



CKD in Native Hawaiians and Pacific Islanders

Trouble in Paradise

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CJASN 14: 1661–1663, 2019. doi: <https://doi.org/10.2215/CJN.03260319>

Introduction

Thousands of years before Europeans reached the Pacific Ocean, Pacific peoples were settling islands scattered throughout Earth's largest ocean. Using navigational techniques developed over generations of studying wind, wave, and ocean current patterns and the behavior of birds and memorizing celestial positions at different latitudes, indigenous navigators found their way among tiny islands in a 60-million square mile ocean. Migrations brought people to New Guinea, Solomon Islands, Vanuatu, Fiji, Palau, Guam, Marshall Islands, Samoa, Tahiti, Hawai'i, Rapa Nui (Easter Island), Aotearoa (New Zealand), and many other islands in the Pacific.

Colonial ambitions brought foreigners from the United States, Russia, France, England, and elsewhere into the Pacific. Exposure to foreign diseases, resource exploitation, war between non-Pacific nations, and nuclear testing changed the Pacific and the lives of its inhabitants. The United States ultimately dominated the northern Pacific. Hawai'i was annexed by the United States in 1898 and became a state in 1959. Guam, American Samoa, and the Northern Mariana Islands are United States territories. Three independent nations (Palau, Republic of the Marshall Islands, and Federated States of Micronesia) are freely associated states of the United States. The Compact of Free Association (COFA) provides financial support to these nations, allows the United States military to operate in their regions, and permits citizens of these nations to live and work in the United States as lawfully present migrants and even serve in the United States armed forces.

Native Hawaiians and Pacific Islanders in the United States

The term Native Hawaiians and other Pacific Islanders (NHPs) is used by the Office of Management and Budget (OMB) to refer to individuals with origins in any of the original peoples of Hawai'i, Guam, Samoa, or other Pacific Islands. Approximately 1.3 million NHPs reside in the United States (0.4% of the total population), and 370,000 (28%) reside in Hawai'i (1). Other states with a significant NHP population include California, Oregon, Washington, Nevada, Utah, Texas, and Florida (1). Despite the low proportion, the NHP population increased 40% from

2000 to 2010 (2). As in other minority populations, the socioeconomic disparities experienced by NHPs are significant. Nearly 20% live at the poverty level (versus 10% of whites), only 20% have a college degree (versus 34% of whites), and 7.8% had no health insurance in 2015 (versus 6.3% of whites) (1).

Kidney Disease Is a Critical Health Problem among Native Hawaiians and Pacific Islanders

Before 1997, NHPs and Asian Americans were classified by the OMB as one race group. This made it difficult to ascertain the burden of health comorbidities among NHPs. Although intuitions were that NHPs had high rates of obesity, diabetes, and ESKD, the reporting of aggregated data masked the severity of these problems.

ESKD is perhaps the most illustrative example. Although an ESKD disparity among NHPs was suspected, there was a paucity of supportive evidence. Hints of this disparity emerged in 2011, when the US Renal Data System (USRDS) (3) first reported NHP data separately from those of Asian Americans in its "Healthy people 2020" chapter. In that report, numbers of new patients with ESKD were much higher in NHPs (approximately 2000 per million) than in blacks (approximately 1000 per million), Asian Americans (approximately 300 per million), and whites (approximately 250 per million) (3).

In 2017, the USRDS reported the disaggregated data more comprehensively in its ESKD volume for the first time (4). In that report, the ESKD incidence rate ratio for NHP compared with whites was 8.4 (4). By comparison, ESKD incidence rate ratios were 3.0 for blacks, 1.2 for American Indians/Alaska Natives, and notably, 1.0 for Asian Americans compared with whites (4). The USRDS advises cautious interpretation of the NHP data owing to significant differences regarding the reporting of multiple races among NHPs in the US Census data and the USRDS. Nevertheless, these extraordinarily high rates of ESKD among NHPs, the highest of any race group in the United States, are consistent with our observations.

In addition, NHPs initiate dialysis at younger ages than in other races. In one study, the mean age at dialysis initiation was much younger for NHPs (57 years old) than whites (65 years old) and an aggregated Chinese and Japanese group (68 years

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old) (5). The mean age at dialysis initiation is also younger outside the United States (44 years old for Maori versus 60 years old for whites) (6). NHPs with ESKD have been reported to have more favorable survival than whites (7); however, this could be because of younger age at dialysis initiation, with fewer age-related comorbidities. NHPs with ESKD are also less likely to receive a kidney transplant (53.9 in whites versus 13.7 in Samoans and 10.1 in Native Hawaiians per 1000 person-years) (7). NHPs residing in high-poverty neighborhoods are 70% less likely to receive a kidney transplant than NHPs residing in low-poverty neighborhoods, and those residing in high-poverty neighborhoods in Hawai'i and the Pacific are less likely to receive a transplant than similarly impoverished NHPs in California (8). Hence, poverty and geographic location are important determinants of the kidney transplant disparity.

The prevalence of non-ESKD CKD among NHPs in the United States is uncertain. To the best of our knowledge, only one study has reported CKD prevalence among NHPs using both eGFR and albuminuria measurements. That study evaluated individuals who attended a kidney disease screening event in Hawai'i, and 40% of 196 NHPs were identified as having CKD (eGFR < 60 ml/min per 1.73 m² or urinary albumin-to-creatinine ratio ≥ 30 mg/g) compared with 24% of 146 whites (9). The prevalence of hypertension was higher as well (76% versus 49% of whites) (9). The prevalence of CKD in this study is likely an overestimate, because this screening event targeted individuals at risk for CKD. Critical next steps include determining the risk factors and prevalence of CKD, CKD screening practices, and whether NHPs receive standard of care treatments that preserve kidney function. Because NHPs are spatially concentrated, one possible approach is to conduct inquiries in Hawai'i and the western United States, where many NHPs reside.

Diabetes Is a Major Cause of ESKD among Native Hawaiians and Pacific Islanders

Diabetes is a significant problem, and it is a major cause of ESKD in NHPs. In a study of individuals in Northern California, NHPs had incidence rates of diabetes (19.9 per 1000 person-years) that were much higher than those in blacks (11.2 per 1000 person-years), Latinos (11.2 per 1000 person-years), and Native Americans (12.0 per 1000 person-years), populations widely known to be at high risk of diabetes (10). The proportion of ESKD attributed to diabetes is also higher in NHPs (71%) than in whites (41%) (5). These patterns are also present in Australia and New Zealand, where ESKD attributed to diabetes is 63% in Maori, 55% in other Pacific Islanders, and 17% in whites (6). Obesity contributes to the high risk of diabetes and is an independent risk factor for CKD, and in Utah, 64% of NHPs surveyed had a body mass index ≥ 30 kg/m² (11). Although diabetes is believed to be the major cause of ESKD among NHPs, it is important to elucidate other common causes among NHPs.

Challenges of Providing Nephrology Care in the Pacific

The specific task of providing care to the NHP population in the Pacific is a major challenge, even in Hawai'i,

which has more resources than other islands. There is a critical shortage of nephrologists in Hawai'i owing to several factors, including an extraordinarily high cost of living. The majority of people who live in Hawai'i, including those who require ESKD care, reside on the island of O'ahu. For example, among 3807 individuals receiving hemodialysis or peritoneal dialysis in Hawai'i in 2016, most (*n* = 2839) were receiving their dialysis care on O'ahu. Of the 968 receiving care on other islands, 383 (40%) were identified as NHPs. Furthermore, 14 of the 23 dialysis units in Hawai'i are on O'ahu. Consequently, most nephrologists and other specialists who treat patients with ESKD reside on O'ahu. This creates an access barrier for those who reside on other islands. By necessity, nephrologists on O'ahu frequently travel to these islands to attend to patients with kidney disease. Patients often travel to O'ahu multiple times for medical care: for example, to secure vascular access. These issues drive up costs for patients and families, can be prohibitive for those with limited income, and can lead to significant delays in receiving medical care. Acute dialysis availability is also limited, and many patients must be transported by air ambulance to medical centers on O'ahu for their acute care. Completing kidney transplantation evaluations is difficult for individuals who reside on islands with limited medical resources, fostering a disparity in access to transplantation. Some patients, particularly those with more resources, choose to be listed on the continent. Those within the Kaiser Permanente system receive transplants at the University of California, San Francisco.

Dialysis is available in the Pacific territories; however, dialysis is not available in COFA nations, Tonga, and many other Pacific Island nations. Many come to the United States for treatment. If they are not lawfully present or are uninsured, the receipt of standard, thrice-weekly dialysis depends on local policies and practices (12). Consequently, many only receive emergent dialysis.

Health Insurance for Migrants from the Compact of Free Association

Poverty, poor access to health care, and rising sea levels have led to an influx of COFA citizens to the United States. Before the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), also called welfare reform, COFA migrants were eligible for federally funded benefits, including Medicaid. The PRWORA eliminated many of these benefits, which has been viewed by many as a violation of the COFA arrangement. Federal benefits were reinstated for other immigrant populations; however, COFA migrants remain ineligible for federally funded Medicaid and Medicaid expansion, although they pay federal, state, and local taxes. As lawfully present migrants, they are required to have health insurance, and they are eligible to receive insurance through Healthcare Marketplaces and subsidies based on income. Because they are ineligible for Medicaid expansion and typically have low-wage jobs, affordable health insurance is elusive for many. They are Medicare eligible if they meet the employment requirements, which is relevant for ESKD care. However, they may not receive pre-ESKD care owing to these issues. Re-establishing federally funded programs,

such as Medicaid with Medicaid expansion, is overdue. Doing so will help eliminate access barriers for COFA migrants. Although this is an important issue for COFA migrants, 92.2% of NHPs in the United States have some form of health insurance (1). Hence, lack of insurance does not seem to account for the health disparities experienced by NHPs.

Summary and Recommendations

ESKD incidence is extraordinarily high among NHPs in the United States. There is a critical need to determine CKD screening practices and the proportion who receive standard of care therapies that preserve kidney function. Diabetes is believed to be the major etiology of ESKD, but it is important to identify other causes. Elucidating biologic mechanisms that contribute to health disparities among NHPs could be informative. However, historical trauma, poverty, and marginalization in society are principal determinants of these disparities and should be top of mind. NHPs are heterogeneous in terms of culture, language, availability of resources, health care needs, geographic location, and historical connection to the United States. Hence, a one-size-fits-all approach to address diabetes, CKD, and other disparities is inappropriate. Many community-based organizations and clinics have implemented culturally tailored strategies to prevent and manage diabetes among NHPs. However, communities should not bear all of the load. United States imperialism has significantly affected the NHP community, and the federal government should support progress in this area. Federal agencies should fund clinically oriented research studies that will improve the lives of NHPs; invest in workforce development; and continue to enforce policies mandating the collection, analysis, and presentation of NHP data separately from those of other race groups. NHP communities understand their unique needs and should navigate the path forward as their ancestors once did.

Acknowledgments

The content of this article does not reflect the views or opinions of the American Society of Nephrology (ASN) or CJASN. Responsibility for the information and views expressed therein lies entirely with the author(s).

Disclosures

Dr. Na'ai reports personal fees from Liberty Nephrology Partners and personal fees from Fresenius Kidney Care outside the submitted work. Dr. Raphael has nothing to disclose.

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Published online ahead of print. Publication date available at www.cjasn.org.