

Maintaining Ambulance Service Capacity During COVID-19

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Background

Paramedics are registered healthcare professionals who provide a wide range of healthcare services to the community. This includes, but is not limited to, emergency critical care, and when required the transport of patients to ongoing care. Paramedics are highly trained and utilize specialized and complex equipment in an often hostile and uncontrolled environment. In Australia most paramedics are employed by individual state-run ambulance services. These ambulance services have seen a sustained increase in workload over many years which has stretched their abilities to meet demand.

A number of states also have non-emergency ambulances, either as part of the state-run service or are privately run. The paramedics and ambulance officers who work in these non-emergency ambulances face many, if not all, of the same issues that are addressed below for the emergency ambulance services.

Community outbreaks of COVID-19 places even more demands on ambulance services resulting in severe pressure and stress on the entire system. Even during non-COVID-19 periods ambulance services are frequently stretched beyond capacity.

The high demands on health services during COVID-19 outbreaks result in equity of access issues for many communities to appropriate and effective emergency care. This is particularly so for people in lower socioeconomic, regional, and remote [communities](#). As such paramedics are often the last, and frequently only, resort for people to access health care as GP services are at capacity and hospital emergency departments are full. As an outbreak escalates health systems become more and more stressed from increased patient numbers, shortages of supplies such as personal protective equipment ([PPE](#)), and [staff absences](#) resulting from staff being furloughed, awaiting testing or becoming infected. This results in already stressed ambulance services battling to cope with increased demands. It is therefore vital that ambulance services are appropriately staffed, equipped, resourced, and prepared to manage the short-term and longer-term surge in demand that accompanies COVID-19 epidemics.

Many of the resourcing issues faced by ambulance services result from lost availability of ambulances due to ramping (ambulances unable to unload patients because emergency departments are full), and other operational constraints. This rapid advice paper addresses the main issues currently facing ambulance services as a result of COVID-19 and provides some quickly implementable recommendations that are designed to have an immediate effect on improving ambulance availability. The paper also provides some longer-term strategic directions that need to be addressed to sustain the provision of ambulance services as Australian states and territories lift restrictions.

Main issues facing ambulance services

Increased demand for services

Local community outbreaks result in increased demands for access to health care resulting in not only increased workloads for ambulance services, but also an increasing loss of ambulance availability due to delays in the handover of patients to hospitals (ramping/bed block). These delays can result in hundreds of hours of lost ambulance availability, severely increasing ambulance response times, resulting in [poorer](#) patient outcomes and paramedic [burnout](#).

Increased complexity of providing care

COVID-19 not only presents with an increased complexity of illness, it requires paramedics to don, assess and initiate treatment using PPE, which also increases the complexity of their care and risks of an [adverse event](#). There are also [reports from Victoria](#) that paramedics are seeing poorer patient outcomes during COVID -19 outbreaks. In NSW, government press conferences reported a [25 minute waiting time](#) for an 18 year old who suffered a cardiac arrest.

Unsuitable PPE

The current PPE used by paramedics which includes standard hospital gowns etc, is intended for hospital use and is [not designed](#) for the harsh out-of-hospital environment, which is affected by strong wind, rain, extreme heat, flammability and are a source of entanglement. This results in increased donning time (time to put on the equipment), risk of dehydration and hyperthermia, injury, PPE breaches and COVID-19 transmission.

Working in an uncontrolled environment

Unlike a hospital setting where patients with COVID can be isolated in a room, preferably a negative pressure one, the paramedic must assess and treat their patients in the community, mostly in the patient's home. This results in the paramedic, using unsatisfactory PPE, being in a room that the patient has been in for many hours, resulting in exposure to a [high viral load](#).

Ambulance ventilation

The level of ventilation in an ambulance is considered poor for a clinical setting, and certainly far below minimum hospital standards for treating COVID-19 patients. Paramedics are frequently required to perform aerosol-generating procedures (AGPs) that would not be permitted in hospitals under the ventilation conditions inside an ambulance . Ambulance services have been slow to introduce new levels of healthcare worker protection such as the use of HEPA filters or isolation hoods in response to these issues. As a result, paramedics are not given the extra protection seen in hospitals. Ramping exacerbates the problems as paramedics spend hours in the confined space of the ambulance with the patient, providing ongoing care that should have been provided in an emergency department. Current processes such as having standard vehicle air-conditioning running fresh air at maximum speed into the driver's cabin can help protect the paramedic driving, but not the attending paramedic in the patient care area of the ambulance. This is also not feasible while being ramped outside a hospital ED as the accumulation of exhaust fumes presents a danger to the patients, paramedics, and anyone in the area.

Ramping/bed block

Ramping not only results in [delayed](#) hospital [care](#) for the patient and lost availability and utilisation of [ambulances](#), but it also places the paramedic at increased risk of transmission as they are required to treat their patients in the stationary ambulance with little to no ventilation for many hours. Ramping is a complex issue and will not be solved overnight, however we must find some quick term temporary solutions otherwise during COVID-19 ambulance services will become dysfunctional. There is a limit to how many ambulances can be ramped before there are none left.

Additional case time

Community outbreaks require paramedics to don and doff PPE for all patients, as well as performing additional end case cleaning and disinfection of their ambulance and equipment. This increases case turnover time, again decreasing ambulance availability resulting in more pressure on services and poorer [patient outcomes](#). It also results in little to no recovery time for paramedics between cases, this combined with the need to work in PPE increases paramedic fatigue and burnout.

Lack of infection prevention and control expertise

There is a lack of infection prevention and control expertise in the paramedicine field. Most ambulance services do not have a specialist infection prevention and control expert, and those that do [lack paramedicine experience](#). This results in infection prevention and control programmes that are not ambulance [focused](#) leading to a lack of confidence in the program and inadequate or [improper](#) use of [PPE](#) by paramedics.

Staffing issues

COVID will reduce ambulance [staffing levels](#) either by staff becoming infected or close contacts (requiring quarantine), both inside and outside of work. Experience from those jurisdictions with a high prevalence of COVID-19 indicates that this can have a significant impact on staffing [availability](#). Ramping of ambulances also decreases staffing by interrupting the normal ability of ambulance staff to respond to new calls. Unlike some professions who can still function while understaffed, or move staff from other areas, each ambulance needs trained specialized staff to operate safely and effectively. As such given the specific skills of these professionals it is not safe to cover paramedic shortages with other emergency service or ADF personnel.

While RT-PCR testing can be used to manage staff exposures this is not always practical in the ambulance setting. There are many ambulance stations in rural and remote areas where access to timely testing is not possible, causing delays in access to testing and awaiting results. Even in metropolitan areas nearly all ambulance stations are not located near testing sites.

Restricted scope of practice

There are hundreds of recently graduated registered paramedics who are competing for the limited number of positions currently available. This group of health care professionals cannot currently engage in clinical practice as they are not yet employed by an ambulance service. Additionally, there are also recently retired paramedics who are not willing, or not able, to continue working in the high demands of on-road paramedic work. However, both groups are still able to engage in other clinical work to support the whole of health response to the pandemic. To do this will require a change in their scope of practice. For example, while a registered nurse or pharmacist can provide vaccinations independently, a fully trained and registered paramedic is not able to. Paramedics are a trained and experienced resource that can be mobilised into other areas of the health system.

Recommendations

Operational

- Ambulance services must review their service delivery models, including staffing levels, rosters, recruiting, and models of care to be able to cope with the prolonged surge demand that [other](#) jurisdictions have seen.
- Ramping must be addressed to increase ambulance availability. This may include the use of external ED triage and holding areas, such as using temporary areas outside the ED that can be scaled up and down as required. There are many rapidly deployable temporary hospital wards, either soft-skinned (tented) or hard-skinned (modular), on the market that can be sourced, including ones with negative pressure capabilities.
- Implement rapid ambulance cleaning, restocking and recovery hubs within or close to hospitals in all metropolitan and major regional sites where crews can drive in and have their ambulance and equipment cleaned and restocked by a dedicated team. This allows ambulances to be rapidly cleaned while the crews can safely doff their PPE and have some recovery time.

- Introduce rapid employment processes of recently graduated registered paramedics to meet surge demand and reduce paramedic burnout risks. This must be across the ambulance service and include emergency operations centre (communications/control) staff and support services.
- Implement rapid antigen testing in areas where COVID-19 numbers are high and where access to RT-PCR testing is limited, or leads to staffing shortages due to delays in obtaining test results.

Health and Safety

- PPE used by paramedics must be reviewed, with testing undertaken to assess the most appropriate type for a pandemic setting and include the use of fit-tested P2/N95 respirators. The review process must involve paramedics and persons with experience in, ambulance operations, respirator fit testing, occupational hygiene and infection prevention and control.
- It is recommended that mechanical engineers be consulted to undertake testing of the airflow within ambulances to mitigate the build-up of contaminated air to reduce the risk of aerosol transmission. This should include testing of ambulances while they are ramped.
- Investigate the use of isolation hoods or other ventilation interventions near the patient to reduce aerosol transmission inside the ambulance.
- Paramedics should have a protocol that bans the use of re-circulation of in-vehicle air-conditioning systems, and advice that air-conditioning systems must be set to outdoor air at all times.

Staff Welfare

- COVID-19 and the restrictions imposed to tackle the pandemic have had a significant impact on the [mental health](#) and wellbeing of the general population and this impact was more significant in frontline healthcare workers. To address the higher incidence of stress, depression and burnout in paramedics associated with the increased demand and complexity of tasks due to COVID-19, strategies to promote and maintain physical health and mental [wellbeing](#) should be prioritised.
- Engage with staff to provide feedback on strategies to improve their working conditions and acknowledge the value of their contribution in providing vital services to the community throughout the COVID-19 pandemic.
- Develop and support collaborations between industry stakeholders, the Australasian College of Paramedicine (ACP), research institutions and international agencies to promote research in mental health and [wellbeing](#).
- Manage workloads through organisational measures such as rostering and deployment of additional resources to prevent [fatigue, burnout and stress](#) and ensure staff have adequate time to recover and [debrief](#) between calls.
- There are well-established links between [nutrition](#), physical health and overall wellbeing. Seek opportunities to ensure adequate access to refreshments throughout shifts such as establishing portable facilities at hospitals or cleaning hubs that can be accessed while their vehicle is undergoing cleaning.
- Ensure availability of a range of [mental health](#) support services that incorporate a holistic, pragmatic and [evidence-based](#) approach.

Regulatory

- Establish an independent national paramedicine infection prevention and control council to oversee and provide expert advice on infection prevention and control.

- Implement a national expert advisory body with state and territory representation to oversee the management of these issues and to coordinate the implementation of any recommendations.
- Review the paramedic scope of practice to enable recently registered or retired paramedics to practice outside of ambulance to support the greater health response to COVID -19.