

COVID-19 Vaccination and Border Restrictions; Evaluation and Outlook on Health and Socio-economic Systems in Pacific Island Countries and Territories

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Abstract:

Pacific Island Countries and Territories (PICTs) have so far used vaccinations and strict border restrictions as preventative strategies to effectively manage the spread of the COVID-19 virus. Much is still unknown regarding the virus and further research study is ongoing. However, recent variants and the number of unvaccinated sections of PICTs suggest that the region could witness new variants until each individual is fully vaccinated. An event like this and the introduction of any deadly variant may have significant socio-economic and healthcare impacts. Strengthening of preventative measures including; increasing the number of vaccinations and taking other quick virus-preventative actions could help reduce the likelihood of the spread and potential damage of the virus in PICTs. These could result in enhancing healthcare and socio-economic systems and contribute to the easing of travel and border restrictions.

Keywords —Border Restrictions, COVID-19 virus, Preventative Strategies, Pacific Island Countries and Territories, Vaccination.

I. INTRODUCTION

Coronaviruses (COVID-19) are a group of viruses that cause a variety of illnesses and have existed for a long time. The new or “novel” virus which caused the Coronavirus disease in the year 2019 is one of several known coronaviruses to infect humans. Scientists believed that this virus had been around in animals and had now crossed over to affect humans. The disease was known to be caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) virus and was first detected in December 2019 in Wuhan, China. It has now become an ongoing pandemic with variants emerging and experts call these strains SARS-CoV-2. The virus can spread from an infected person in small liquid particles through

sneezing, coughing, speaking, exhaling, or singing. Transmissions and infections occur by breathing in the virus or touching a contaminated surface.

Since the first detection of the virus in December 2019, the World Health Organisation (WHO) recorded different SARS-CoV-2 variants and labelled them using Greek alphabets. The date of designation for the Alpha variant which was the first variant was 18 December 2020 and the earliest documented samples were taken from the United Kingdom (WHO 2021). Similarly, the date of designation for the Beta variant was 18 December 2020, and its earliest documented samples were taken from South Africa. The Gamma variant was 11 January 2021 and the earliest documented samples were taken from Brazil. The Delta variant

was 4 May 2021 and the earliest documented samples were taken from India. The Omicron variant was on 24 November 2021 and the earliest documented samples were taken from various countries (WHO 2021). The WHO reports a total of 268 million cases worldwide with 5.3 million deaths as of 13 December 2021 with 8.2 million vaccines administered (WHO 2021). The Omicron variant had been detected in 89 countries and COVID-19 cases involving the variant were doubling every 1.5 to 3 days in places with community transmission and not just infections acquired abroad as of December 18, 2021 (Bloomberg 2021). As an anti-viral preventative strategy, vaccines had been developed and these were intended to provide acquired immunity against the virus. With intense safety monitoring, these vaccines are seen as safer and more effective at preventing severe illnesses from the virus or its spread (CDC 2021). By the end of the year 2021, the world was turning out roughly 1.5 billion doses of the COVID-19 vaccine each month (CDC 2021). Life-sciences data had predicted that by the end of June 2022 a total of 25 billion doses could have been produced (CDC 2021). Local and seasonal spikes in COVID-19 cases could decrease in response to the increase in the number of vaccinated individuals, especially in chronically under-vaccinated PICTs. The occasional new variants capable of outflanking vaccine immunity may also occur. As COVID-19 cases settle, life may return to a post-pandemic normal although success could come at the cost of the occasional variant flare-up, high vaccination rates, intensive care, and new medicines that help reduce the risks of death. Statistically, every region of the world including the Asia-Pacific region was not exempted from COVID-19's spread.

There are 21 tropical and subtropical Pacific Island Countries and Territories (PICTs) and these include; American Samoa, Cook Islands, Federated States of Micronesia, Fiji, French Polynesia, Guam, Kiribati, Marshall Islands, Nauru, New Caledonia, Niue, Northern Mariana Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tokelau, Tonga, Tuvalu, Vanuatu, and Wallis and Futuna. Efforts to keep the COVID-19 virus out of the shores of

PICTS are coming at great healthcare and socio-economic costs for governments. However, these cannot be compared to the costs involved with the virus entering these Islands. A number of these island nations do not have specialized medical resources to effectively provide appropriate vaccines and medical tools as demonstrated by countries like the United States of America (USA), China, the UK, and New Zealand in response to the COVID-19 outbreak. Vaccines such as Pfizer-BioNTech, Moderna, and Johnson & Johnson's Janssen (J&J/Janssen) were approved in the USA and were used as preventative measures in PICTs (The Wall Street Journal, 2021). Pfizer-BioNTech is recommended for 5+ years old and comes in 2 doses which are administered 3 weeks (21 days) apart. A booster dose is also available to individuals at least 6 months after the last dose in their primary series. Any of the three COVID-19 vaccines could be used as the booster dose (Crist C. 2021). A person is fully vaccinated 2 weeks after the second dose. For immunocompromised people, there are additional recommendations of an additional primary dose. Allowing the virus and any of its variants into the shores of PICTs could be tragic.

The majority of the island nations depend on foreign donors for development projects and other medical resources. The largest supply of vaccines to the Pacific had come in the form of the Oxford, AstraZeneca vaccine from Australia. Over the course of 2021, the supply of COVID-19 vaccines to the Pacific had been guaranteed, initially through the COVAX facility and later by Australia and other donors. Most Pacific countries were eligible to access the rapid response COVAX Facility (Lowy 2021). The compact states in the North Pacific were incorporated into the domestic rollout of the United States' vaccine efforts. The realm nations of Cook Islands and Niue also benefited from their unique relationship with New Zealand in gaining access to vaccines. Other donors including Japan and China were quick to make vaccine commitments to the Pacific throughout 2021 (Lowy 2021). On 6 July 2021, Australia made a commitment to share up to 15 million COVID-19 vaccines with the Pacific and Timor-Leste. This was enough to effectively

guarantee supply for the adult population of the Pacific (Lowy 2021). By October 2021, Australia had shared more than two million doses of the vaccines with the region. Although some PICTs remain COVID-19 free, some had recorded cases of the latest variant of the virus Omicron while undertaking its vaccination campaigns (Samoa Observer 2021). The vaccination records reveal a divided Pacific and the rates of vaccination do not follow linear trends in the Pacific due to a range of supply and demand factors. Many Pacific microstates such as Nauru, Niue, and Palau had been advanced in their vaccination efforts and were already achieving near-complete vaccination coverage. Other states such as Fiji and Samoa were also expected to achieve similar milestones in late 2021 or early 2022. However, Papua New Guinea, Solomon Islands, and Vanuatu were on track to be amongst the last in the world to reach high levels of vaccination by August 2026, due to challenges in health sector capacity and vaccine demands (Lowy 2021). Surprisingly, the arrival of vaccines often led to an initial surge in domestic vaccination uptake. However, as vaccination rates increased, other variables such as vaccine hesitancy, difficulty in reaching rural populations, and the number of available vaccinators appeared to slow down the vaccination pace. Studies done on the impact of vaccines suggest that Individuals who were fully vaccinated were 16 times less likely to end up in intensive care or die from COVID-19 than those who were not immunized (Bloomberg 2021). Some PICTs' success in managing the introduction and transmission of the COVID-19 virus into their countries is attributable to the effectiveness of the COVID-19 State of Emergency (SOE) measures, effective leadership, cooperation between all government agencies and public support, tight regulation of borders, quarantine, and isolation of travellers, government approval of travels and limitation to essential traveling only (Yemoh and Taotofi 2021). These measures have provided enough protection against the virus thus far but may not be sufficient for the foreseeable future. Therefore, there is a need for PICTs to work towards peak-to-total vaccination and apply other preventative strategies to reach optimal protection

against current and emerging strains. An evaluation and prediction of what could happen in the next months and years would encourage various governments in PICTs to accelerate their vaccination coverage and effectively manage their borders to reduce virus transmission and strengthen their health and socio-economic operations. Additionally, such exercises would contribute to the reduction of human casualties and consequently lower the financial and socioeconomic costs associated with providing COVID-19 treatments.

II. PREVENTATIVE STRATEGY USING VACCINES; EVIDENCE FROM ASIA AND AFRICA

Global records and statistics of the pandemic and subsequent variants have been destructive to health systems and sectors, as well as various economies in the PICTs. This has led to the introduction of different preventative strategies including mass vaccinations intended to carefully manage the spread of the virus and to provide protection from infections and transmissions aimed at limiting mortality and hospitalization rates. Vaccination is believed globally to be the best defence against contracting COVID-19 (CDC 2021). PICTs could learn from countries like India whose public health collapsed under the tsunami of COVID-19 infections, followed by mass death and fields of bodies buried hastily along the Ganges, but managed to beat the virus and reduce its effects on the country. India's Prime Minister Narendra Modi, reported on October 21, 2021, that India had administered its billionth dose of vaccine (The Economist 2021). He further reported that the dedicated COVID-19 wards in cities such as Delhi and Mumbai were virtually empty. India had proven that vaccination was a very useful and effective tool at limiting infections, severe associated illnesses, hospitalizations, and deaths presented by the virus. China, on the other hand, operated a zero-tolerance for COVID-19 and had administered at least 2.6 billion doses of its killed-virus COVID vaccines, covering some 94% of the population by November 2021 (Bloomberg 2021). The vaccine administered in China was the

CoronaVac, which was made by Sinovac Biotech, and a version from Sinopharm. The vaccination program had gone so well that there had been talks of easing the country's zero-COVID policy and had reopened China to travel again soon. The latest update on the China vaccine was that two doses and a booster of Sinovac's COVID-19 vaccine did not produce sufficient levels of neutralizing antibodies to protect against the Omicron variant (Raphael and Fazel 2021). The subsequent recommendation, therefore, was for those who received Sinovac's shot to take a different vaccine for their booster instead of another Sinovac booster. Researchers estimated that some PICTs would take up to the year 2026 to fully vaccinate their population (The New York Times 2021). A study which was published in December 2021, suggested that the Omicron variant had escaped the vaccines and full immunization required further COVID-19 booster shots (CDC 2021). Studies into the virus are ongoing and what is learned from the countries that had applied these preventative strategies could become useful contributions to the strengthening of protocols and engagement strategies in the PICTs. Much of the evidence collected across the world tend to confirm the stance that vaccination tends to limit the number of people who end up contracting the virus. A hospital boss of the Addenbrooke Hospital in the UK reported that 80 percent of patients who had COVID-19 in general wards and critical care were unvaccinated and this was tragic since the deaths could have been avoided (BBC 2021).

Certain PICTs have a higher number of unvaccinated people and the mutating ability of the virus means that the virus may mutate into other variants until vaccination targets are met. This could impact the healthcare systems with related socio-economic effects due to the lack of medical resources available. Observations on the COVID-19 pandemic could suggest that the ability to reduce mortality and hospitalization rates might depend on rapid responses and medical facilities. The response is seen in the ability to quickly produce the vaccines, personal protective equipment (PPEs), undertake pathological research that produces vaccines from insights into the variants, and the

ability to rapidly provide the preventive medical supplies or what will be needed in medical facilities. Since the impact of the pandemic and its variants on more advanced countries resulted in difficulties in their healthcare systems, PICTs may be vulnerable to any possible viral strains, as they rely mainly on international help for skills, expertise, medical care, resources, and facilities including; face masks and oxygen tanks.

Comparatively, Africa, with a population of more than one billion, had about 1.5 million cases and no indication that a large number of COVID-19 deaths had been missed in spite of low testing rates in the year 2020 (BBC 2020). Africa recorded about 37,000 deaths compared with roughly 580,000 in the Americas, 230,000 in Europe, and 205,000 in Asia (Eurasia Review 2021). Most African countries with less advanced healthcare systems have continued effective campaigns to combat the spread of the virus and thus experienced lower mortality rates (BBC 2020). This is a very significant finding and provides encouragement for PICTs who may have similar challenges in their healthcare systems. Africa's lower COVID-19 mortality rate per the study had been due to various complex reasons which include; the quick action by governments to instil strict public health and social measures, the favourable climate or humidity that appeared to lower the spread of the virus, the good community health systems, the lower population mean age that appears to do better in surviving the virus, the lower life expectancy, and the smaller pool of people living with cardiovascular diseases and few old-age homes (Lawal 2020). This had proven that not only does prevention depend on vaccination, but also on appropriate quick action, mass education campaigns and many other natural factors of which PICTs could emulate.

The havoc the virus had caused in different parts of the world should lead to a change of attitude, encourage the use of vaccinations, and hopefully the urgency for governments to increase the use of vaccinations. For instance, Samoa's vaccination of Measles and its subsequent deaths led to a massive change of attitude towards the vaccination of the nationals when the COVID-19 pandemic arrived. The lessons learned from the Measles contributed to

her urgent government action and vaccination campaigns. Samoa currently has an effective border control, preventative strategy, and a measured response which has proven to keep the virus spread under control (Yemoh and Taotofi 2021).

III. PICTs COVID-19 RECORDS AND FACTORS CONTRIBUTING TO ANTI-VACCINATION

TABLE I
TABLE 1: PICT's COVID-19 RECORDS

		Population	COVID-19 Cases	COVID-19 Deaths	Vaccine doses given (1st and 2nd doses)
1	American Samoa	55,689	10	0	70,933
2	Cook Islands	17,564	1	0	25,339
3	Federated States of Micronesia	102,436	0	0	80,217
4	Fiji	905,956	52,623	697	1,257,375
5	French Polynesia	277,679	46,342	636	324,455
6	Guam	165,768	15,227	270	276,082
7	Kiribati	115,847	0	0	82,167
8	Marshall Islands	58,413	4	0	46,001
9	Nauru	12,704	0	0	14,790
10	New Caledonia	271,407	12,581	280	354,333
11	Niue	2,000	0	0	2,352
12	Northern	56,882	2,205	6	85,020

	Mariana Islands				
13	Palau	17,907	8	0	34,907
14	Papua New Guinea	8,606 million	36,004	589	374,571
15	Samoa	196,130	2	0	262,895
16	Solomon Islands	652,858	20	0	235,918
17	Tokelau	1,647	0	0	1,936
18	Tonga	103,197	1	0	130,236
19	Tuvalu	11,508	0	0	12,114
20	Vanuatu	292,680	7	0	152,697
21	Wallis and Futuna	15,854	454	7	11,939

PACIFIC ISLAND COUNTRIES AS OF 20 DECEMBER 2021

SOURCE: [HTTPS://COVID19.WHO.INT/REGION/WPRO/COUNTRY/AS](https://COVID19.WHO.INT/REGION/WPRO/COUNTRY/AS)

The total population-to-death records provided in Table 1 above, suggest that the amounts of deaths recorded in the PICTs are relatively low. This may also be a contributory factor in tolerating the slow vaccination rates in some of these islands. Should COVID-19 related deaths rise to levels that the islands consider unacceptable, one will expect a swift and sudden response towards vaccination.

The term 'Pacific' also encompasses diversity which reflects the fact that each Pacific group has its own language, etiquette, and protocols (Tiatia and Foliaki 2005). Within the PICTs, there are multiple worldviews and diverse perceptions of illnesses, treatments, and preventative measures used in disease management. There are diverse belief systems, including cultural and religious factors which influences behaviours and attitudes towards wellbeing, and are expected to have affected people's views, responses, and reactions to the current pandemic and the use of vaccinations.

The main issue in certain parts of the Pacific is misinformation (Lowy 2021). For instance, Papua New Guinea's (PNG) vaccine hesitancy had become vaccine phobia from vaccine misinformation which was spread around the country and prevented individuals from taking that very crucial vaccine. Due to misinformation, people were genuinely afraid of using vaccines. The Lowy Institute had recommended a major counter-misinformation campaign assisted by development partners to help with dissemination of accurate messages, which could accelerate and facilitate vaccination efforts. It was predicted that if more was not done to curb the misinformation, an increase in cases or virus transmission could increase the death rate, collapse the health systems, and even spread of COVID-19 (Lowy 2021).

An analysis report for the period 1 January to 30 June 2021 covering Fiji, Kiribati, Niue, Palau, Samoa, Solomon Islands, Tonga, and Vanuatu, reported vaccine misinformation and confusion, vaccine hesitancy, and vaccine advocacy (ABC 2021). In Fiji, there was an unsubstantiated assumption that Pacific countries were used as testing grounds to assess vaccine efficacy and false claims of magnet phenomenon in vaccines, the chemical composition of vaccines (ABC 2021). The misinformation also included the source of COVID-19 with unsubstantiated claims of the virus originating in specific parts of the world, its adverse side-effects or reactions to vaccines, and other conspiracy theories related to the New World Order or a Great Reset (ABC 2021). Failure to guarantee against future infections was seen as proof of the vaccine's ineffectiveness, compulsory vaccination eliminating the people's freedom of choice, and charges for COVID tests by health care providers were also concerns. Other concerns which had contributed to the general hesitancy around vaccines, included the anxiety surrounding reported side-effects with no scientific evidence provided and sometimes perceived contradictions between vaccination and the core values of the Christian faith. Although PICTs have access to various traditional health options in addition to the approved vaccines, an increase in public health awareness campaigns via social media platforms

such as TV, Facebook, radio, billboards, and using Community-Based Organisations, religious leaders, schools, and tertiary institutions to educate the public on the use of vaccines is highly recommended. So far, vaccination through non-traditional options involving the use of approved vaccines had received public attention across the world.

The use of traditional medicine is widespread throughout the Pacific region and it is not confirmed if and to what extent they are used as preventative tools or protection against contracting the virus. Traditional medicine and healing are defined as a health system that evolves from within the community to address personal ailments and community problems within its socio-cultural world view and experiences (Finau et al 2004). Its focus on physical healing like the use of traditional masseurs, the inclusion of spiritual elements of healing, and the use of natural and herbal remedies, appeal to people in the Pacific region. Pacific models of health are based on indigenous Pasifika concepts, knowledge, values, and practices (Health Navigator 2021). The Pacific is more of an extended family-based environment with close-knit communities and therefore, the structures mean clusters are bigger and the chance for transmission and contamination is wider. Any possible introduction of a communicable disease is likely to spread quickly with huge social-economic impact and health services implications.

Some progress had been made in vaccinations, COVID-19 researches and preventative protocols. However, billions of people around the world are yet to be vaccinated. Even as immunization rates rise, there will always be people who are vulnerable to the virus including; newborn babies, individuals who cannot or will not get inoculated, and those who get vaccinated but suffer breakthrough infections as their protection levels ebb. Governments must act quickly and not wait till transmission and deaths from delayed vaccination drive them to increase vaccination rates and demand, which could be too late.

IV. PREVENTATIVE STRATEGIES THROUGH BORDER RESTRICTIONS AND THEIR SOCIO-ECONOMIC IMPACT

The freedom to travel anywhere in the world, integrated global supply chains, and thriving interconnected markets and national economies have been somewhat absent during the pandemic (Forbes 2021). Since March 2020, we have seen travel restrictions and quarantines, national lockdowns, high unemployment, and business closures instead. Effects of the COVID-19 pandemic have been felt on virtually every single country's economy. In fact, as of September 2020, every advanced economy was in a recession or depression, while all emerging economies were in a recession. Many would argue that the interconnection and dependency between countries and globalization could have a significant impact on the economy of affected countries. The effect of COVID-19 on globalization strategies is noticed in the behaviour of national governments, attitudes of consumers, the mindset of executives, and key stakeholders in multinational companies, and the economics of business globalization (Economist 2021). As the Pacific nations tend to increase the vaccination efforts up to an acceptable predetermined number of the whole population and the threats of the virus appear to have been controlled, some of the nations will entertain the possibility of easing their borders to allow economies to rebound from the pandemic led depression. A decrease in hospitalization and mortality rates will most likely be responded to with a possible loosening of borders to near normal or pre-pandemic levels and many will attempt to layer their border easing.

What is worth noting is that, the majority of PICTs used to earn a major part of their Gross Domestic Product from international tourism and connected service providers. The closure of their borders and subsequent losses of international travellers into the countries have all but stopped some businesses and rendered many unemployed. The follow-on impact has been an increase in poverty levels and indebtedness by many of the businesses and households. At the start of the

pandemic, many countries which had citizens working in various capacities called back their citizens. This may have led to the loss of expertise, the wealth of knowledge, the foreign touch, foreign funds, and spending which energized the economy. Economies are now without inputs they previously had. Additionally, there had been losses of foreign workers including foreign aid and developmental project workers. There had also been the closure of airports and their associated impacts on businesses which depended on the inflow of travellers, tourists, people who were previously employees within the airport, and other related workers like the taxis, hotels, tourist sites, etc. It has indeed had a massive impact on the tourism and hospitality industry. The economies that relied on tourism would have suffered greatly due to the closure of airports, with some hotels closing down due to the strain. There had been the loss of jobs with economy-wide ramifications. School closures and class cancellations would have impacted the training and education sectors which also impacts the quality of the labour force, their aggregate input, and the national income. Any COVID-19 cases and transmissions within the economy would also overwhelm the health sector.

The reality is that most PICTs' economies rely on remittances, foreign aid, and development projects. There have been various economic and impacts of quarantine costs, costs of the medical response teams, opportunity costs to the economy of lost labour hours, lost days of work, lost international trade, amidst the consumption levels, and possibly an increase in borrowing and debts both of individuals and economies.

A closed economy resulting from border restrictions mean a negative impact on international trade, foreign investments, the flow of goods and services, and other socio-economic issues. As a result, almost all economies in PICTs are taking every necessary step to facilitate reopening their borders and effectively their economies. Island nations could apply the lessons from those who unduly opened their borders and lost people to the virus. For instance, Fiji was free of community transmission for a year before the Delta outbreak emerged in April 2021. This resulted in the

outbreak's case numbers rising in mid-June, with more than 1,200 new infections daily (Radio New Zealand 2021). PICTs have to be in a state of preparedness and deal with positive cases or variants as they are discovered. The use of a strict zero-tolerance policy expressed in border closures and moving quickly to suppress small outbreaks could be a possible way to prevent the entrance and spread of the virus in PICTs. Some PICTs could create country bubbles, open their borders with a few neighbouring countries and adjust as they deem fit due to any clusters and spikes in situations where COVID-19 cases are present. The border opening may be accompanied by measures like applying a fine on airlines that allow non-fully vaccinated passengers to travel, non-admission for non-vaccinated travellers, quarantine for certain travellers, and other measures. The COVID-19 pandemic is new and as such, there are no proven and tested fail-proof strategies to apply across nations. Many PICTs will be expected to be trying out a set of customized preventatives and managing strategies until it is brought under reasonable control and once borders are opened, we can expect cross-country transmissions till optimal vaccination and an effective vaccine are produced. What is known also, is that there is little chance presently of eliminating the virus, and thus we can expect more outbreaks in classrooms, on public transports, and in workplaces over the coming months, as economies push ahead with the reopening or rebuilding their economies. The threats to the PICTs are not only COVID-19 or its variants but the decisions governments take to handle the existence of the virus.

V. CONCLUSIONS

Governments of the PICTs face the tough task of balancing health concerns with keeping already battered economies going. Many have a mixture of stringent measures like border lockdowns, state of emergency orders, travel restrictions, and bans which make formulating policies difficult. Some have sealed off their borders despite their low count of COVID-19 cases and relatively high levels of

vaccinations. Easing their borders to allow the sectors that have been negatively affected by the pandemic measures to rebuild may just be a matter of time. It is expected that the easing of the restrictions and borders will be subject to set criteria, and most will have a layered method. This is also expected to bring in international funds with an associated impact on foreign exchange earnings.

What is certain is that effective restrictions and vaccinations amongst other natural factors are better solutions in ensuring borders of PICTs stay clear off the virus and the potential negative impacts it can have on healthcare and socio-economic sectors. COVID-19 vaccinations if continued could help protect individuals from getting the virus. Against all the efforts of anti-vaxxers and vaccine breakthrough infections, statistically, the documented benefits of COVID-19 vaccination far outweigh the known and potential risks and would most likely be allowed to continue in most countries.

PICTs may apply the suggestions and preventative strategies from India's vaccination success story to increase the vaccination and take appropriate steps in overcoming vaccine hesitancy, misinformation, and gaps of information regarding vaccines. With regards to its border restrictions, the PICTs must continue to apply a near zero-tolerance approach like China in ensuring no import or transmission occurs until full vaccination, or a global final vaccine solution is realized and most importantly all international borders agree to open their borders. A continued and further research or regulatory controls monitoring and reporting for any vaccine breakthrough infection figures in the PICTs is recommended and may also be an area for further research.

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