

# Redesigning Prehospital Care: Fiji's Response to the COVID-19 Pandemic

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## Abbreviations:

AED: automated external defibrillator  
COVID-19: coronavirus disease 2019  
CWMH: Colonial War Memorial Hospital  
FEMAT: Fiji Emergency Medical Assistance Team  
PHECCC: Prehospital Emergency Care Coordination Center  
VFR: Volunteer First Responder  
WHA: World Health Assembly  
WHO: World Health Organization

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## Specific Event Identifiers

- a. Event Type: Infectious Disease Outbreak
- b. Event Onset Date: April 2021
- c. Location of Event: Suva, Fiji
- d. Geographic Coordinates in Latitude, Longitude, Elevation: Longitude 178.450078, Latitude -18.124808, Elevation 43m
- e. Dates of Observations Reported: July–October 2021
- f. Response Type: Medical Relief

## Abstract

The benefits of emergency care systems in low- and middle-income countries are well-described. Passed in the wake of the coronavirus disease 2019 (COVID-19) pandemic, the World Health Assembly (WHA) Resolution 76.2 emphasizes the importance of communication, transportation and referral mechanisms, and the linkages between communities, primary care, and hospital care. Literature describing prehospital care and ambulance system development is scarce, with little data on the effectiveness and cost effectiveness of different options. Prehospital care systems in Pacific Island countries are under-developed. In Fiji, out-of-hospital care is fragmented with an uncoordinated patchwork of ambulance providers. There is no scope of practice or training requirement for providers and no patient care records. There are no data relating to demand, access, and utilization of ambulance services.

In response to a surge of COVID-19 cases in 2021, the Fiji government created a Prehospital Emergency Care Coordination Center (PHECCC) in the capital Suva, which was operational from July–October 2021. Access was via a toll-free number, whereby the public could receive a medical consultation followed by phone advice or dispatch of an ambulance for a home assessment, followed by transportation to hospital, if required. The PHECCC also provided coordination of inter-facility transport and retrieval of the critically ill.

The system that was created met many of the prehospital care standards set by emergency care leaders in the region and created the first dataset relating to ambulance demand and utilization. This is the first article to document prehospital system development in the Pacific region.

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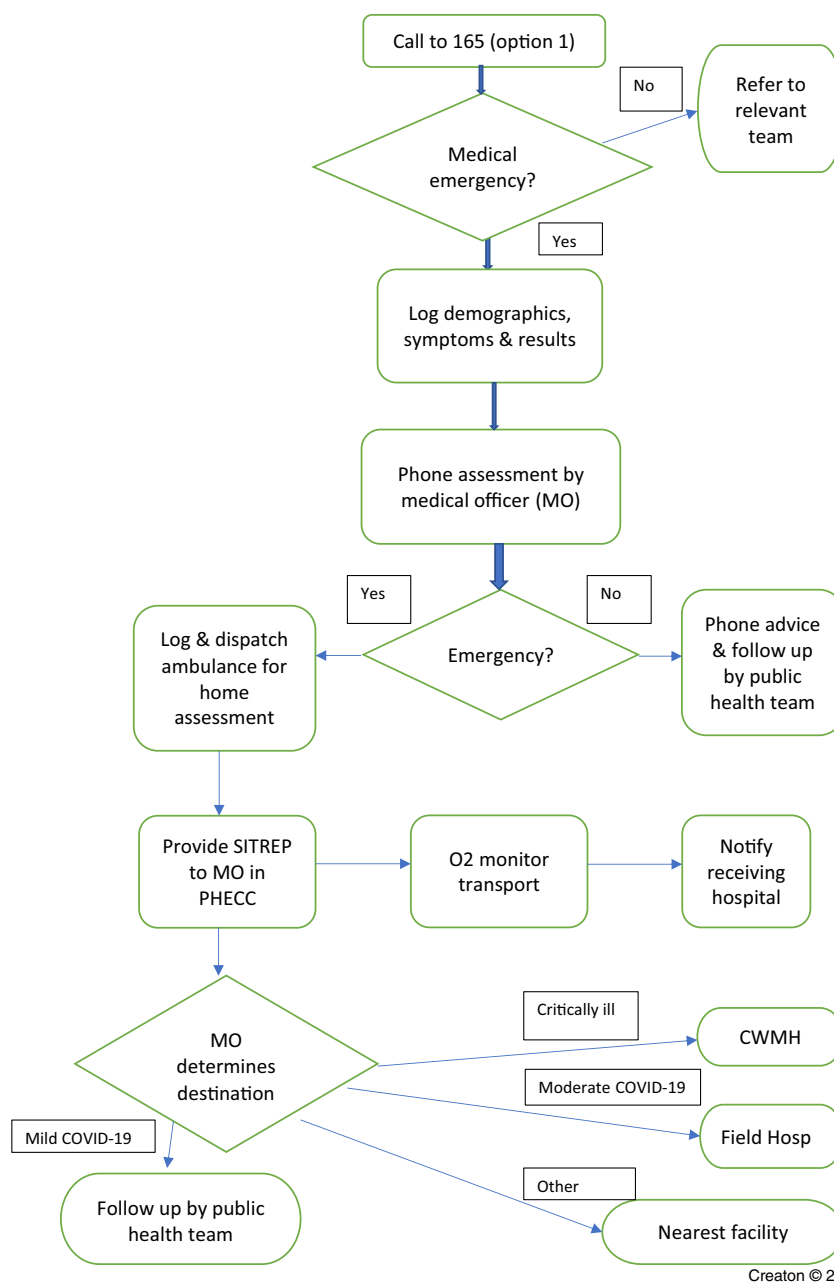
## Introduction

The benefits of emergency care systems in low- and middle-income countries are well-documented.<sup>1,2</sup> The World Health Organization (WHO; Geneva, Switzerland) describes emergency care within a systems framework and has developed resources to assist countries with emergency care system development.<sup>3</sup> The World Health Assembly (WHA) Resolution 72.16 enshrines emergency care as an integral part of universal health coverage.<sup>4</sup>

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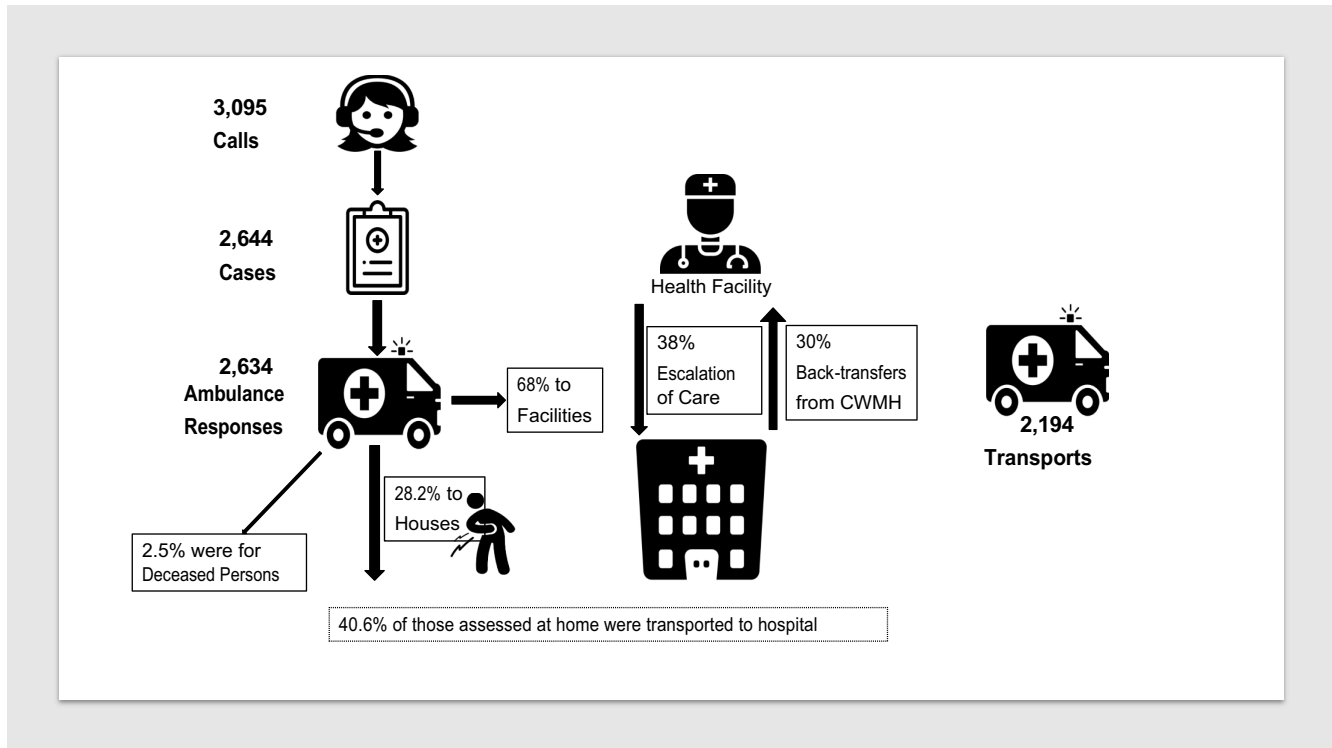
**Figure 1.** Handling of Calls to Medical Helpline 165 (Option 1).

Abbreviations: MO, medical officer; PHECCC, Prehospital Emergency Care Coordination Center; O2, oxygen; CWMH, Colonial War Memorial Hospital; COVID-19, coronavirus disease 2019.

Passed in the wake of the coronavirus disease 2019 (COVID-19) pandemic, the WHA Resolution 76.2 emphasizes the importance of communication, transportation and referral mechanisms, and the linkages between communities, primary care, and hospital care.<sup>5</sup> With a focus on prehospital trauma care, the WHO recommends a two-tier system starting with tier one (community volunteers and first responders) and progressing to tier two (trained certified professionals) if resources allow.<sup>6</sup> Literature describing prehospital care and ambulance system development is lacking with little data on the effectiveness and cost effectiveness of different options.<sup>7-11</sup>

As is the case in many low- and middle-income countries, prehospital care systems in the Pacific region are under-developed.<sup>12</sup>

In Fiji, out-of-hospital care is fragmented with an uncoordinated patchwork of ambulance providers. There is no scope of practice or training requirement for providers and no patient care records. There are no data relating to demand, access, and utilization of ambulance services. In the last decade in Fiji, there have been improvements in facility-based emergency care as a result of post-graduate training in emergency medicine and nursing and dissemination of trained staff and clinical guidelines. Informal networks between those working in emergency departments, primary care, and those in the prehospital arena have developed, which have enhanced communication and streamlined referral processes. A Volunteer First Responder organization, VFR Fiji,<sup>13</sup> in collaboration with facility-based emergency care leaders, have



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**Figure 2.** PHECCC Activity Infographic.

Abbreviations: PHECCC, Prehospital Emergency Care Coordination Center; CWMH, Colonial War Memorial Hospital.

facilitated multi-agency training sessions to raise standards and promote a consistent approach to prehospital care.

In 2021, in response to a surge of COVID-19 cases, the Fiji government created a Prehospital Emergency Care Coordination Center (PHECCC) in the capital Suva. The objective of this paper is to describe the structure and functions of the PHECCC and present the data related to ambulance demand and utilization during the four months the center was operational (July–October 2021).

## Report

### Background/Context

The central division of Fiji contains 43.5% of the population (385,557) and includes rural, urban, and semi-urban areas. It has four sub-divisional (small) hospitals, several small specialist facilities (a psychiatric hospital, a military hospital, an infectious diseases hospital, a birthing unit, a dialysis center, and a private hospital), and twelve health centers (clinics).

All patients requiring critical care and/or specialist care are referred to the national referral hospital in Suva, the Colonial War Memorial Hospital (CWMH).

Out-of-hospital care services are limited to the urban and semi-urban areas. There are three main ambulance providers: St John Ambulance, National Fire Authority, and Bula Ambulance. Access is by calling the ambulance provider directly, or via 911 which diverts to the nearest police station who can then transfer calls. The ambulance providers operate independently, which can result in them responding to the same call out. In the rural areas, including the mountainous interior of Fiji, people must find their own transport.

Fiji recorded its first case of COVID-19 in March 2020. Community transmission did not occur until April 2021 with the

virulent delta strain of the virus. This caused a large surge of cases in the central division that lasted until October 2021.

Public health measures included the lockdown of hotspot areas, a curfew, and restrictions on gatherings. Schools and workplaces were closed. Fiji's WHO-certified emergency medical team, the Fiji Medical Assistance Team (FEMAT), was activated in response to the surge in COVID-19 cases. The FEMAT set up a field hospital, a step-down facility, and the PHECCC.

### Structure and Functions of the PHECCC

The PHECCC provided medical advice, home assessment, and dispatch of ambulances, including coordination of inter-facility transport and retrieval of the critically ill. It was operational from July–October 2021. A similar unit was set up in the West of Fiji but is not described here. A toll-free helpline (165) allowed the public to access essential services and supplies, including access to emergency medical care. The structure of the PHECCC is described in terms of the WHO health system building blocks, adapted for the Pacific region, and used to describe the status of emergency care in the region in 2018.<sup>14</sup>

**Leadership and Governance**—The director of FEMAT was responsible for the PHECCC. Operational leadership was provided by the director of VFR Fiji and medical oversight was provided by the medical director; an emergency physician seconded to the PHECCC from the national referral hospital.

**Financing**—Financing was provided by the Fiji government and donors. Services were free at the point of access. Donors supplied ambulances, drugs, equipment, and personal protective equipment.

*Human Resources and Training*—The multi-agency workforce came from the Ministry of Health, Fiji Military, Navy, and Police Forces, Correctional Services, VFR Fiji, and St John Ambulance.

All staff attended training sessions on primary survey assessment, oxygen administration, patient packaging and transfer, communication, and infection prevention and control.

All ambulance responders were trained in Basic Life Support, use of automated defibrillators (AEDs), and basic trauma care.

*Infrastructure and Equipment*—The location of the PHECCC changed several times. Ambulances were provided by the agencies who supplied staff and were equipped to perform Basic Life Support interventions. When the crew included a medical officer, they brought additional equipment. The response capability was limited by staff availability rather than the number of ambulances and fluctuated as staff contracted COVID-19 and were required to isolate.

The call center was setup using a donated laptop and the assistance of a telecommunications company. Responders used donated radios and personal mobile phones to give situation reports and hospital notifications. Drugs were distributed by the government pharmacy. Equipment, consumables, and personal protective equipment were donated by local businesses and charities.

Once the surge period was over, the coordination of inter-facility transfers, retrievals moved to CWMH, and the coordination of prehospital care ceased.

*Processes*—The call-taking and assessment process is summarized in Figure 1.

After confirming that medical assistance was required, call takers collected demographic and location information, asked about symptoms, and documented any COVID-19 test results. Callers were then transferred to a medical officer. Potential or confirmed cases of COVID-19 without red flags were provided with advice and referred for follow up by the home isolation (public health) team. The medical officer determined whether a home assessment and/or ambulance transport were required, the urgency of response, and the crew composition (first responder, nurse, or doctor). Patients were assessed according to national COVID-19 clinical guidelines. Those who did not require hospital treatment were given the necessary medications and supplies to remain at home. Assessment findings were summarized and communicated to the PHECCC (when on scene) and receiving facilities (when en-route) using a standardized format.

Standard operating procedures were in use for:

- Referral to other services;
- Interfacility transport of COVID-19 positive patients;
- Care of the dead;
- Non-urgent patient transports;
- Transfer of COVID-19 positive patients to an isolation facility;
- Transfer of discharged patients to their residence; and
- Transport of materials or staff (samples to the lab, medical equipment and consumables, staff to undertake life-saving procedures).

*Data*—The PHECCC dataset included date and time of call, patient age, sex, location, time of ambulance dispatch, destination, and type of crew dispatched. Response times were not formally tracked or reported. The activity of the PHECCC is summarized in Figure 2.

During the four-month period, there were 3,095 calls. Of those, 451 were outside of the central division or non-urgent/non-clinical

Human Resources and Training	
Prehospital providers should undertake a basic training course with certification	p
A career pathway should exist for prehospital drivers and providers	✓
The staffing model should consist of a separate driver and care provider	✓
Basic training for emergency services personnel and community volunteers	p
Providers undertake short courses in Basic Life Support and primary trauma care	p
Infrastructure and Equipment	
Ambulances should carry a standard set of equipment	✓
Ambulances should be equipped with devices such as radios to enable communication with the dispatch center and health care facilities	✓
Ambulances should be fitted with a stretcher or trolley that can be safely secured	✓
Ambulances should carry a monitor and automated external defibrillator (AED)	✓
Leadership and Governance	
Nominated prehospital care clinical lead officially recognized by government	p
Processes	
A process to dispatch ambulances according to clinical priority	✓
A process by which the facility is notified of a critically ill or injured patient prior to arrival by ambulance	✓
Processes to ensure that patients are transported to facilities that can provide for their needs (eg, major trauma or burns)	✓
Data	
All calls to ambulance services must be logged and the time of dispatch must be recorded	✓

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**Table 1.** Pacific Regional Standards for Prehospital Care met by the PHECCC

Note: p = partially met; ✓ = met.

Abbreviation: PHECCC, Prehospital Emergency Care Coordination Center.

requests. A total of 2,644 cases were created, of which 1,668 (63%) were female and 976 (37%) were male. Overall, 291 (11%) were children (13 years and under), 1,692 (64%) were aged 14-59, and 661 (25%) were older adults (>59 years). Ten (0.4%) cases required phone advice only.

There were 2,634 ambulance responses. Of those, 66 (2.5%) were for deceased persons, 39 (1.5%) for emergency transport of equipment and personnel, 1,791 (68%) were responses to health facilities, and 738 (28.2%) were to houses. Of the 738 assessed at home, 303 (40.6%) were transported to hospital, 422 (56.6%) were referred for home follow up, eight (1.1%) remained at home against medical advice, nine (1.2%) were dead prior to arrival, and four (0.5%) had left for hospital prior to arrival of the ambulance. Thirty percent of total transports were “back transfers” from CWMH for patients who had recovered sufficiently to be managed in smaller facilities to make room for the seriously ill at CWMH.

**Discussion**

The PHECCC used a tier one system of first responders with medical triage and oversight and the ability to add a medical officer to the response when required. The system met or partly met many



of the prehospital care standards set by emergency care leaders in the region, as shown in Table 1. It featured a toll-free emergency access number, professional dispatch, ambulances equipped with AEDs, and interprofessional teams, as recommended by the International Liaison Committee On Resuscitation (ILCOR).<sup>15</sup> Only those requiring hospital care were transported and appropriate management was commenced in the prehospital phase. Clinical information was communicated in a structured way, informing hospitals of incoming patients prior to their arrival. There were many challenges including rapid training of staff, meeting demand for ambulances, and covering the roster as transmission rates soared and staff got sick. Many people spent protracted time away from their families, sleeping on base, and working long shifts with few days off. The system relied on donated ambulances and equipment, and staff were either seconded from their organizations or unpaid volunteers. Leaders had to be flexible and adapt to the rapidly changing environment, draft and refine processes as required, and interact with multiple stakeholders.

Many high-income countries are redesigning their prehospital care systems in response to rising demand and over-crowded emergency departments. The aim is to better integrate into health systems and provide more options for care delivery. Many countries have embraced virtual emergency departments, with emergency physicians directly advising patients, primary care practitioners, and paramedics.<sup>16,17</sup> The PHECCC embodied these concepts. So why was it dismantled once the surge in COVID-19 cases abated?

Barriers to formalized prehospital care systems in the literature include a lack of political will, lack of sustainable financing mechanisms, competing interests by existing ambulance providers, and use of ambulances by agencies and individuals to transport personnel and goods.<sup>18</sup> Once pandemic restrictions were lifted, the PHECCC staff returned to their respective agencies and the

doctors and nurses returned to their previous posts. The director of operations and other members of VFR Fiji were never remunerated for their services to the PHECCC. Medical direction and coordination of ambulance services according to clinical need was lost.

### Conclusion

In response to the COVID-19 surge in 2021, the Fiji government used a strengths-based approach and changed how health care was accessed and delivered. The prehospital and retrieval system that was created followed global recommendations, met regional standards, and provided the first dataset relating to ambulance demand and utilization. Unfortunately, this system was dismantled once the surge in cases abated and the country returned to normal business. In the emergency care system, human resources, training, infrastructure, equipment, and processes are like planets orbiting the powerful sun of leadership and governance and its companion moons: financing and data. Prehospital systems depend on political will, leadership and accountability, sustainable financing, and performance data. Disasters shine a spotlight on emergency care, and this can positively impact system development. This is the first article to document prehospital system development in the Pacific region. The hope is that it will assist policy makers with future planning, both in Fiji and elsewhere.

### Acknowledgements

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