VIEWPOINT

Pacific Voyages - Ships - Pacific Communities: A Framework for COVID-19 Prevention and Control

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US National COVID-19 data trends suggest that those living in rural areas, those who are Pacific Islander, Native Hawaiian, Black, Hispanic, and Native Americans suffer a disproportionate share, worse health outcomes, and higher mortality rates from COVID-19.[1,2]

With respect to Oceania, to date May 12, 2020, the US Affiliated Pacific Islands (USAPI) Guam and Commonwealth of the Northern Mariana Islands have reported COVID-19 cases, 152 and 19 respectively, and that their infection curves have flattened.[3,4] American Samoa, the Republic of Palau, the Federated States of Micronesia, and the Republic of the Marshall Islands report no cases to date.[5,6] French Polynesia reports 60, New Caledonia 18, and Tonga and the Cook Islands report no cases.[6,7] Are there Pacific relevant models to better understand how and why SARS-CoV-2 can affect Pacific communities? Two current Pacific voyages may be relevant in predicting the effects, the disparate outcomes, and needed response to the COVID-19 pandemic in Pacific Islander communities.

Voyage 1: USS Theodore Roosevelt

The USS Theodore Roosevelt, a US Navy Aircraft Carrier supporting a crew of about 4985, reported three of its crew COVID-19 positive on March 23, 2020. The carrier pulled into Guam's harbor on March 27, 2020 and was brought pier-side seven days later on April 3, 2020. At that time, 114 of the sailors tested positive for COVID-19, which was about one-third of the total number of the USS Roosevelt sailors who were tested. In anticipation of a medical surge related to the infection, the military built a tent hospital and would provide medical services for the crew who were quarantined in nearby hotels.[8,9]

By April 4, 2020, 4234 crew members had been shuttled ashore into housing on Naval Base Guam and hotels in the Tamuning and Tumon community districts for testing and two weeks of social isolation. Approximately 700 members remained on board to guard and disinfect the USS Roosevelt. These crew members who remained on board were then rotated ashore after three weeks and placed into community hotels for quarantine. A few of the 700 crew members later became COVID-19 positive.[8,9]

Eventually, 1102 of the Roosevelt's near 4985 crew members tested COVID-19 positive, including the Captain, resulting in more than 22 percent of the crew being infected within five weeks. The high rate of infection occurred in spite of attempts of off-the-ship social distancing and quarantine measures. About 40 of those with prior COVID-19, upon retesting, were found positive.[8-12]

Voyage 2: USS Kidd

A second naval vessel, the USS Kidd, a Naval Guided Missile Destroyer with a crew of 350, departed Hawai'i in late March. The Destroyer was detached from the Theodore Roosevelt Carrier Strike Group while the USS Theodore Roosevelt was pier-side in Guam with the COVID-19 outbreak.[13,14]

During the third week of April, a month later, a COVID-19 outbreak occurred while the ship was working off the Pacific coast of South America. A crew member displayed symptoms of an "influenza-like illness" on April 22, and was subsequently evacuated off the ship to a military hospital in San Antonio, Texas. On April 23, the sailor tested positive for COVID-19. The entire crew had not been ashore since their Hawai'i visit in mid-March 2020. That positive test began a two-month process to rid the deployed ships of the SARS-CoV-2 virus.[12,13,15,16]

The USS Kidd pulled into San Diego on Tuesday, April 28 to begin disinfecting the ship, as well as isolating, testing, and treating the crew. At least 78 members of the Kidd's crew of about 300 tested positive to COVID-19, according to the last figures released by the Navy on April 30, 2020. At least 25 percent of the crew of the USS Kidd were infected.[14,17]

As of the latest available reports, 26 naval vessels have had COVID-19 outbreaks. There were 1,366 current COVID-19 cases, as of early May 2020.[18]

A Framework for Understanding COVID-19

COVID-19 (the disease) is caused by the SARS-CoV-2 (the virus). It has been found to transmit rapidly between humans. The risk for transmission between humans is enhanced by particular environmental attributes such as crowding which increases the frequency and duration of contact with infected individuals or contaminated environments.[19]

Individual health outcomes from COVID-19 are associated with: (a) personal health (eg, age, immune status, and underlying conditions including hypertension, heart disease, diabetes, asthma and other lung conditions, pregnancy, and smoking); and (b) access to appropriate medical support if required (eg, supportive hospital care and ventilators).[19,20]

Community health outcomes from COVID-19 are associated with: (a) the built environment (eg, density of population and homes); (b) population and demographic factors [age distribution and rates of the co-morbid conditions (listed earlier)]; (c) access to supportive medical care (health infrastructure and the ability to access the health infrastructure); and (d) the ability of the community to prevent and manage the COVID-19 disease through organization, social-cultural attributes, health literacy, and financial assets.[20,21]

A COVID-19 Ship Framework for Pacific Islander Communities

The USS Theodore Roosevelt and USS Kidd provides real time, Pacific relevant examples of the nature of COVID-19 within crowded living conditions, highly interdependent communities, with limited health infrastructure services, limited group capacity to manage their personal situation, and an impossible environment to maintain social distancing.

Many of the Pacific Island communities have similar situations with densely populated communities, highly culturally interdependent communities, limited access to adequate health infrastructure, limited resources for the group to affect disease transmission, and living environments not conducive to social distancing should COVID-19 surge. Several examples are Ebeye Island where 11,000 people live on 66 acres, Majuro atoll with 20,000 people, Tarawa the capitol of Kiribati supports 45,000 citizens, and a high density of Moen, Chuuk.[22-25] Pacific Islander communities within the US or its territories with large extended families in single dwelling homes or in low-income housing settings, poor access to health care, and little possibility for social distancing face the same issue.[2,5] Recognizing, interpreting, and describing the disparate effects of the COVID-19 pandemic on the Pacific Island communities sets the stage for what must be done quickly and precisely in context of the Pacific Island communities.

Perhaps the story of COVID-19 aboard the USS Theodore Roosevelt and the USS Kidd during their recent Pacific tours may help Pacific communities and small Pacific Island nations anticipate what may unfold, and what is needed if COVID-19 enters their communities. The USS Roosevelt and the USS Kidd crews live and work in close proximity, confined by livable space and the structure of the ship.[17] The crew members, like many Pacific Islander communities, must be tightly interdependent to manage the ship. They live in close quarters and are in close and frequent physical contact.

As a part of a large Naval ship, the sailors cannot physically exit or meaningfully isolate themselves as they are surrounded by the ocean, by the bulkheads, and clearly bound by the naval culture and rules of the mission.[17] When COVID-19 presented to each of the vessels, the virus spread very quickly. From 0 to 114 to 1102, over 22 percent of the 4985 crew were infected within five weeks, including two dozen hospitalizations, and one death.[8-12] The mission and work of the USS Roosevelt and the USS Kidd came to a grinding halt with the advent of the infection. Would a similar scenario unfold in small Pacific Island nations or in tightly knit Pacific Island communities, which are culturally and environmentally limited in options? Notably, a few cases of COVID-19 may bring a Pacific community to a grinding halt and functionally inoperable.

The USS Roosevelt command and the US Navy recognized the immediate need to address COVID-19 isolation, social distancing, and a potential surge of illness. The 4.5 billion dollar aircraft carrier could not handle these protective and anticipatory COVID-19 measures on its own. The Captain and crew, and indeed the US Navy, sought the support of the Guam community. They sought shelter for over 4234 crew members in Guam hotels and the community to isolate them, protect them and to manage the spread of the illness. Concurrently, the Air Force built a 75 bed medical units on the Naval Base and the Navy and Marines built a 150 bed field hospital on the Department of Defense property to support a potential COVID-surge.[26,27]

COVID-19 transmission was rampant on a 4.5-billion-dollar aircraft carrier. The access to financial and strategic resources was not the problem. The physical structure of the ship, the ships isolation in the middle of the ocean, and the lack of on-site medical support was problematic. Wisely, they did and could move their entire ship's community to Guam. Where would the people of small island nations or communities go to protect their own? How would they gear up for a COVID-19 surge with limited resources, lack of housing infrastructure, health resource shortages, and lack of transportation from their distant outer island communities hundreds of miles away? The islands and Pacific Islander communities cannot move.

There was only one death in the crew of the USS Roosevelt.[8] They were blessed. Of significance, the sailors of the USS Roosevelt and USS Kidd were generally young, healthy sailors. In many of the Pacific communities, the affected would be the elderly and Pacific Islanders with hypertension, diabetes, and heart disease. In the Pacific Island communities, unlike young healthy sailors, the individual health outcomes would be significant from COVID-19.

In theory, the USS Roosevelt and the USS Kidd could replace its sick crew. The island nations and communities do not have the option to replace their crew nor can they sail to safe harbor. Using the Naval ship model, we can visualize how and why Pacific Islander communities, especially those with limited

resources, needing health infrastructure, with dense living environments, are at great risk for rapid spread, high mortality, and unmanageable illness. A significant outbreak could lead to closure of function of that community or island nation. The analogous model of the USS Roosevelt and USS Kidd suggest this would be the case. The structural, economic, planning and global support that is required to assist, manage, and prevent the disparate effect on Pacific Island communities by COVID-19 comes into focus.

Ships, like island nations or small Pacific Islander communities within the US, cannot remain isolated forever. They cannot close off from the world due to trade, citizen travel, students, and indeed their economies. There have already been 26 Naval vessels infected,[18] and other entertainment, fishing and commercial vessels. As the world "opens up" again, every community or island nation should take into account how it is unique and how each should determine what is scientifically, culturally, economically appropriate as a COVID-19 response. Opening up for one country may be correct, but a disaster for another. Further, the actions of one country or community opening or closing will impact the global community.

We all need to pay attention - as the COVID-19 pandemic with the Pacific Island nations and peoples will unwind and declare itself in the upcoming weeks to months. What has been learned from the USS Roosevelt, USS Kidd, and a total of 26 Naval ships, cruise ships, fishing vessels, and cargo ships which were not allowed to land in any port is important to internalize and anticipate.

Prevention strategies that do not allow the coronavirus to take hold in remote communities are essential. Culturally appropriate distancing, developing a plan to provide quarantine and isolation, ensuring access to appropriate medical care, and other efforts to protect elders and vulnerable people should be prioritized and shared. Once a vaccine is available, specific campaigns should be stood up to promote herd immunity.

The COVID-19 narrative of the USS Roosevelt and the USS Kidd is not over. It is the beginning. The Pacific should pay attention to the outcomes and processes that affected the USS Theodore Roosevelt and the USS Kidd. Global institutions should be prepared. The Global health community, the US government, the Pacific nations, must together work proactively to prevent and manage disparate COVID-19 outcomes in Pacific communities. There is no other way.

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