

COVID-19 in Fiji

Patrick C Reading^{A,B} and Richard A Strugnell^{B,C}

^AWHO Collaborating Centre for Reference and Research on Influenza, Victorian Infectious Diseases Reference Laboratory, at The Peter Doherty Institute for Infection and Immunity, 792 Elizabeth Street, Vic. 3000, Australia

^BDepartment of Microbiology and Immunology, The University of Melbourne, at the Peter Doherty Institute for Infection and Immunity, 792 Elizabeth Street, Vic. 3000, Australia

^CTel.: 0478 473 924; Email: rastru@unimelb.edu.au

Abstract. With the implementation of strict quarantine and adjunct health measures, Fiji was largely spared from the COVID-19 pandemic in 2020. In April 2021, the arrival of the delta variant of SARS-CoV-2 resulted in a major outbreak that is only now under control. The country enacted swift countermeasures to reduce population movement, but the delta variant gained a foothold in the peri-urban areas of the largest city, Suva, and from there spread to other major urban centres of the largest island, Viti Levu. A very effective vaccination campaign has since been implemented resulting in a rate of two-dose vaccination, above 70%, that exceeds many higher income countries and, as of late October 2021, the numbers of COVID-19 cases were in decline. Fijian life, especially in rural settings, is based on hierarchical but supportive community structures and the responsibilities that flow from community membership, for example, attending large funerals, mitigated against the organised and systematic control response instituted by the Fijian Ministry of Health and Medical Services, including vaccination, and the other Government agencies. A positive consequence of the outbreak has been the development of new capabilities, and the distribution of molecular diagnostic technologies that can be exploited to help control other infectious diseases.

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The Republic of Fiji is a sovereign island nation, located in the South Pacific 3500 km to the east of Cairns, Queensland, Australia. Fiji is an archipelago of about 300 islands, of which more than 100 are permanently inhabited, and is recognised as an Upper-Middle Income country by the World Bank. Fiji has a strong recent history in evidence-based medicine and particularly in vaccine implementation¹.

Health in Fiji is the responsibility of the Fiji Ministry of Health and Medical Services (FMHMS) which operates an effective, hierarchical system comprising central oversight, with services provided from 4 geographical Divisions (Central, Northern, Eastern and Western), each with key Divisional hospitals, sub-divisional hospitals, primary care health centres and nursing stations. Management of notifiable infectious diseases rests with the Ministry, and infection disease control is managed by key Ministerial advisors, and the Fijian Centre for Disease Control (Mataika House). Through much of the pandemic, the FMHMS has published an almost daily, detailed and transparent update of new COVID-19 infections and produces a useful and interactive map of Fijian cases (<https://experience.arcgis.com/experience/db0cf0a2827d4c718a5a9ad823482028>).

The simple fact that Fiji avoided a major outbreak in early 2020 during the first wave of the global pandemic speaks to the

coordination of medical and immigration services in Fiji, and the very effective and rapid interventions put in place to limit entry by, and then to quarantine of, visitors to Fiji in 2020 and early 2021. From 28 March 2020, ‘hotel quarantine’ was conducted at designated sites near Nadi International Airport. Regardless of symptoms, all travellers were placed under strict 14-day isolation and monitored daily by a medical team. During their time in quarantine, the passengers were not permitted to leave their rooms or to receive any visitors.

In April 2020, the Fijian border was essentially closed to non-nationals of Fiji. From 27 June, and while not encouraged, it was possible for some expatriate Fijian citizens to return to Fiji; however, a ‘hard border’ was applied to all those Fijian citizens who had been in specified countries including the United States, Europe, and China within 14 days of their intended travel to Fiji, including those seeking to transit Fiji. Restrictions eased further in late July 2020, when Fijian ‘residents’ (i.e. non-citizens of Fiji but resident in the country) were allowed to return via New Zealand, without quarantine, but after testing. From 29 December 2020, travel was possible from countries that had sufficiently controlled the first wave of COVID-19 infection, including New Zealand. The decision regarding strict quarantine no doubt impacted tourism in a country

that generates approximately 35% of its GDP from international travellers (<https://onlinelibrary.wiley.com/doi/10.1002/ocea.5273>) exploring the natural resources that are found in Fiji.

During the COVID-19 first wave in 2020, cases were initially reported in Latuoka, Suva and Labasa, which were declared 'active hotspots' and placed into mandatory lockdowns of all non-essential businesses². The ability of Fiji to control these early cases, likely associated with the alpha variant, was attributed to: (1) strict adherence to WHO Guidelines; (2) open and transparent communication; (3) continuous updates via social media and radio; and (4) strong partnerships and engagement².

While Fiji was largely spared from COVID-19 infections in early to mid-2020 by the implementation of rapid and positive interventions, the country has since suffered a major COVID-19 outbreak from April 2021 (data below), which has resulted in approximately 50 000 cases (out of a population of approximately 900 000), and has caused more than 650 deaths (Figure 1). This community attack rate of >5% is less than that seen for the Delta variant in other countries², but comparisons are made complex by vaccine penetration rates. Assuming most infections were identified, the case fatality ratio is approximately 1%. This is a relatively good outcome compared with many other high and low-income countries and highlights the quality of healthcare that is generally available in Fiji (<https://coronavirus.jhu.edu/data/mortality>).

The first case of the second wave was reported on 18 April 2021 and the outbreak was nucleated at a managed quarantine facility after contact between a couple returning from India to Fiji, and a soldier. The vast majority of cases in what became known as the 'April Outbreak' were initially contained to the most populous island of Fiji, Viti Levu, and particularly in and around the capital, Suva. During the pandemic to-date, the Ministry has recorded the results of

more than 375 000 diagnostic tests for SARS-CoV-2, and conducted 340 000 tests since the April Outbreak commenced. Again, on a *per capita* level, these are high testing rates. The numbers of molecular tests required daily during the second wave necessitated modification of existing testing procedures, including expansion of the diagnostic network and the pooling of clinical samples. Steps are underway to develop in-nation DNA sequencing capacity, which can be used to distinguish between different variants of SARS-CoV-2, as well as other pathogens.

In a remarkable if unheralded feat, as of 30 September 2021, 448 000 Fijians had received two doses of COVID-19 vaccines, with another 150 000 receiving the first dose, out of an eligible population of 618 000, meaning that >95% of the eligible population (≥ 18 years) had received at least one dose of COVID-19 vaccine. The types of vaccine used depended on the donor. The mass vaccination campaign has now moved to specifically target communities with low coverage. Fiji demonstrated during a measles outbreak in late 2019 that it could respond with very high vaccination rates in the targeted populations.

What was different in April 2021 and why was the early case load not so readily contained?

As discovered elsewhere (e.g. Australia), two forces at least impacted the ability of Fiji to meet the challenges of the second wave of COVID-19. The evolution of the SARS-CoV-2 virus from the alpha variant to the delta variant was associated with increased transmissibility, which has played out in the more infrastructure-poor environments surrounding Suva where population density is greater and social distancing is more difficult. Coupled with 'lockdown

Fiji situation

52,247

confirmed cases

674

deaths

Source: World Health Organization
Data may be incomplete for the current Dec 31 day or week.

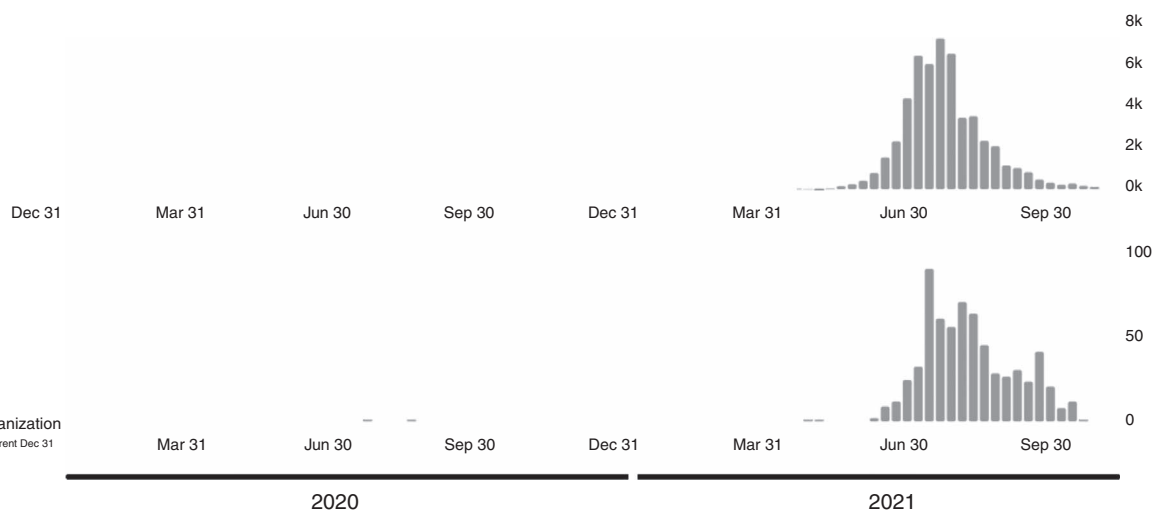


Figure 1. WHO data on COVID-19 case numbers in Fiji (<https://covid19.who.int/region/wpro/country/fj>).

fatigue', and more locally the natural community-based 'way of life' in Fiji, entry of the virus into higher population density environments provided greater opportunities for viral transmission.

The relatively poor containment of the most recent wave of infection is not unique to Fiji. In Australia, for example, the delta variant of SARS-CoV-2 caused infections in New South Wales and Victoria at the rate of 1000 and 800 cases per day, respectively, in late September. The resurgence of COVID-19 in Fiji and Australia shares some interesting features; the financial burden of COVID-19 on businesses applied pressure on Governments to 'open up'. Faith was rapidly developed in the ability of vaccination to reduce COVID-19 hospitalisation and death, and ideally transmission. There was also a shift in messaging to 'living with COVID-19' in both countries, alongside overconfidence in containment measures following successes with the alpha variant, and a reduction in simple measures such as social distancing, mask wearing, and hand washing/sanitisation.

To date, the COVID-19 vaccination program in Fiji has been exemplary, despite some anti-vaccination 'fake news' that was spread by social media³. Using different vaccines donated from a variety of sources including Australia, New Zealand, Japan and the USA, the FMHMS has very efficiently implemented a vaccination program with high coverage, leading the Fijian Government to declare, in mid-September 2021, that Fiji would open its borders in November 2021. In parallel, the FMHMS been clear in its communications with the Fijian peoples that 'there will always be people vulnerable to the virus even as we increase our vaccinations coverage' (<https://www.health.gov.fj/26-09-2021/>). The Ministry went on to ask 'for all workplaces and business places to establish strategies to ensure personal COVID safe practices continue and are monitored and improved and escalated. We also remind all businesses and workplaces that there is an urgent need to refocus on improving ventilation and air quality to support their current COVID safe measures'.

In Fiji, as in many countries, the impact of COVID-19 has gone well beyond those individuals infected by the coronavirus. There is no doubt that the global pandemic has interrupted progress by all countries towards attaining Sustainable Development Goals (SDGs). The SDGs include various elements including life below the water and life on land; both very relevant to Fiji with its economic emphasis on tourism⁴. 'PPE pollution', which is a new phenomenon, has been called out for special attention in Fiji where tourism plays such an important economic role⁴.

What has the COVID-19 pandemic taught Fijians about their healthcare capacity?

Like all healthcare systems exposed to the pandemic, COVID-19 has severely stress-tested resources, from primary care to

intensive care in Divisional Hospitals. The pandemic demanded some innovative thinking and Fiji responded. Fiji adopted a contact tracing phone application called *careFiji*⁵. The implementation of *careFiji* identified more fundamental information technology issues in the country – relating to the wide variety of mobile phones in use in Fiji (many of which did not support the technology), the 'data cost' of downloading the app, which was offset by generous subsidies by the main IT companies in Fiji, and problems with QR scanning that required a more stable Internet than was often available.

The arrival of the pandemic encouraged the development of infection modelling, using data generated from New Zealand⁶. This work, by scientists at the Fijian National University (FNU), was supported by collaborators in Japan. The modelling used a long short-term memory (LSTM) network-based model⁷. While still early in its evolution, the capacity to model infection dynamics is a key capability for health systems, which is used to drive resource allocation and general decision making. Lastly, molecular diagnostic testing was decentralised from Mataika House to other major Hospitals on Viti Levu, and specialised facilities servicing the international airport at Nadi.

Conclusion

In Fiji, there is some natural protection against an imported disease through geographical remoteness and the lack of land borders with other countries. Against these advantages, COVID-19 is a disease that is readily transmitted especially in households and close-living communities. The social structures and mores that exist in Fiji may have also contributed to transmission, especially during the second wave. A study of social gatherings and social distancing at Fijian *iTaukei* funerals during the pandemic revealed some wide discrepancies in compliance with COVID-19 rules⁸, depending on whether the funeral was urban or rural. The conclusions of the study contained some powerful reminders of the attributes that promote transmission of infectious diseases like COVID-19. The *iTaukei* (i.e. indigenous Fijians) that were studied were described as vulnerable, collectivistic communities with comorbidities, which can be highly mobile and social, particularly at funeral gatherings. The study argued that better control would be achieved through behavioural change and enforcement⁸.

The Fijian health system, like those of many countries, was stress tested by the COVID-19 pandemic but the vaccination response leading to a >70% two-dose coverage of all eligible recipients by September 2021 is a testament of the general will of this island country to defeat this significant health challenge.

Conflicts of interest

The authors declare no conflicts of interest.

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Biographies



Patrick Reading holds joint appointments in the Peter Doherty Institute of Infection and Immunity as the Educator at the WHO Collaborating Centre for Reference and Research on Influenza and as a Professor in the Department of Microbiology and Immunology, The University of Melbourne. He has been working with diagnostic laboratories in the Asia Pacific Region for over 10 years to implement and monitor the effectiveness of new technologies for respiratory virus detection and characterisation, as well as improving laboratory management and quality systems.



Dick Strugnell is a molecular microbiologist with expertise in vaccine development, and holds a Professorial Fellow position at the Peter Doherty Institute of Infection and Immunity, in the Department of Microbiology and Immunology, at The University of Melbourne. He is a member of the TY-FIVE consortium assisting with the implementation of the typhoid conjugate vaccine into Vanua Levu, Fiji, and the subsequent analysis of impact, while continuing basic research into *Salmonella enterica*.

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