19 or "other respiratory" conditions.

Figure 22. Trends in RIR in RACF patients, overall and grouped by rurality, and COVID-19 and non-COVID-19 related



Policy and practice implications

- RACF visiting restrictions and change to delivery of primary care may have influenced an increase in RIR activity during the first wave and an increase in non-urgent ED presentations in regional Victoria during both waves.
- Reduction in ED presentations and admissions for non-COVID-19 illness during lockdowns in metropolitan Melbourne was met by increases in RIR activity demonstrating the ability of this service delivery model to respond to the dynamic needs of this cohort.
- Substantial increase in inpatient LOS for metropolitan Melbourne is likely multifactorial but may have been due to time taken for clearance of RACF lockdowns, and reluctance from RACFs to receive patients from hospitals (especially without negative COVID-19 tests).
- Coding of presenting diagnoses for RACF residents is challenging as older people commonly present with complicated or undifferentiated illnesses. Some relevant presentations may not have been captured.

- Additional longitudinal data will be valuable to identify effects of deferred presentations for non-COVID-19 indications beyond October 2020.

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