

Hemodialysis in the Compact Nations of the US Affiliated Pacific: History and Health Care Implications

Margaret S. Min BA; Arnold W. Siemsen MD; Emi Chutaro MSc; James E. Musgrave MD; Ramona L. Wong MD; and Neal A. Palafox MD, MPH

Abstract

Background: The epidemic of non-communicable disease in the Compact nations of the US Affiliated Pacific Islands and the associated renal complications drive the demand for hemodialysis. Limited healthcare budgets and a lack of trained human health resources in these areas make hemodialysis a challenging undertaking that may require significant sacrifices in competing health care priorities.

Methods: Two nephrologists who developed hemodialysis in the US Affiliated Pacific Islands provide its history. Cost estimates of hemodialysis for the Compact nations are collected from a 2014 hemodialysis feasibility report. The experiences and outcomes of current hemodialysis centers in the United States and other island nations provide a framework by which to assess the potential benefit and impact of hemodialysis in the Compact nations.

Discussion: A consideration of how and why different stakeholders value hemodialysis will be crucial because they will drive the public's response to the institutionalization of any new intervention or the cessation of any existing intervention like hemodialysis.

Conclusion: Updated cost estimates for dialysis clinics and data on renal disease rates in the Compact nations will be necessary to make informed decisions about hemodialysis in the current health systems. In the meantime, it is essential to enhance current medical interventions and public health strategies to prevent kidney disease and decrease the risks for kidney failure. Such preventive interventions must be culturally appropriate, effective, cost-efficient, and sustainable in the unique context of the Pacific.

Introduction

The Story of a Marshallese Dialysis Patient and Dr. Arnold Siemsen's Inspiration (A. Siemsen, personal communication, June 2019)

On April 25, 1972, Dr. Arnold Siemsen received a call from the United States Pacific Trust Territory Liaison Officer that a girl from the Marshall Islands would arrive in 3 hours on Air Micronesia. Dr. Siemsen, as the director of the Hemodialysis Center of St Francis Medical Center in Honolulu, Hawai'i, admitted her for treatment.

The 13 year old girl, named Amjur, arrived with her family. She was treated for more than 2 years until July 4, 1974, at which point she and her family wished to go back to their island home in the Marshall Islands. Furthermore, the hospital administration at St Francis noted that the payments for Amjur's hemodialysis, to be covered by the Marshallese government, were delayed.

Dr. Siemsen discussed alternatives with Dr. Masao Kumangai, who at the time was the Trust Territory Director of Health

Services. After months of correspondence, it was jointly decided that Dr. Siemsen would go to Majuro, the capital of the Marshall Islands, to make recommendations to set up a self-care hemodialysis unit at Majuro Hospital. Upon arrival, Dr. Siemsen drew up a plan, including the placement of electrical outlets, water outlets, and drains, a list of supplies to purchase, and the recruitment of a seasoned Marshallese nurse, Hemiko, who would be trained to administer hemodialysis.

Dr. Siemsen oversaw the training of both Hemiko, the Marshall Islands graduate nurse, and Amjur, the patient. Within months, self-care hemodialysis was started in Majuro. Whenever complications arose, Amjur and other dialysis patients were transferred back to Honolulu for treatment via Air Micronesia. Dr. Siemsen continued to visit the Majuro dialysis unit approximately every 4 months. Over the next decade, Dr. Siemsen and his staff were able to train several more dialysis nurse technicians, Jordan, Christina, and Caleb; 3 dialysis machines were operational and 17 new hemodialysis patients were undergoing treatment in the Marshall Islands.

The Marshall Islands dialysis clinic, although technically robust with trained staff, struggled to maintain supplies, medications, and regular staffing. The finances of the Marshall Islands health services were stretched between many health priorities and heavy disease burdens. Dialysis patients began missing their dialysis treatments which resulted in preventable complications. Equipment fell into disrepair and the dialysis machines could not be maintained to appropriate standards. In 1986, the Primary Health Care Act was instituted in the Marshall Islands, closing the dialysis clinic.

What is COFA?

The Republic of the Marshall Islands (RMI) is one of six United States Affiliated Pacific Islands (USAPI) in the Western Pacific. Three of the USAPI, including the RMI, are freely associated with the United States (US) under a Compact of Free Association (COFA) and are referred to as "COFA nations" or "Compact nations" in this paper. The other two COFA nations are the Republic of Palau (Palau) and the Federated States of Micronesia (FSM).

The COFA nations are geographically dispersed and isolated countries. The FSM and the RMI are considered low-middle income countries while Palau is now considered a high-income

country due in part to its eco-tourism, proximity to Asia, natural ocean environment, and its world-class diving and fishing industry. Under COFA, the COFA nations allow the US government to have military oversight and strategic denial of access to land, air, and ocean in these countries. In exchange, the COFA nations receive federal assistance and political benefits from the US government. The citizens of the COFA nations are allowed to migrate to and work in the US without visas or time restrictions. Many travel to the US to seek greater educational opportunities, work, and medical treatment such as hemodialysis.^{1,2}

Background on Hemodialysis and End-stage Renal Disease

Hemodialysis is a renal replacement therapy often used at the last stage of chronic renal disease, known as end-stage renal disease (ESRD) or kidney failure. Hemodialysis replaces defunct kidney function by filtering blood externally via a dialysis machine; the blood exits the body and passes through a dialyzer, which filters out waste products and excess fluids, and then the blood returns to the body. Treatment is usually done in an outpatient setting 2-3 times a week for several hours at a time and is required for the rest of a patient's life or until a kidney transplant is available.

Vascular access is necessary for hemodialysis. The preferred access type is an arteriovenous (AV) fistula because it is the least likely to become infected, lasts the longest, and provides high blood flow. An AV fistula is placed by a vascular surgeon and takes 2-3 months to mature before it can be used for hemodialysis. Therefore, chronic renal disease patients must be monitored for renal function leading up to kidney failure and prepared before hemodialysis is needed.

There are two common alternative renal replacement therapies used to treat ESRD, but neither is being pursued in the COFA nations or the US Pacific Territories. One is kidney transplant surgery, which, when successful, restores renal filtration and eliminates the need for regular dialysis treatments. Though kidney transplant surgery has these benefits and even has lower costs than hemodialysis in the US, it is not feasible in the COFA nations because of the robust hospital infrastructure, resources, and personnel that is required for such a complex procedure.^{1,3} Additionally, the potential complications of a transplant, including infection and kidney rejection, would require support from a highly developed medical system. For now, it would be difficult for the hospitals in the COFA nations to support such demands.¹ Furthermore, there is a shortage of donor kidneys in the United States with a median waiting time of 3.6 years as of 2011, and therefore would likely not be a solution for all ESRD patients in the COFA nations.³

An alternative is peritoneal dialysis, which makes use of the patient's abdominal lining (peritoneum) to filter body fluids internally. Peritoneal dialysis has the benefit of home use without either a hemodialysis machine or placement of vascular access.

However, there is a high risk of infection if replacement of the exchange fluid is not done in a sterile environment by meticulous patients. A ready supply of medications to treat infections promptly is a necessity.⁴ In some Micronesian cultures, an extended family may share a small living area with limited running water and bathroom facilities, and household members may have minimal health literacy regarding peritoneal dialysis, making the risk of infection significant and peritoneal dialysis inappropriate for use.² Furthermore, the geographic isolation and limited medical inventories of the COFA nations preclude a reliable and accessible local supply of medications, including the required dialysate solution which must be changed 4-6 times daily.¹

Hemodialysis in COFA Nations

After Dr. Siemsen established self-care hemodialysis machines in the Marshall Islands, he subsequently developed dialysis units in the other COFA nations, including Pohnpei State of the FSM and Palau. Both of these clinics have been operating intermittently since and are currently in use. The dialysis facility in the RMI has not reopened since its closure by the 1986 Primary Health Care Act.

Hemodialysis is a contentious topic in the COFA nations in part because the Compact of Free Association will expire in 2023 for the FSM and the RMI. Financial assistance from the US federal government will be replaced with trust funds, and the state of healthcare funding will likely change dramatically, making the discussion of hemodialysis time-sensitive and crucial.

The need for hemodialysis is intensified by the crisis of non-communicable diseases (NCD) that has led the region to declare a state of emergency.⁵ The health profiles of the USAPI, particularly the COFA nations, have been associated with the introduction of Western processed foods and a rapid transition to more sedentary lifestyles over the last 70 years. Environmental degradation and inadequate nutrition has been further complicated in the RMI due to 12 years of US nuclear weapons testing, which destroyed ancestral lands and displaced residents, leading many to rely on processed foods after the growing of traditional foods became unfeasible.^{1,2,6} In Pohnpei State of the FSM, 73.1% of adults are overweight or obese.⁷ Rates of hypertension and diabetes are also high; in Yap State of the FSM, 35% of the adult population have hypertension; in Palau, diabetes is estimated at 17.9% of the adult population; in the RMI, diabetes is estimated at 32.9% of the adult population.^{8,9} Obesity, hypertension, and diabetes are risk factors for many chronic diseases including ESRD, the focus of this study.¹⁰

In the US the prognosis for dialysis patients depends on many factors but is significantly worse than the general US population. In the general population, a 60-year-old will on average live 20 more years while a dialysis patient aged 60 years can expect to live for less than 6 years. Five-year survival rate specifically for hemodialysis patients in the US was 42% in 2011.³ While

dialysis services can prolong life for some years, it is also important to recognize that it does not restore the same quality of life or life expectancy as a healthy individual.

Dialysis patients with comorbidities have worse prognoses. For example, diabetes can both cause ESRD and significantly impact the survival rate of ESRD patients once they start dialysis. A study of more than 7000 patients in northwest Italy demonstrated that dialysis patients with type 2 diabetes had a significantly higher 5-year mortality rate than non-diabetic dialysis patients (71% versus 53%).¹¹ In the US, the 5-year mortality rate for dialysis patients is 65%, but 75% for dialysis patients who also have diabetes.¹² The limited benefit of dialysis for patients with comorbidities such as diabetes is important to consider especially in the Pacific region where such comorbidities are highly prevalent.⁵

The object of this study is to analyze the cost-effectiveness of sustaining existing hemodialysis services in Palau and Pohnpei State and commencing hemodialysis services in other parts of the COFA states. The benefits of dialysis are considered in terms of survival and quality of life.

Methods

Some cost data were collected from an unpublished feasibility study that was completed in 2014 under the direction of the Pacific Island Health Officers Association (PIHOA). This data include cost estimates and predictions of dialysis services in the COFA nations.

Other more recent information was obtained through correspondence with healthcare providers and public officials from the US and the COFA nations.

Much of the collected information was aggregated in the context of COFA histories and the current NCD crisis.

Results

As specified by health officials in the COFA nations, there are only two clinics offering dialysis services as of 2019, one at Pohnpei State Hospital of the FSM and another at Belau National Hospital in Palau. There are 6 dialysis machines in Pohnpei, though only one is in operation at present. There are 7 dialysis machines in Palau serving ESRD patients and one machine serving hepatitis B patients. Chuuk State, Kosrae State, and Yap State of the FSM do not have any dialysis machines.

According to the feasibility study by PIHOA, in 2013, the numbers of patients undergoing dialysis treatment were as follows: 32 in Koror, Palau and 12 in Pohnpei, FSM. There were expected increases in 2014 to 35 patients in Palau and 13 in Pohnpei, which would constitute 0.17% and 0.04% of the populations, respectively.

In the sites that do not provide dialysis services, the estimated number of patients in need of dialysis by 2014 were as follows: 41 in Chuuk, FSM; 8 in Kosrae, FSM; and 61 in Majuro, RMI. They would constitute 0.08%, 0.10%, and 0.11% of the population, respectively. Estimates for Yap State, FSM were unavailable in the feasibility study. However, according to health officials, as of 2019, Yap State does not provide dialysis services but approximately 6 dialysis patients from Yap are cared for in Palau.

In Palau, the total annual cost to serve an expected 35 patients in 2014 was \$1,483,055, which would have accounted for 9.89% of the national healthcare budget. In Pohnpei, FSM, the total annual cost to serve an expected 13 patients in 2014 was \$360,968, which would have accounted for 4.51% of the healthcare budget. In the other sites without running dialysis units, startup costs would be high. To meet expected need in 2014, Chuuk State of the FSM, Kosrae State of the FSM, and Majuro of the RMI would have had to spend 14.40%, 15.45%, and 7.95% of their respective healthcare budgets in the first year to establish dialysis services.

Discussion

Capacity to Support ESRD-related Incidental and Unexpected Care for Patients on Dialysis

The typical ESRD dialysis patient requires extensive medical care beyond hemodialysis for the rest of their life. In Kosrae of the FSM for example, the projected cost to serve its hemodialysis patients (0.10% of the population) would be 15.45% of their healthcare budget. This figure excludes any incidental costs like hospitalizations for complications, but it is likely that many patients would need unexpected interventions. In the US for example, inpatient care accounts for 33% of Medicare spending for patients with ESRD, and dialysis patients averaged 1.7 hospital admissions in 2016 with a 30-day readmission rate of 35.4%.³ If such unexpected costs were included in the expense calculations for the COFA states, the costs to treat ESRD patients relative to the total healthcare budget would likely exceed that what has been cited in this paper (ie, greater than the 15.45% referenced in this paper for Kosrae).

Because of the lack of data in the Pacific, it is difficult to quantify precisely the costs associated with both hemodialysis and ESRD in general. However, the cost estimates stated in this paper are a starting point.

Capacity to Address the Complications of Common Comorbidities in COFA: NCDs and Infectious Diseases

Comorbidities negatively affect longevity for ESRD dialysis patients. The rapid rise of NCDs in the USAPI has moved to a critical juncture and in 2010, a Regional State of Health Emergency was declared due to an epidemic of NCDs.⁵ As obesity, hypertension, and diabetes are risk factors for ESRD and are

all highly prevalent in the COFA nations, it is likely that many ESRD patients in the COFA nations have such comorbidities, none of which are treated directly through hemodialysis.⁷⁻¹⁰ Conditions like diabetes complicate dialysis treatment and may require costly interventions to mitigate, with an overall worse prognosis.^{11,13,14}

The COFA nations are concurrently battling infectious diseases like tuberculosis (TB). Dialysis patients are at a higher risk of contracting TB in part due to their immunocompromised state.¹⁵⁻¹⁷ In the RMI, the incidence rate of TB was reported at 480 cases per 100,000 people in 2017 (compared to 2.7 cases per 100,000 people in the US in 2019), which means dialysis patients would be at an increased risk of contracting TB than they would be elsewhere with fewer TB cases.^{18,19} Dialysis patients who do contract TB may suffer adverse effects from anti-TB treatment. In one study, only 53.1% of dialysis patients with TB completed TB treatment and recovered.²⁰ Another study cited a 36.8% mortality rate within 6 months of TB treatment initiation.²¹

A Consideration of the Cost Efficiency of Hemodialysis

The principal cost of providing dialysis is high (eg, 9.89% of the healthcare budget in Palau) and thus unfeasible in some COFA nations without sacrifices in other branches of healthcare or the government in general. Furthermore, in light of other complications like the estimated incidental costs of treating ESRD (eg, hospitalizations), the current NCD epidemic in the region, and the current struggle with communicable diseases like TB, the cost of providing dialysis is likely even higher than the approximations provided in this paper. Even more importantly, given the ongoing health disparities in the COFA nations, the poorer prognoses for COFA patients who are on dialysis might tip the scale such that providing dialysis is not a cost-effective measure for promoting health and longevity in the COFA nations.

How Do Other Countries Do It? Three Case Studies of Treating ESRD in Different Contexts

1. United States (large healthcare budget)

A high-income country like the United States provides dialysis services but still at a high cost. In the US in 2015, ESRD afflicted less than 1% of the Medicare population yet accounted for 7.2% of Medicare paid claims in 2015.³ (Though this figure includes kidney transplants, peritoneal dialysis, and other costs like hospitalizations and emergency visits.) However, with the highest gross domestic product (GDP) in the world and national health expenditures at \$10,739 per person, the US is able to provide a costly service like dialysis at lesser sacrifice to other medical care.²² In contrast, Palau, the wealthiest of the COFA nations with the highest GDP per capita, spent \$1,429 on health per capita in 2014.²³⁻²⁵ However, it should be noted that in Palau,

the government subsidizes the dialysis unit \$500,000 annually to sustain this effort. In the FSM, which is more resource-limited than Palau, the health expenditure per capita in 2014 was \$473.²⁴ In the COFA states, dialysis services require (or would require) a very large proportion of a very limited health care budget.

2. US Territories (financial support from a larger country)

Dr. James Musgrave, a Hawai'i-based nephrologist, partnered with Dr. Siemsen to open a dialysis clinic in American Samoa in August of 1980. Because American Samoa is a US territory, this clinic is supported by Medicare. Dr. Siemsen retired in 1985 and Dr. Musgrave continued running the American Samoa clinic with other colleagues. While there is no vascular surgeon onsite, a surgeon from the Philippines was taught to do simple fistulas by a visiting vascular surgeon and so almost 90% of dialysis patients have AV fistulas. Similar to the COFA nations, most patients have either diabetes or hypertension or both, which complicates treatment with an estimated yearly mortality rate of 12%. Nevertheless, the clinic is continually expanding with an adjusted annual growth of 5.5% and currently has 32 dialysis machines for 170 patients. Without Medicare support, this clinic would not be sustainable in meeting current or future demand (J. Musgrave, personal communication, March 2019).

The other US territories of Guam and the Commonwealth of the Northern Mariana Islands also provide dialysis services to their residents, but similarly do so only through Medicare funding. Because the COFA nations are only freely associated with the US and are not territories, they do not receive Medicare support. Therefore, any dialysis intervention in a COFA nation would need to be self-sustaining.

3. Two South Pacific Nations (treatment provided within a larger, affiliated country)

In comparison, in small island nations of the South Pacific, such as the Cook Islands and Tokelau, there are no dialysis services offered. Instead, these nations rely on their affiliations with New Zealand to access renal care. As dialysis is a life-prolonging measure, this arrangement is less than ideal because it requires a patient to move permanently to New Zealand. Similarly, residents of COFA states are able to access dialysis services in the US, though understandably, many would prefer to access dialysis in their home countries.

A Prevention-based Approach for the COFA Nations

With these complexities of providing dialysis in mind, it would be essential to consider alternative approaches to ESRD in the COFA nations, such as strengthened NCD prevention programs and more robust glomerular filtration rate (GFR) tracking of individuals at high risk of ESRD. A small quality improvement study on the impact of Aloha Kidney, a comprehensive series of classes educating patients on kidney health and self-management

of chronic kidney disease, was conducted in Hawai'i. Dr. Ramona Wong retired from her nephrology practice to provide the classes in person and via telehealth to neighboring islands. The results of this study suggest that education can slow kidney function decline and improve preparedness for the transition to ESRD (R. Wong, email communication, March 2020). Looking forward, enhancing preventive healthcare measures may reduce the occurrence of ESRD and more importantly, improve the general health of COFA populations. Such a prevention-based approach is moving forward but has not yet been emphasized among public health officials and community members as a needed and evidence-based strategy to prevent and slow renal failure.

Perspectives of Public Officials and Community Members

1. US Congress

In a letter to the US Secretary of State and Secretary of the Interior, members of the US Congress expressed concern with the rising costs of the Compact Impact. The Compact Impact describes the effects of the Compact of Free Association, which in part allows COFA residents to migrate, live, and work in the US without a visa or time limits. In this letter, COFA migrants' increasing reliance on social services in the US is cited as a major factor for the financial burden in question. It was recommended that an allocation of a portion of the Compact grant assistance, specifically, the Infrastructure Sector and Health Sector grant, be used to establish and operate dialysis facilities in the FSM and the RMI. This recommendation was made with the explicit intention of mitigating migration of COFA residents seeking ESRD healthcare in the US (L. Murkowski, et al, written communication, May 12, 2011). However, this Congressional idea ultimately could not be carried out because local health officials recognized that this intervention would not be sustainable and would utilize health funds from other areas of higher priority such as diabetes, heart disease, and cancer prevention and control.

2. Community Members: A Consideration of Human Values

At least anecdotally, community members support the provision of dialysis services in the COFA nations, which could be explained in several ways. One possibility is skepticism over how resources will be redirected upon closure of dialysis services. It is difficult to discern whether the funds saved would be used toward NCD prevention or toward financing other interests in the public sector. Such ambiguity might make community members less comfortable with forgoing dialysis as it is unclear what the return would be, if any at all.²⁶

A second explanation regards the symbolic value of dialysis as a life-prolonging intervention. While many people might regard life as priceless, there are many governmental policies that are ultimately detrimental to the public's health. That said, the provision of hemodialysis is symbolic in the public's eyes as

a unique demonstration that everything will be done to prevent death, even if early prevention measures would be ultimately more effective. In this way, hemodialysis services provide a false sense of security.²⁶

Third, while the lack of NCD prevention programs will lead to premature death, so will the lack of hemodialysis. The latter is more clearly the direct cause of death. For example, if an ESRD patient dies, "kidney failure" will likely be deemed as the cause of death rather than "lack of access to hypertension or diabetes prevention programs". The former can thus be perceived as of grave concern while the latter is more of an unfortunate detail.²⁶ In order to begin prioritizing prevention programs, there needs to be some reconciliation of this tendency to undervalue the potential benefits of early intervention.

Fourth, in Palau and Pohnpei, dialysis services are currently available, and patients who have been receiving treatment for years may have a reasonable expectation that these services will continue. For those current patients, the closing of clinics may be viewed as an especial betrayal by the health system.²⁶ Therefore, it would be worthwhile to discuss how to continue treatment for current patients amidst phasing out dialysis more broadly.

A consideration of how and why people value dialysis will be crucial because they will drive the public's response to the institution of any new intervention and the cessation of any existing intervention (ie, hemodialysis). Despite these complexities, hemodialysis, as a limited resource in the COFA nations, must be at the forefront of current healthcare discussions. COFA communities are approaching (or have already arrived at) the difficult moral situation of deciding who gets access to the limited hemodialysis. There is already a precedent for this in the genesis of hemodialysis in the 1960s. It is imperative that COFA communities proactively engage in strategic planning to address the need and impact of hemodialysis for their nation.

God Panels: A Cautionary Tale

At the advent of dialysis in the US in the 1960s, dialysis treatment was limited and could not meet the existing demand. In response, special hospital committees, "God panels", were instituted to determine which patients would receive dialysis treatment based on a patient's determined social worth.²⁷ Understandably, such subjective determinations were condemned as discriminatory by bioethicists.^{28,29} The ESRD program was instituted in 1972 to mitigate any future need for God panels by providing widespread, federally funded dialysis treatment to all US citizens with ESRD.^{27,30}

In the COFA nations, where it is not financially feasible to expand the current dialysis clinics to meet the increasing demand, the God panels of the 1960s serve as a cautionary tale of the difficult decisions that lie ahead. Though such decisions might

not be based on patients' social worth, referral decisions based on prognosis are already being made in the Pacific. To ensure the most ethical and effective approach to treating ESRD, a discussion of the future of hemodialysis (or lack thereof) among healthcare providers, public health officials, and the public is essential. Alternatives must be considered.

Conclusion

The utility of hemodialysis, the determination of its value, and its place in a health care system is a function of medical necessity, resource priorities, and the values and perspectives of the stakeholders. As an example, from a US-centric point of view, the establishment of hemodialysis in the COFA nations may be beneficial to the States and Territories as it would mitigate the need for COFA residents to migrate to receive dialysis. However, from a COFA-nation centric point of view, establishing hemodialysis may not have an overall net benefit because resources are generally limited, hemodialysis may detract from other more pressing local health care priorities, and hemodialysis may not be a sustainable health intervention. In the US Pacific Territories, Medicare funding supports hemodialysis treatments which decreases the local financial burden. Nevertheless, the infrastructure needed for hemodialysis in the Territories may still stretch health human resource capacities. Understanding the perspectives and priorities of stakeholders and managing individual biases may be helpful in evaluating the impact of hemodialysis in the COFA populations.

Hemodialysis has increased the life expectancy and quality of life for many. However, the average longevity for a patient on dialysis is still significantly limited and even shorter for patients with comorbidities. Also, medical complications while preparing patients for dialysis and during the course of dialysis treatments are not uncommon and significantly impact quality of life. The local authors of health policy and the public's expectations of hemodialysis may further benefit by reviewing the evidence, outcomes, and experiences of dialysis centers across the globe.

With these variables in mind, cost data indicate that hemodialysis is likely not cost-effective in most of the COFA areas. Therefore, alternatives to treating ESRD must be developed that are both community-specific and resource-appropriate. With the unique disparities of this region, each community will likely require unique solutions. The positive results of the Aloha Kidney program suggest that education is an important tool in managing chronic kidney disease and kidney health is relevant to health educational programs in the COFA nations. If additional support for such programs is needed, telemedicine can be a useful method of providing knowledge to both healthcare professionals and patients while local capacity is developed to sustain educational and outreach efforts independently.

Data on current cost estimates of dialysis clinics and ESRD rates in the COFA communities will be essential to make informed decisions about hemodialysis in the current health systems and as these systems plan for the future. It is essential to enhance current medical interventions and public health strategies to prevent kidney disease and decrease the risks for kidney failure in the COFA nations and all the USAPI. Such preventive interventions must be culturally appropriate, effective, cost-efficient, and sustainable in the unique context of the Pacific.

Conflict of Interest

None of the authors identify any conflict of interest.

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Authors Affiliations:

- Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai'i, Honolulu, HI (MSM, NAP)
- St. Francis Medical Center, Renal Institute of the Pacific, Honolulu, HI (AWS)
- Department of Medicine, John A. Burns School of Medicine, University of Hawai'i, Honolulu, HI (AWS)
- Pacific Island Health Officers Association, Honolulu, HI (EC)
- Department of Pediatrics, John A. Burns School of Medicine, University of Hawai'i, Honolulu, HI (JEM)
- Aloha Kidney, Honolulu, HI (RLW)

Correspondence to:

Neal Palafox MD, MPH; Department of Family Medicine and Community Health, John A. Burns School of Medicine, University of Hawai'i, 651 Ilalo Street MEB224, Honolulu, HI 96813; Email: npalafox@hawaii.edu

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