COVID-19 and the Indo–Pacific: implications for resource-limited emergency departments

Resource-limited emergency departments responding to the COVID-19 pandemic face many challenges — their strength lies in their unique solutions

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The coronavirus disease 2019 (COVID-19) pandemic is stretching hospital resources around the world. Emergency departments (EDs) are on the frontline of care and have been impacted significantly by the surge of patients with both suspected and confirmed infection.[1,2]

Resource-limited EDs in low and middle income countries are particularly vulnerable. Pre-existing issues, including a limited workforce supply, have been exacerbated, and new threats, such as a lack of personal protective equipment (PPE) and oxygen, have emerged.[1,2]

This article explores the impacts of the COVID-19 pandemic on resource-limited EDs across the Indo–Pacific. It considers the unique challenges for the region and describes opportunities for building system resilience at a time of unprecedented demand for emergency care.

Emergency departments and the COVID-19 pandemic

Emergency care systems are essential for universal health coverage.[3] Effective emergency care improves health outcomes, and is critical to achieving the health-related Sustainable Development Goal targets.[4]

EDs are the cornerstone of emergency care systems, enabling access to facility-based care for patients with acute illness and injury. They provide an interface between community and hospital care, and address unmet needs for vulnerable patients. These roles are augmented during communicable disease outbreaks, when EDs fulfil surveillance, triage and clinical care functions.[3,4]

Since the World Health Organization (WHO) declared COVID-19 a global pandemic in March 2020, most low and middle income countries across the Indo–Pacific have reported cases. About 20% of patients require hospital admission, and early recognition and resuscitation can help reduce mortality.[1] EDs therefore have a key role to play in risk-stratifying patients, providing initial therapy, establishing goals of care, and identifying patients who may benefit from advanced interventions.

Pandemic preparedness

The Indo–Pacific encompasses the eastern Indian Ocean and Western Pacific regions, connected through South-East Asia. The region is characterised by cultural, geographical and economic diversity.[5]

The Global Health Security Index reflects a country's ability to detect, communicate and respond to a communicable disease outbreak.[6] Most low and middle income countries across the Indo–Pacific score below the average preparedness level of 40.2 (on a scale of 0–100) and are among the least prepared countries.[6] These findings reflect pre-existing gaps in health care capacity that are likely to be exacerbated during a public health emergency.[7]

A historical lack of investment in emergency care systems across Indo–Pacific low and middle income countries means that many EDs have limited resilience in times of increased demand.[3,4] Emergency care has not been a focus for international donors,[4] and sequential reductions in the Australian Government's development assistance budget for health have further compromised capacity building efforts.[8]

Although these projections foreshadow a devastating impact on low and middle income countries across the region, the global experience of the COVID-19 pandemic has illustrated the limitations of preparedness modelling. Several of the most prepared countries are now disease epicentres with overstretched health services, in part reflecting an initial reluctance to follow WHO advice regarding testing and contact tracing.[9]

Indo–Pacific nations may have strengths that protect against this trend, such as recent epidemic experience.[10] Nimble and innovative responses may help build resilience, potentially providing globally relevant lessons that would typically be expected from high income countries.

Challenges in public health response

A major determinant of the pandemic's impact on EDs will be the success of broader public health interventions. Low and middle income countries, including those in the Indo–Pacific, will face unique challenges in disease containment.[2]

As demonstrated by several Pacific countries, island states have greater ability to shut their borders and limit inward passage of the virus. However, a freeze on international access will have a significant socio-economic impact and is unlikely to be sustainable. It may also affect the supply of essential medical equipment, surveillance capacity (given that certain countries rely on foreign pathology services for COVID-19 testing) and retrieval systems.

An important mechanism to disrupt community transmission of COVID-19 is physical distancing. This is antithetical to many sociocultural practices

across the Indo–Pacific, where communal living is common and regular congregation at community meeting places is the norm. Modelling from a Papua New Guinean setting has demonstrated that physical distancing measures in that community were 60–70% less effective compared with Australia.[11]

Public health responses across the region have already been complicated by extreme weather events and humanitarian crises. Examples include Cyclone Harold, a category 5 cyclone that recently affected the South Pacific, and the climbing infection rate in the worlds' largest refugee camp at Cox's Bazar in Bangladesh.[12] Worsening climate change will further exacerbate the incidence and severity of natural disasters and disease outbreaks.

Challenges for emergency departments

As community transmission increases, demand for ED care will escalate. The impact may be more pronounced among Indo–Pacific communities as a result of high rates of non-communicable disease.[13] COVID-19 appears to be more severe in patients with diabetes, hypertension and chronic pulmonary illness, all of which are prevalent across the region.[13]

Increasing demand is likely to expose pre-existing deficiencies in ED systems and resources, including scarce critical care capacity.[1,2] A survey of emergency care clinicians in the Pacific recently identified minimal integration of surge response with routine emergency care, and a lack of essential processes, such as triage and patient flow.[7] Consistent with these data, Box 1 lists

1 Challenges for COVID-19 preparedness and response in emergency departments (EDs)

Variable	Challenge (and selected examples)
Systems	
Disaster and surge plans	Many EDs and hospitals do not have standard operating procedures for surge events and communicable disease outbreaks: • "ED COVID-19 operations need a focal point of command at hospital executive level so that ED preparatory activities can be prioritised and fast tracked" (Solomon Islands)
Triage	Some EDs have no formalised triage systems. Implementing a triage system, for the first time, during a pandemic is fraught with difficulty
Patient flow	Overcrowding, interdepartmental communication barriers and a lack of ward beds can delay care for both COVID and non-COVID patients
Space	
Isolation and resuscitation areas	Many EDs lack the physical space and infrastructure to adequately provide safe and effective routine care. In the context of the pandemic, a lack of dedicated isolation and resuscitation areas will be a major challenge
Storage capacity	Attempts have been made stockpile essential resources; however, there is a lack of dedicated on-site storage space at many hospitals
Supplies	
Personal protective equipment (PPE) and cleaning agents	PPE supply is a major and ongoing concern: • "There is not a standby supply of PPE … in a normal working day. [There is no] process to ensure a consistent supply of PPE in the department" (Fiji) • "Our hospital is not a central level hospital, [so] we [were not given] much supplies" (Myanmar)
Laboratory testing	There is often limited laboratory capacity, and staff have competing priorities beyond EDs Many testing facilities are offsite or overseas, resulting in delayed isolation, identification and treatment of patients with COVID-19, placing staff and other patients at risk
Oxygen	There is a lack of portable oxygen cylinders and oxygen concentrators in many facilities. Relatively few facilities have capacity for intubation and ventilation
Novel therapies	There is uncertainty surrounding the therapeutic benefits of agents such as hydroxychloroquine, azithromycin and remdesivir. In some countries, these medications are difficult to source, and with international demand increasing, supply will become even more scarce. This will impact the availability of these medications for patients who require them for other indications
Staff	
Critical care training	There are few formally trained critical care staff in many EDs. Additionally, there are concerns about workforce shortages and the reliance on volunteers Some hospital staff do not appreciate the importance of early recognition and treatment: • "[Some staff lack an] initial understanding of the role of ED in the approach to COVID-19" (Fiji)
Staff morale and safety concerns	Many staff are concerned about the risk to themselves and their family members if they are required to care for patients with suspected COVID-19 without adequate protection: • "[There are] difficulties in commuting due to strict curfew/modified lock down and restrictions on inter district transport. [There is] COVID phobia created by the media" (Sri Lanka) • "I don't want them to infect, I don't want them to exhaust, I don't want them to depress, I want to create safe and less stress environment" (Myanmar)

key challenges in systems, spaces, supplies and staff that have become evident to Indo–Pacific clinicians during COVID-19 response planning.[2]

Emerging data suggest that frontline clinicians are at an increased risk of death from COVID-19, in part due to suboptimal PPE.[14] Limited access to PPE is a major threat and will place ED clinicians at increased risk of infection. Low and middle income countries face challenges in PPE procurement because of supply chain limitations as well as market-based competition with high income countries.[1,2]

Illness among health care workers will stretch an already fragile health care workforce. In the event of a surge, EDs will require significant increases in staffing, and the challenge may be exacerbated by high rates of comorbidities, absenteeism and inadequate training.[7,13] Additionally, many Indo–Pacific EDs rely on a sole medical leader for clinical and administrative decision making.[15] The pandemic may place these clinicians at risk of burnout, illness and death, thereby exacerbating the mismatch between supply and demand for care.

Unintended consequences

To meet these challenges, EDs will need to make substantial changes to their processes. However, there is a risk that distraction from pre-existing health priorities will worsen the overall impact.

Patients with chronic disease have poor outcomes at times of increased health system stress, as occurred in West Africa during the 2014 Ebola epidemic when resources were diverted away from routine care.[16]

Lockdown measures will make it difficult for some patients to access emergency care, and fear of acquiring COVID-19 in hospital may create a further barrier to ED attendance. Additionally, the socio-economic consequences of public health interventions are likely to contribute to poor health outcomes in the longer term.

There is also a risk that donor funding will target resource intensive equipment (such as ventilators) that may be unsuitable in a low and middle income country context. Many resource-limited ED clinicians are accustomed to a low cost essential care approach.[1] Rather than emphasising expensive and high risk interventions, a focus on simple measures such as rigorous infection control and oxygen therapy is likely to be advantageous.[1]

The pandemic has already had a gendered impact, exacerbating the "triple burden" of productive, reproductive and community work responsibilities imposed on women.[17] This has been particularly evident in low and middle income countries, where women make up a larger proportion of frontline workers and are disproportionately expected to fulfil unpaid household duties.[17]

2 Strategies for optimising emergency department (ED) preparedness and response*

Systems

- Ensure ED processes are consistent with broader public health and hospital management strategies
- Utilise local case definitions to identify suspected cases
- Establish a clearly marked screening and triage process at the entrance to the hospital, and stream patients based on the acuity of their presentation. For example, low acuity patients might be redirected to a co-located surge clinic
- Maintain infection prevention and control to the highest possible standards. Ensure patients and staff practice physical distancing, cough etiquette and hand hygiene
- Minimise the volume of patients in the ED and isolate symptomatic patients from others by establishing a respiratory zone
- Develop clear admission/discharge criteria and establish ceilings of care for the facility

Space

- Establish a clearly marked screening and/or triage station at the entrance to the facility
- Ensure the ED and surge clinic (if established) have designated waiting areas for patients with respiratory symptoms
- Allocate separate areas in the ED for the management of symptomatic, medium and high acuity patients

Supplies

- Anticipate equipment needs and stockpile to the extent that is possible, especially disposable items that will be in high demand (oxygen cylinders, antipyretics, personal protective equipment, etc)
- Follow World Health Organization guidelines on resource stewardship. For example, implement clear thresholds for providing supplemental oxygen, such as SpO_2 < 90% on room air for stable patients, SpO_2 < 92% on room air for pregnant women, and SpO_2 < 94% on room air for patients with respiratory distress
- Avoid use of therapies that are likely to increase virus transmission (eg, nebulisers)
- Develop safe processes for cleaning and reusing equipment based on World Health Organization infection prevention and control advice

Staff

- Make sure that all staff feel included, empowered, motivated and supported
- Update the staff contact list and plan for absenteeism
- Identify staff who are high risk for infection and reallocate them to other areas
- Train staff in the systems and processes that have been developed
- Remind staff that they should not work if they have acute respiratory symptoms
- Use ancillary staff and other community members for non-technical tasks
- Remind others that COVID requires a whole-of-government, whole-of-health and whole-of-hospital response; the ED cannot do it alone
- Ensure ED staff are involved in the post-pandemic review process to promote ongoing systems improvement and sustainability

* Adapted from Australasian College for Emergency Medicine. Managing COVID-19 across the Indo-Pacific: a guide for resource limited EDs. Melbourne: Australia, 2020. https://acem.org.au/getmedia/3930cc60-abb1-4517-b7af-36da918a3f7b/Managing-COVID-19-across-the-Indo-Pacific-(G763) (viewed Aug 2020). ◆

Addressing immediate needs

Addressing these challenges requires urgent action. While high level guidelines such as the WHO Emergency and Disaster Risk Management Framework[18] exist, these often neglect the practical challenges faced by EDs. COVID-19 guidance for Indo–Pacific EDs must complement WHO recommendations, and be culturally appropriate, fiscally responsible and immediately actionable[2] (Box 2).

Indo–Pacific ED leaders are already implementing COVID-19 response plans. Examples from across the region are profiled in Box 3. These early success stories highlight the capacity of local clinicians to lead disaster response activities and provide meaningful care in the face of escalating health care demand. The Australian Government has provided some support for this effort by contributing funds to the WHO response plan and deploying specialist advisors to selected Indo–Pacific countries.[8]

Opportunities

An increasingly interconnected world, combined with climate change and mass migration, will result in more

3 Examples of successful COVID-19 preparedness and response strategies employed across Indo–Pacific emergency departments (EDs)

Variable	Strategy (and selected examples)
Systems	
Leadership and coordination	Many countries have developed national coordinating bodies that include ED clinicians as key stakeholders. This is a recognition of their pivotal role in crisis coordination: • "Once there were initial reports of care in China, the Ministry of Health had formed a National Taskforce and … ED was invited to participate in it as stakeholders" (Fiji) Identification of key leaders at each stage of the patient journey has been essential: • "The hospital formed its Taskforce and we had devised operating procedures and a flow chart with important contact persons at each stage" (Fiji)
Triage, screening and patient flow	There has been a rapid development of triage, screening and flow systems based on specific criteria: • "For patients with respiratory symptoms and fever … the high acuity patients can be stabilised in the ED respiratory resus and transferred to ICU. Medium acuity patients to be stabilised in the step down area of the respiratory section of the ED. Ambulance will transport patients to the isolation wards and ICU" (Solomon Islands)
Space	
Isolation and resuscitation areas	Guided by experience from Africa during the Ebola outbreak, EDs in Solomon Islands, Fiji, Myanmar and Sri Lanka have undergone significant restructuring of limited spaces to facilitate separate areas for screening, isolation, resuscitation and storage
Supplies	
Infection prevention and control, and personal protective equipment (PPE)	Drawing on experience during the 2009 H1N1 pandemic, EDs have adapted guidelines for the judicious use of PPE, while emphasising that staff safety is a priority: • "Within the storage area in ED of consumables, a cupboard is allocated to store PPE kits and this is tallied and replenished by the Hospital Infection Control team" (Fiji) • "Health care worker exposure assessment protocol was designed" (Sri Lanka) • "Luckily we have many people who want to donate what we need so we are still ok" (Myanmar)
Resource utilisation	Early decisions have been made about distribution of limited resources: • "No CPR will be done on COVID-19 high acuity patients who have (deteriorated) despite maximal non aerosol generating treatment" (Solomon Islands) • "We decided to do respiratory team with only three people, because … when positive case came to our ED only these three need PPE" (Myanmar)
Novel therapies	These are not being used until there is proven evidence of benefit. Local guidelines have been developed: • "Cautious use of fluids except in shock. Use of metered dose inhalers (rather than nebulisers) for asthma exacerbations" (Solomon Islands)
Staff	
Critical care training	Countries have begun re-training staff in critical care and there has been redeployment and re-training of staff from non-essential areas to the ED. Non-medical staff are also being utilised to assist with operational requirements such as cleaning and transportation
Staff morale and safety	There is a focus on open communication and staff wellbeing: • "We did meeting every night with zoom and discussed the problems faced in their duty time … we asked their working capacity … and redrew duty roster" (Myanmar) • "Special quarantine centres with all the facilities were designated for staff members who had problems in home isolation" (Sri Lanka) • "Staff are undergoing medical checks. Staff with comorbidities will not be working in the respiratory section of the ED" (Solomon Islands)

frequent communicable disease outbreaks. COVID-19 provides an opportunity to build resilient EDs that are better prepared for this challenge.

The pandemic is also a chance to enhance the sustainability of routine emergency care through system strengthening, facilitated by multisectoral collaboration between clinicians, governments, technical organisations and donors.[3] This effort should be informed by existing guidance for the enhancement of human resources, infrastructure, governance and processes to improve regional emergency care capacity.[7]

Australian agencies, such as the Indo–Pacific Centre for Health Security, have a key role to play in resourcing this activity. The pandemic provides a unique opportunity for the Australian Government to advance its commitment to strengthening health care systems and deliver on the promise of its Pacific Step-up.[5,8] It also offers a chance to leverage Australia's expertise in emergency care for the benefit of the region.[3]

Conclusion

Time will determine the full impact of COVID-19 on the Indo–Pacific, but global trends suggest that ED capacity may be severely stretched. Responses should target the unique challenges for disease control and emergency care delivery across the region.

Although local ED clinicians are already demonstrating leadership and adaptability in their surge planning, the pandemic provides an opportunity to build resilience in emergency care systems and enhance future capacity for both routine care and outbreak response. Australian clinicians, organisations and governments have a key role to play in supporting this effort.

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