



The impact of COVID-19 on public health systems in the Pacific Island Countries and Territories

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Summary

The Pacific Island Countries and Territories (PICTs) have experienced the coronavirus disease (COVID-19) pandemic in different ways and with different timelines, with some experiencing large outbreaks leading to high levels of morbidity and mortality with significant strain on health systems, while others have had no local transmission or delayed transmission until after vaccine rollouts started. Regardless of COVID-19 trends, the pandemic has had a large impact on the social, political, and economic landscape in the Pacific, the effects of which are still being understood. However, the pandemic has also put renewed focus and investment into public health systems and provided an opportunity for the PICTs to build on existing systems and recent capacity strengthening to improve public health in the Region.

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Introduction

Pacific Island Countries and Territories (PICTs) are comprised of 22 diverse countries and areas. Geography, demographics, society and culture, and health and political systems throughout the region vary substantially. Despite these differences, all PICTs share some key characteristics, including geographic isolation, high rates of communicable and non-communicable diseases, compounded by logistical and financial challenges in designing and delivering health care services. In addition, PICTs are vulnerable to the impacts of natural disasters and climate change.¹ This manuscript summarises some of the broader consequences of the coronavirus disease (COVID-19) pandemic as well as opportunities for public health systems strengthening in the region.

COVID-19 pandemic 2020–2021 in the Pacific Island Countries and Territories

At the onset of the global COVID-19 pandemic, most PICTs implemented rapid border closures and throughout the first year of the COVID-19 pandemic, the PICTs remained relatively free from the direct impacts of the virus. Only Guam and French Polynesia reported large scale community transmission in 2020, with the remaining PICTs reporting small numbers of localised community transmission or imported cases, or no cases at all.² Through rapid border closures and scale up of testing, quarantine and isolation, and contact tracing, outbreaks were largely avoided in the early stages of the pandemic.

By the end of 2021, there have been over 164,000 cases and nearly 2500 deaths across the 22 PICTs.³ Community transmission of COVID-19 has been reported in several PICTs including Commonwealth of Northern Marianas, French Polynesia, Fiji, Guam, New Caledonia, Papua New Guinea, and Wallis and Futuna. However, in 2021, community transmission of COVID-

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PICT	Total cases	Total deaths	Total cases/ 1M POP	Deaths/ 1M POP	Total tests	Tests/1M POP
French Polynesia	72,596	648	255,788	2283		
Palau	4190	6	229,614	329	42,790	2,344,915
Cook Islands	3941		224,010		14,341	815,154
New Caledonia	60,385	312	207,932	1074	98,964	340,777
Tonga	9025	11	83,690	102	363,581	3,371,548
Fiji	64,509	862	71,040	949	506,199	557,448
Wallis and Futuna	454	7	41,701	643	20,508	1,883,715
Samoa	5947	12	29,621	60	43,442	216,375
Kiribati	3074	13	25,048	106		
Vanuatu	6332	7	19,789	22	24,976	78,056
Solomon Islands	12,437	139	17,346	194	5,117	7137
Papua New Guinea	43,660	649	4720	70	249,149	26,935
Niue	7		4253			
Nauru	3		274			
Marshall Islands	14		234			
Micronesia	1		9			
Australia	5,419,380	6787	208,205	261	68,335,670	2,625,359
New Zealand	831,149	564	166,160	113	6,971,077	1,393,630

Table 1: SARS-CoV-2 cases and deaths by Pacific Island Country or Territory sorted by total cases per 1 million population, as of 18 April 2022. Australia and New Zealand are included for reference.
Source: worldometer.⁴⁵

19 has been reported in several PICTs including French Polynesia, Fiji, New Caledonia, Papua New Guinea, and Wallis and Futuna. As seen in Table 1, when accounting for population size, French Polynesia, Palau, and New Caledonia have the highest number of cases by population, but it should be noted that the testing and mortality varies significantly across these and other PICTs.

The outbreaks seen in some PICTs, including those that had previously kept case numbers low through strict border and quarantine measures, emphasises the ongoing risk of community transmission posed by cross-border seeding of cases. This is particularly the case with the emergence of new variants, such as Delta and Omicron which have shown progressively increasing virulence^{4,5}; the rapid spread of more virulent strains has been most prominently demonstrated in Fiji and New Caledonia. In Fiji, for example, monthly reported cases ranged from zero to thirteen cases until April 2021 and most cases were identified in managed quarantine at the border, there were a total of two COVID-19 related deaths, and the chains of transmission from the few cases of local transmission were effectively suppressed. However, in April 2021, a breach in quarantine led to an outbreak that has as of early 2022 resulted in over 54,000 cases, a peak per capita transmission rate that was one of the highest globally, and 700 deaths.^{6,7} This rapid increase in cases put immense pressure on health systems, with reports of overwhelmed hospitals and health workforces.⁸ Transmission rates are assumed to have since decreased, in part due to initial targeted testing in high burden areas,

movement restrictions, and rollout of vaccination, which has seen approximately 93% of the eligible population nationally receive one dose as of early 2022.⁹

As of 13 July 2021, all 22 PICTs have received COVID-19 vaccines and started vaccination activities.¹⁰ This, along with ongoing public health measures such as restrictions on movement and social activities as infection rates increase, increased testing, contact tracing, isolation, quarantine (TTIQ) efforts tailored to the Pacific context,¹¹ are needed to control or mitigate transmission, and prevent overwhelmed health services and excess mortality.

The scope of the broader social, cultural, and economic effects from these measures on PICTs remain yet unknown. However, preliminary data also suggest that essential health services have been disrupted in most countries, with significant effects on provision of and access to care for communicable and non-communicable diseases.¹² Globally, COVID-19 has significantly challenged progress towards the control and elimination of other disease, such as hepatitis and tuberculosis, both diseases that have generally high burden in the PICTs.¹³⁻¹⁵ Initial modelling studies have found that the interruption of programmatic work on HIV, tuberculosis, and malaria in high-burden low- and middle-income countries, could increase deaths by 10, 20 and 36% respectively over five years.¹⁶ Routine surveillance data reporting has also been impacted by the pandemic, with many diseases and syndromic surveillance systems showing significant decreases in reported cases in 2020^{ex}.¹⁷ The extra burden on systems caused by

COVID-19 has led to disruptions or changes in testing and reporting, changes in health seeking behaviours, and changes in disease dynamics caused by public health and social measures such as lockdowns and limitations on travel leading to true reductions^{ex. 18–21}.

Opportunities to improve public health systems

Despite the negative impacts of the pandemic, there are potential opportunities created to improve public health systems. There has been substantial investment into medical and public health systems, and important lessons have been learnt for how to further enhance public health systems.^{22–24} The pandemic has also highlighted the importance of critical issues around decision making, information systems and digital technology regulations, management of scientific and statistical data, affordable and accessible health services, and strong public health capacity, including a trained health workforce. Importantly, there has been an injection of funding made available to PICTs and partner organisations in the region for COVID-19 preparedness and response efforts.^{25–30} The investment in surveillance information systems and laboratory testing and technologies, vaccine rollout, and workforce capacity building and investments in health systems more broadly has the potential to result in lasting improvements on public health capacity in the region.

There have been previous investment and efforts to strengthen the International Health Regulations core capacities in the PICTs. For example, efforts to build surge capacity for outbreaks, including through the Pacific Public Health Surveillance Network (PPHSN) Strengthening Health Interventions in the Pacific – Data for Decision Making (SHIP-DDM) program and certification of Emergency Medical Teams, have been ongoing for many years.³¹ The need for strong public health capacity has also been recognised in the region.³² The importance of resilient health systems was highlighted in 2019, when measles caused outbreaks in several PICTs and public health interventions, including supplemental immunisation activities (SIAs), in affected and non-affected PICTs. However, the reliance on external funding means that efforts for strengthening systems are often interrupted by funding cycles and driven by donor priorities.³³ The recognition from the highest levels of government for the importance of public health efforts in COVID-19 response,³⁴ may also act as a catalyst to sustain and further improve the infrastructure and public health workforce that, in some jurisdictions, was already strengthened during the pandemic.

Strengthening surveillance systems

Most PICTs collect weekly data on priority syndromes that are reported through the Pacific Public Health Surveillance Network (PPHSN) through its syndromic and

laboratory surveillance arms.³⁵ However, there remain limitations to these data, including limited access to laboratory testing, limited sentinel sites, missing reports, reporting delays, fragmented health information systems, and limited and over-burdened workforce. The burden of specific diseases in the PICTs is often not well understood and tends to rely on modelling estimates developed for other countries which may not accurately reflect the true disease burden or dynamics in Pacific countries, where distinct geography and social practices produce different contact patterns and therefore different disease transmission pathways. For PICTs to influence and appropriately prioritise funding and resource allocation, there is a need to improve surveillance for updated estimates based on real and up-to-date data. The investments made into COVID-19 surveillance systems may have future benefits for the surveillance of other diseases. For example, training of health staff to appropriately collect surveillance data as well as increasing skills in epidemiological analysis, interpretation, and reporting will enhance broader health response capabilities. It is worth noting that the characteristics of surveillance systems needed for acute public health threats such as COVID-19 are different to those needed to track other diseases, such as noncommunicable diseases or chronic illnesses. For example, surveillance systems for people living with viral hepatitis would require data linkages over many years to accurately monitor key indicators such as new infections, treatment data, and progression to cirrhosis or hepatocellular cancers. This is compared to an outbreak prone disease such as dengue virus where such long-term data linkage is not required for surveillance purposes. To capitalise on the improvements made in outbreak surveillance systems and apply these to other types of diseases, ministries of health should work to identify where there are overlaps in surveillance goals and, critically, where there are not.

Building laboratory capacity

The geographic remoteness and relatively small population, means that many PICTs rely on established laboratory networks for surge testing or confirmatory testing of various diseases. These networks, such as the PPHSN LabNet and global reference laboratories, allow specimens to be sent between laboratories within the PICTs and globally based on urgency and needs, and provide a network of technical support and expertise.^{36,37} Due to the need for rapid identification of SARS-CoV-2 cases, early efforts were made in 2020 to increase laboratory capacity through investment in laboratory equipment and training of personnel. For example, in the Cook Islands, Vanuatu, Kiribati, closed polymerase chain reaction (PCR) using GeneXpert technology has been used to test for and diagnose SARS-CoV-2 since early 2020. Capacity has been further expanded in these countries in 2021 to include open PCR systems, which allow for a higher throughput of specimen

processing.^{38,39} These investments have the potential for long-term positive impacts on in-country diagnostics for other priority diseases. Investment in technologies and lab personnel add to the broader capability and capacity strengthening that has occurred during the pandemic, but the future impact of this on surveillance systems is contingent upon continued investments for data transfer, analysis, and reporting.

Expanding vaccine delivery capacity

Another area that has been expanded during the COVID-19 pandemic is the capacity for vaccine rollout, particularly for adult populations which is not usually the target of vaccination campaigns. The PICTs have relatively high vaccination coverage for routine immunisation as well as experience with SIAs, most recently following the 2019-2020 measles outbreak in the Pacific when at least three PICTs conducted large SIAs. The vaccination campaigns for COVID-19 have been successful in many PICTs, including in Nauru, Niue, Pitcairn, Palau, Cook Islands and Tokelau for example, where over 95% eligible persons have received at least two doses of vaccine.⁹ In Fiji, the high vaccination rates have been touted as an important component of reduced case numbers.⁴⁰ Other PICTs and some outer islands lag behind targets, as is the case in Papua New Guinea, where huge amounts of misinformation surrounding the COVID-19 pandemic in general and immunisation more specifically, has contributed to delays in vaccine uptake.⁴¹ The concerted efforts to provide clear and timely information products to healthcare professionals and the public, as well as efforts to increase cold chain capacity, will continue to build on previous efforts such as those for the vaccine-derived poliovirus outbreak in 2018.

Building workforce and health systems capacity

Particularly in PICTs where there has been large-scale community transmission, governments and partners have brought in surge capacity to support response efforts in healthcare facilities. This has included surge staff to support daily operations of the healthcare facilities, and to provide specialist training to hospital staff.⁴² The public health workforce throughout the PICTs has also received training and capacity building through in-country and remote support for epidemiology, laboratory and clinical management including through telemedicine.^{30,43} The system strengthening of the healthcare facility personnel and public health workforce more broadly will have lasting impacts and benefit the country/territory moving forward.

The pandemic has placed significant strain of health systems globally, but also seen an increase in investment in health systems. Hospitals have expanded ICU and ward capacity and investment has been made into provision of oxygen concentrators and ventilators^{ex.42} Although vaccination efforts are continuing to be ramped up, the

risk of a second surge of cases amongst the unvaccinated, as has been seen in many countries around the world, means the expanded capacity may be required for a longer time. In places where this investment in the health systems is not sustainable, some capacity may return to pre-pandemic levels. The advances made across healthcare systems have potential for long-term impact and improved health outcomes in the PICTs, but there is a need for investment in sustainable systems to ensure the positive impacts continue to be seen.

Conclusion

COVID-19 is a major threat to morbidity and mortality, health systems and broader social and economic well-being in the PICTs. There is no doubt that preparedness and response efforts for COVID-19 outbreaks and the ongoing threat of transmission have had a significant impact on the PICTs, including those with few or no cases. However, COVID-19 also provides an opportunity for PICTs to benefit from the capacity that has been built and lessons learnt during pandemic for the long-term management and control of other priority diseases, such as hepatitis B, hepatitis C, tuberculosis, diarrhoeal diseases, and vector-borne diseases which are a significant burden of disease in many PICTs. Previous publications offer insights into the possible opportunities afforded to disease specific programmes from the advances made during the pandemic^{ex.14,44} The unique context in the Pacific means that these opportunities require a tailored approach for each PICT, as well as careful prioritisation based on the burden of each health threat.

As immunisation efforts continue to ramp up globally and borders begin to reopen, it is important that the lessons learned and progress made during the pandemic are not lost. Firstly, there is an opportunity to capitalise on and strengthen existing public health networks, such as PPHSN, and systems and programs, such as the Pacific Syndromic Surveillance System (PSSS), Strengthening Health Interventions in the Pacific – Data for Decision Making (SHIP-DDM), laboratory-networks and Emergency Medical Teams. The pandemic has elevated and highlighted the importance of these systems and networks, and this recognition can be leveraged to ensure they are maintained and strengthened. Secondly, newly implemented and improved systems and capacities in surveillance, laboratory, immunisation, and health systems should be further strengthened to ensure these improvements in public health are sustained across the region. It is important to build in ongoing in-depth evaluations that assess the ongoing successes and failures of public health system changes made during the pandemic, and their ongoing relevance, effectiveness and cost effectiveness as health priorities change post pandemic. Thirdly, siloed systems, such as disease specific surveillance

systems, can also become better integrated for more efficient use of scarce human resources and financing to ensure the investments made during the pandemic lead to sustained system strengthening. In the long run, it is important to have a coordinated, unified, regional health security response across differing geopolitical boundaries, political settings, cultures, and health system contexts for a healthy blue Pacific.

Contributors

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Declaration of interests

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests.

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