

# RENAL DISEASE DISPARITIES IN ASIAN AND PACIFIC-BASED POPULATIONS IN HAWAII

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The prevalence of end-stage renal disease (ESRD) in the United States is expected to double over the next 10 years. The identification of ethnic differences in the prevalence, treatment, morbidity, and mortality related to chronic kidney disease (CKD) is of great concern. Asian Americans comprise a rapidly expanding sector of the U.S. population and are reported to have ESRD growth rates that are ~50% higher than caucasians.

Hawaii has a large, well-established Asian and Pacific-based population that facilitates the examination of disparities in renal disease among the state's diverse ethnic groups. The prevalence of ESRD in Hawaii has continued to rise due, in part, to high rates of diabetes, glomerulonephritis, and hypertension reported in Asian Americans and Pacific-based populations. ESRD patients in Hawaii have a two-fold higher prevalence of glomerulonephritis, compared with the general ESRD population in the United States.

Other potential sources of renal disparities—such as cultural factors, language barriers, and health access factors—among Hawaii's major ethnic groups are assessed. However, few studies have examined the relative contribution of these potential factors. Consequently, efforts to reduce and eventually eliminate renal disease disparities will require a better understanding of the major sources of health disparities, such as timely medical care, a diverse health workforce, and cultural/social barriers, that affect optimal health care practices in Asian and Pacific-based populations. (*J Natl Med Assoc.* 2003;95:955–963.)

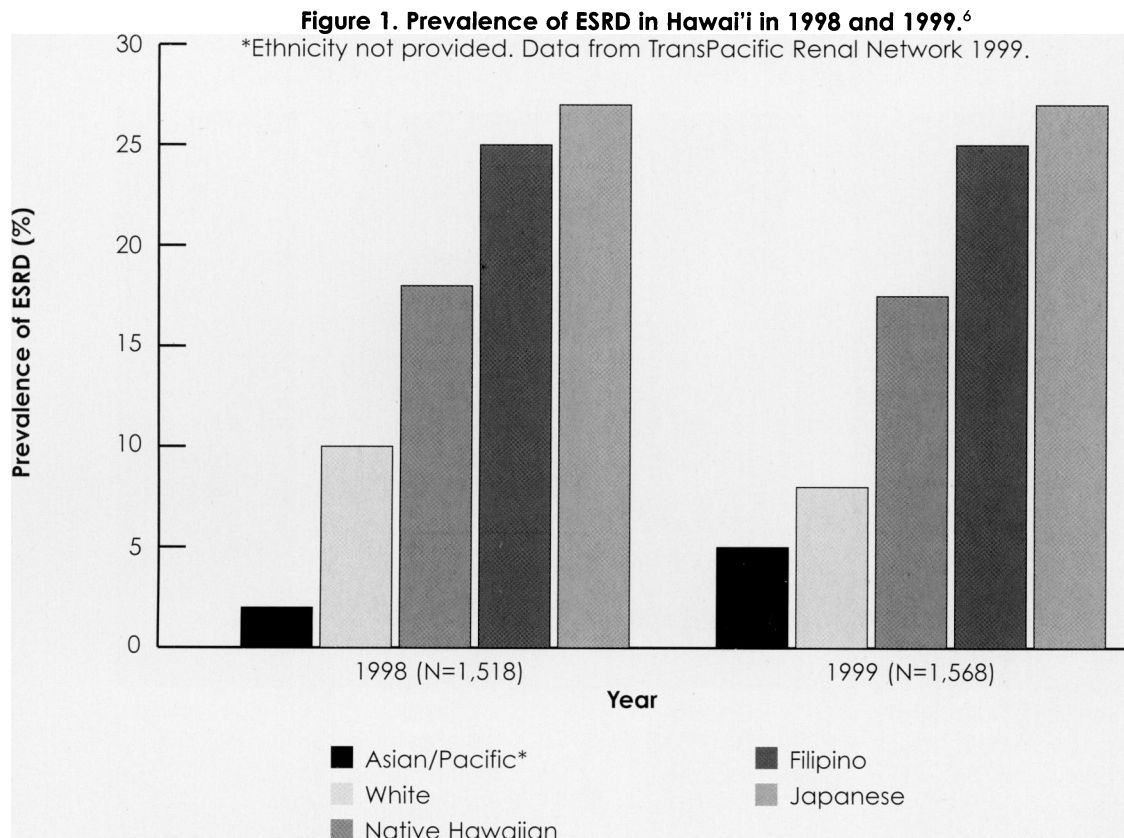
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## INTRODUCTION

In the United States, end-stage renal disease (ESRD) disproportionately affects ethnic minorities, with African Americans and American Indians reported to have the highest prevalence rates.<sup>1</sup> However, the sharpest rise in the rate of new ESRD cases has been seen in Asian Americans and Pacific Islanders.<sup>1,2</sup> Although the major causes of ESRD have been well described in other at-risk minority populations, such as African Americans, little is known about the relationship of established renal risk factors in Asian Americans and Pacific-based populations. Although this heterogeneous population comprises a small proportion (4%) of the U.S. population, it has experienced the largest growth rate since the 1970s, with a nearly 10-fold increase, compared with the overall growth rate of the general U.S. population.<sup>3</sup>

Hawaii has a well-established, ethnically



diverse population made up primarily of Asian Americans and Pacific-based populations (including Native Hawaiians, Samoans, and other Pacific Islanders). The five largest ethnic groups in Hawai'i are Japanese, Native Hawaiian, Filipino, Chinese, and caucasian (Figure 3). Collectively, these groups account for 80% of the state's 1.2 million residents.<sup>4,5</sup> Although some ethnic groups have lived in Hawai'i for generations, only Native Hawaiians are recognized as the indigenous people of Hawai'i, and they comprise 19.8% of the state's total population.<sup>5</sup>

The presence of a large and well-established Asian and Pacific-based population in Hawai'i has resulted in the collection of ethnic-specific data on chronic kidney disease (CKD) that is not otherwise available from other states in the U.S.<sup>1</sup> Thus, the purpose of this paper is to: 1) examine the existing literature on the prevalence, incidence, and underlying clinical causes for ESRD in Asian Americans and Pacific Peoples living in Hawai'i; 2) discuss other potential sources of renal disease disparities, such as cultural factors, language barriers, and health care access related to ESRD risk; and 3)

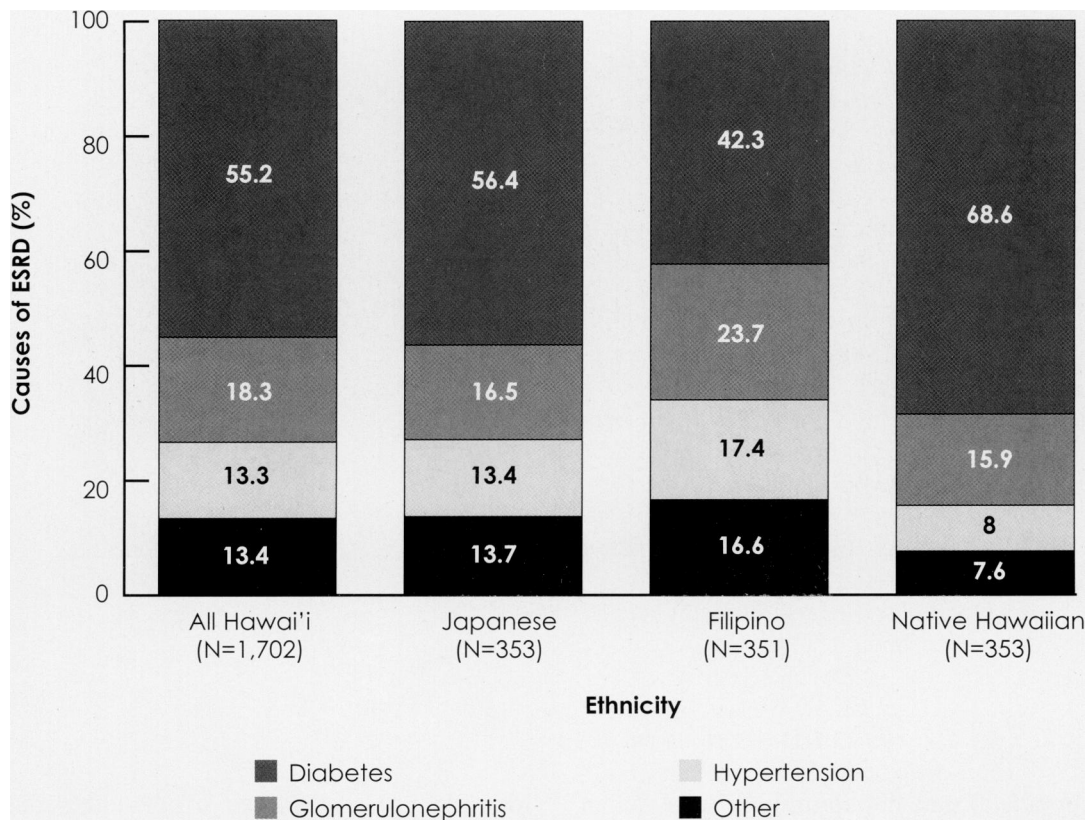
identify potential areas of research that will advance our understanding of the underlying causes and promising interventions to eliminate renal disparities in Asian and Pacific-based populations.

## PREVALENCE AND INCIDENCE OF ESRD

According to the national U.S. Renal Data System (USRDS), the prevalence of ESRD in the United States has nearly doubled over the past decade, increasing from 179,425 per year in 1990 to 344,094 per year in 1999.<sup>1</sup> Among Asian Americans, the increase in prevalence was 5,027 to 12,650 over the same time period.<sup>1</sup> Furthermore, the number of new ESRD cases among Asian Americans increased from 1,227 to 2,970 between 1990 and 1999.<sup>1</sup>

Although Pacific-based populations are not defined separately by the USRDS, the TransPacific Renal Network (TPRN) collects ESRD data specific to Hawai'i's multiethnic population, enabling the stratification of data according to the five major ethnic groups in the state. Of the 1,568 patients in Hawai'i diagnosed with ESRD in 1999, 88.2% of

**Figure 2. Causes of ESRD in Hawai'i in 2000 by Ethnicity.<sup>7</sup>**  
Data from TransPacific Renal Network 2000.



the patients on dialysis were of Asian and/or Pacific Island ancestry, with the major ethnic groups being Japanese (26.7%), Filipino (24.7%), and Native Hawaiian (17.0%) (Figure 1).<sup>6</sup> In Hawai'i, Filipinos appear to have disproportionately higher rates of ESRD relative to the proportion of Filipinos within the state's total population (14.1%) (Figure 3).<sup>4</sup>

### UNDERLYING CLINICAL CAUSES OF ESRD

In the United States, the most common underlying causes of ESRD in 2000 were diabetes mellitus (45%), hypertension (27%), and glomerulonephritis (9%).<sup>1</sup> Similarly, in Hawai'i's ESRD population, diabetes is the most common underlying cause of ESRD, accounting for 55.2% of the cases in 2000, followed by glomerulonephritis (18.3%) and hypertension (13.3%).<sup>7</sup> However, there are differences among the major ethnic groups in terms of the proportion of ESRD cases associated with clinical

risk factors. For example, Native Hawaiians have been shown to have the highest percentage of diabetes-induced renal failure (68.6%), while the lowest percentage was reported in Filipinos (42.3%). However, Filipinos have a higher proportion of glomerulonephritis-associated ESRD (23.7%), compared with Native Hawaiians (15.9%) (Figure 2).<sup>7</sup> Furthermore, the trends in ESRD distribution by ethnic group have remained relatively stable since 1997. This suggests that, although these ethnic groups reside in the same state, other determinants of ESRD exist that may vary between and within various Asian-American and Pacific-based populations.

The following section will review the current literature on the underlying clinical causes for ESRD in high-risk Asian-American and Pacific-based populations.

### Diabetes Mellitus

In Asian-American and Pacific-based popula-

tions living in Hawai'i, the overall prevalence of diabetes mellitus (DM) is estimated to be 9%—nearly 50% higher than the U.S. national rate.<sup>8,9</sup> Furthermore, epidemiological studies of rural Native Hawaiians have reported a prevalence of DM as high as 22.4% (age-standardized) in adults  $\geq 30$  years of age, with a further 15.6% being at increased risk for developing DM due to impaired glucose tolerance.<sup>10</sup> Furthermore, the prevalence of DM between Native Hawaiians and the U.S. population has increased consistently since the 1950s.<sup>11</sup>

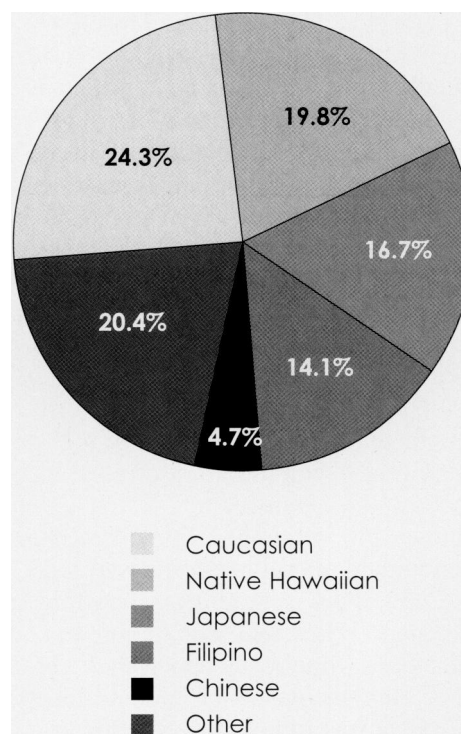
Based on cases of DM collected from the Behavioral Risk Factor Surveillance System, the Hawai'i State Diabetes Control Program found that Japanese had the highest rates in the state (8.6%), with Native Hawaiians and Filipinos having the second highest rates (5.8% and 6.0%, respectively).<sup>12</sup> In addition, a study of Japanese Americans living in Seattle and Hawai'i showed that the prevalence of DM was higher, compared with Japanese individuals living in Hiroshima, Japan (13.9% versus 6.5%, respectively [age-, sex-adjusted]),<sup>9</sup> which suggests that environmental factors in the United States may predispose Japanese immigrants to DM. Although there is a putative role for genetic factors in the development of DM among Native Hawaiians,<sup>11</sup> the increased incidence of the condition among the entire population of Hawai'i may be due to excessive dietary intake, physical inactivity, and subsequent obesity.<sup>12</sup>

## Hypertension

Hypertension (HTN) is a major risk factor for ESRD, because it causes hypertensive-vascular kidney disease and may also coexist with DM in the form of the insulin resistance syndrome.<sup>13,14</sup> Persistently elevated blood pressure, in combination with proteinuria, strongly predicts progression to CKD (estimated glomerular filtration rate  $< 60$  mL/min) and eventually to ESRD. HTN is the second most common cause of ESRD in the United States and is responsible for 27% of all cases.<sup>1</sup> However, in Hawai'i, HTN ranks as the third most common cause and accounts for only 13.3% of all ESRD cases. Yet, the reported prevalence of HTN in Hawai'i is relatively high at 23%.<sup>15</sup> Why HTN accounts for only 13.3% of the ESRD cases in Hawai'i, despite the relatively high prevalence of HTN, is not well understood and needs further investigation.

There have been few studies on the ethnic dif-

**Figure 3. State of Hawai'i Census—2000**  
Total population=1,211,537



ferences in HTN prevalence between Asian-American and Pacific-based populations living in the same geographic area. However, in a study of Japanese Americans aged 40–70 years, the prevalence of HTN was higher in the Hawai'i and Los Angeles groups (42.6% and 37.2% respectively), compared with their Japanese counterparts in Hiroshima (29.7%).<sup>16</sup> Furthermore, among Filipinos with ESRD, HTN was identified as the underlying cause in 17.4% of cases.<sup>7</sup> This is 4% higher than the entire ESRD population in Hawai'i.<sup>7</sup>

This increased prevalence of HTN among Hawaii's Japanese and Filipino populations translates into a greater risk of hypertension-induced kidney disease for these groups.

## Glomerulonephritis

Glomerulonephritis represents the third most common cause of ESRD in the United States, accounting for 11% of cases in 2000. However, in the ESRD population of Hawai'i, glomerulonephritis was the second most common cause, accounting

for 18.3% of cases in 2000.<sup>7</sup> Unfortunately, the etiology of glomerulonephritis in Hawaii's ESRD population is not well understood.

Glomerulonephritis usually presents as recurrent or persistent hematuria and proteinuria. In clinical practice, the diagnosis of glomerulonephritis is usually assigned to patients who have proteinuria but are nondiabetic, and for whom no other obvious diagnosis is evident. Although the definitive cause of glomerular disease is rarely determined at diagnosis of ESRD, possible causes include immunoglobulin A (IgA) nephropathy, postinfectious glomerulonephritis, and other glomerulonephritides. The prevalence of IgA nephropathy compared with all other primary glomerular diseases is only 5% in the United States but 30–40% in Asia.<sup>17</sup> Nearly one-third of all patients affected by IgA nephropathy will develop ESRD, and it has been reported to recur even after a successful kidney transplant.<sup>17</sup>

The largest proportion of Filipino ESRD patients diagnosed with glomerulonephritis was at 23.7% of cases in 2000. This is more than two-fold higher than the general U.S. ESRD population. In contrast, among Japanese Americans and Native Hawaiians in Hawai'i, the incidence of glomerulonephritis-induced ESRD was found to be significantly lower at 16.5% and 15.9% respectively.<sup>7</sup> It is unclear as to why there is a higher prevalence of glomerulonephritis-induced ESRD among Hawaii's Filipino population. Further studies designed to investigate the underlying causes of glomerulonephritis in Filipinos and other similar at-risk minority groups will provide much-needed information into this potentially reversible problem.

## Age

The proportion of Hawaii's elderly population is growing at a rate well above the national average.<sup>19</sup> Between 1990 and 1999, there was a 62% increase in people over 75 years old and a 13% rise in those 65–74 years old.<sup>19</sup> An increasingly aging population represents a higher risk for age-related health problems, such as CKD, diabetes mellitus, and hypertension. Among ESRD patients in Hawai'i during 1999, the mean age for Japanese patients was 66.3 years, compared to Filipino patients at 59.7 years and Hawaiians at 56.5 years of age.<sup>6</sup> The difference in the mean age of these three ethnic groups on ESRD has also been relatively consistent over time. Thus, age at onset of ESRD varies by

ethnic groups and suggests that age may have a differential effect among ethnic groups in Hawai'i.

## OTHER POTENTIAL SOURCES OF RENAL DISEASE DISPARITIES

### Cultural Factors

As in many ethnic populations, culture plays an important role in forming health attitudes of Asian-American and Pacific-based populations. It has been defined broadly as representing the "integrated pattern of human behavior that includes thoughts, communications, actions, customs, beliefs, values, and institutions of a racial, ethnic, religious, or social group".<sup>20</sup>

Culture may affect health attitudes by influencing individuals' perceptions of health services and how an illness is defined. In turn, these perceptions may influence patients' decisions about whom they are willing to see, how they will access health care services, and how much they entrust to the physician and/or provider. The experiences and observations of health care providers working in Hawaii's multiethnic communities have proved valuable for a better understanding of how these cultural and psychosocial factors may influence health-seeking behaviors, health beliefs, and attitudes.

### Native Hawaiians

For Native Hawaiians, the "culture of health" or beliefs about health are often centered on the concept of *lokahi*, meaning "being in balance or harmony." This balance is represented by a triangle with each point symbolizing one of the following: the spirit or supernatural, the physical body, and the mind or emotions. If any one of these concepts is out of balance, illnesses will result.<sup>21</sup>

An understanding of this view of health is important, as this affects the Native-Hawaiian patient's attitude towards western physicians and health practices. Any lack of acceptance of western medicine by the Native-Hawaiian patient may negatively influence their willingness to seek the appropriate medical care.

For many Native Hawaiians, traditional methods of healing are viewed positively and as "acceptable medical care", partly because they address all three aspects of health. The three most commonly practiced traditional healing methods are *la'au lapa'au*, which refers to herbal medicine; *lomilomi*, which relates to massage; and *ho'oponopono*, which

involves a conflict-resolution process used in families. Traditional Native-Hawaiian practitioners may choose to use one or a combination of these techniques to treat their patients.

For many Native Hawaiians, conflicts with western medicine may arise from the perception that western medicine is concerned only with physical well-being or with what can be proven scientifically. It may be perceived that this would result in the spiritual or emotional factors of their illness being ignored or minimized, and may lead to Native-Hawaiian patients seeking care from traditional healers who approach the problem more holistically—with consideration of a person's spiritual and emotional, as well as physical, well-being. Avoiding western medical care may lead to delayed presentation for appropriate medical treatment, despite its availability.

## Filipinos

For many Filipinos, attitudes towards illness stem from strong religious beliefs—illness and pain are often associated with guilt and punishment and may be perceived as being caused by spiritual and moral imbalances. As a result of religious ties with illness, Filipino patients may use the phrase *bahala na*, meaning “it's in the hands of God,” with regard to their health.

In many Asian cultures, seeking assistance from others, especially outside their own culture, is unacceptable. Expectations are that problems will be dealt with either by the individual or the family. Often, home remedies (adapted from Chinese medicine) are used in treating illness. When symptoms are severe, the person may turn to a folk practitioner (termed *hilot* in Filipino). The *hilot* may use one or more forms of treatment, including faith healing through prayer, herbal medicines, or massage and manipulation of bones and body tissues.<sup>22,23</sup>

In Filipino culture, maintaining amiable personal relationships is highly valued, so there is a strong desire to please others. In a patient–physician relationship, the Filipino patient may outwardly seem very agreeable with the physician and often respond with a “yes” when in fact he may actually not understand or agree with the recommendations.<sup>22,24</sup>

## Japanese

Western medicine was first introduced in Japan in 1542 and so, by the time Japanese laborers came

to Hawai'i in the 1860s, most of them knew both the western and *kampo*, the 2000-year-old Japanese medical system.<sup>22</sup> Japanese medicine differs from western medicine in that it was “developed around the belief that each individual is a part of a larger universe which interacts with and affects body process and physical activity”.<sup>22</sup> Therefore, in order to remain healthy, harmonious balance must be maintained. Traditional Japanese health practices included the arts of pharmacotherapy, acupuncture, moxibustion, and massage. The use of alternative healing methods, such as herbal medicines, was common practice in many Asian cultures, including Japanese.<sup>22,25</sup> However, the role of herbal medicines on the development of renal disease is largely unknown and unrecognized by western-trained physicians. Additional concepts that influenced one's health and well-being included: 1) *ie*, which relates to the importance and hierarchy of the family; 2) *bachi*, which means “curse”; and 3) *shikata ga nai*, which means “it cannot be helped”.<sup>22,23</sup>

Thus, several common themes prevail in the various health beliefs and attitudes of Hawaii's ethnically diverse populations. For example, both Asian and Pacific-based populations have strong ties to family and community. Wellness is achieved through balance or harmony of physical being and nature. They seem to share a sense of fatalism towards their health status, and they value interpersonal relationships, including the patient–physician relationship.

## Language Barriers

Among Hawaii's multiethnic population, language barriers persist for a significant number of ethnic groups, including Filipino, Korean, Vietnamese, and Micronesian. Although nearly all ethnic groups in Hawai'i have functional English-speaking skills, several households continue to converse in their own native language. For example, based on the 1990 census, more than 20,000 (4.5%) Asian-American or Pacific-Islander households in Hawai'i were considered linguistically isolated.<sup>26</sup>

Language barriers often impact the quality of the patient–physician relationship and may affect medical treatment, patient compliance, and health education. Few health care providers are multilingual, and medical translators are often unavailable. In addition, translated educational materials are expensive to develop and may not adequately address the cultural context of health and wellness

for the patient. For some Asian-American and Pacific-based populations, multiple dialects may further complicate the translation and interpretation of health information. These language barriers may predispose Asian-American and Pacific-based populations to suboptimal health care and may result in missed opportunities for the prevention of renal disease, resulting from diabetes, hypertension, and glomerulonephritis.

### Socioeconomic Status

Several studies have shown that health disparities in high-risk ethnic groups are closely associated with socioeconomic status factors, such as income, education, and occupation.<sup>27</sup> For example, low income limits access to adequate health care insurance and, thus, presents a barrier to accessing appropriate health care services.

Unfortunately, current statistics do not allow for the evaluation of ethnic differences in socioeconomic status between the diverse groups of Asian-American and Pacific-based populations. Typically when the Pacific-Islander ethnic groups are evaluated separately from the Asian-American category, they tend to have a lower socioeconomic status. For instance, in 1990, poverty levels varied from 12–40% in areas where Native Hawaiians are highly concentrated, whereas in communities with predominantly Filipino residents, the poverty level was found to be about 12%.<sup>26</sup> National and state estimates of the health status of Asian Americans and Pacific-based population subgroups are lacking. Therefore, further studies are needed to better understand the socioeconomic problems faced by these diverse groups.<sup>28</sup>

### Health Care Access

The health access factors that may be associated with renal disease disparities in Asian-American and Pacific-based populations include health insurance coverage, the number of health providers in a community, and the quality of care received by those at highest risk for CKD.

In 2000, 80% of the patients with ESRD were supported by some form of government-funded insurance. Approximately 55% of these patients still had private health insurance, while 7.6% had no insurance at all.<sup>1</sup> The number of nephrologists in the community may also be a factor in health access. In 2000, Hawai'i had more physicians (all specialties) per capita (2.5 per 1,000 residents) than the United States overall (2.1 per 1,000) and

was ranked ninth for the number of physicians per capita in the United States.<sup>19</sup> However, the physicians are highly concentrated in and around Honolulu—the largest city in the state—and Hawai'i has many remote and rural areas both on Oahu and the neighboring islands. Many of these rural communities are inhabited predominantly by Filipinos, Native Hawaiians, and other Pacific-based populations, and are considered to be medically underserved areas. This lack of access to nephrologists and primary care physicians may further compound the problem of receiving timely health care for chronic health problems, such as diabetes mellitus and hypertension. Prolonged periods of untreated or undertreated diabetes mellitus and hypertension may eventually lead to CKD and ESRD. These limitations in health access may provide a partial explanation for the higher rates of ESRD in some of the ethnic groups residing in rural areas of Hawai'i.

In addition to availability and accessibility of health care services, a need exists to provide “culturally competent” health care,<sup>29</sup> meaning that the physician possesses a set of skills that allows him/her to increase their understanding of cultural differences and similarities within, among, and between groups.<sup>30</sup> This involves being aware of the patients' perspectives. One approach for achieving this is to increase the ethnic diversity of the health care workforce in Hawai'i. Currently, Hawaii's health care workforce is not representative of the state's population. One example of this can be seen with Native-Hawaiian physicians who make up only 5.5% of Hawaii's physicians, although Native Hawaiians comprise ~20% of the state's population. Another way to improve health care for ethnic populations may be to increase the training of physicians (ethnic minority and non-ethnic minority) in the cultural attitudes and beliefs of their patients. With improved patient–physician communication, the physicians would be better equipped to address their patients' concerns in a respectful and sensitive manner. The improved patient–physician relationships may, in turn, positively affect health-seeking behaviors of Asian and Pacific-based populations with CKD and indeed other medical illnesses.

### Health Care Provider Biases

A multivariate analysis of 90,897 kidney disease patients in the United States showed that Asian-American patients were more likely than

caucasian patients to start dialysis later in the course of their disease (odds ratio 1.66).<sup>31</sup> Delays in referral to a physician or nephrologist limit the prospect of a patient receiving timely interventions aimed at slowing disease progression or preventing complications. Late referral is also associated with prolonged hospital stays, increased expense, and higher mortality rates.<sup>32,33</sup> Mortality rates for patients during the first year of dialysis vary by up to 38% among states. Hawai'i has one of the highest overall ESRD death rates, with a first-year death rate exceeding 271 per 1,000 patient years.<sup>1</sup>

Transplantation is the treatment of choice for many patients with ESRD. However, racial and geographical inequalities are evident in transplantation rates. For example, patients in Hawai'i are less likely than patients living in the continental U.S. to receive a kidney transplant. Asian-American ESRD patients are only half (55%) as likely to be listed for transplantation as their caucasian counterparts.<sup>31</sup> These factors further compound access to health care and likely contribute to the rising rates of ESRD in states similar to Hawai'i with a high proportion of Asian and Pacific-based ethnic groups.

## **FUTURE RESEARCH ON RENAL DISEASE DISPARITIES**

Hawai'i has a high prevalence of ESRD, and nearly 90% of patients are of Asian- or Pacific-based ethnic background. Our understanding of the biologic, clinical, and social causes for this excess health burden is limited. Potential factors, such as undertreated diabetes mellitus and hypertension, cultural practices and beliefs, language barriers, access to health care, and health care provider biases, all require further investigation. New insights into potentially modifiable risk factors in Asian-American and Pacific-based peoples will provide better opportunities for developing effective treatments and/or health policies to prevent or reduce kidney failure.

The lack of awareness among patients, communities, and health care professionals of the looming problem of CKD in Hawai'i poses a major obstacle in the prevention of ESRD. There is a need to raise the level of awareness of risk factors for CKD and to promote the optimal management of diabetes mellitus and hypertension. In addition, more studies are needed to investigate why glomerulonephritis is a major cause of ESRD in Asian-American and Pacific-based populations.

To reduce the rates of ESRD in Asian-American and Pacific-based populations, ethnic communities in Hawai'i—especially the Filipino, Native-Hawaiian, and Japanese communities—will need to be involved to effectively mobilize health care professionals, policy makers, and the wider community. Initiatives, such as community outreach programs that involve elements of screening, appropriate patient referral, and optimization of therapy, have the potential for having a positive impact on the management of CKD and ESRD.

Health care delivery systems appropriate for the ethnically and culturally diverse population of Hawai'i may need to be developed to overcome social and cultural barriers. Evidence suggests that approaches for the management of chronic disease states, such as diabetes mellitus and hypertension—that are sensitive to different cultural beliefs—are effective in multiethnic communities.<sup>34,35</sup> There is a need for an increased health workforce in communities with a high population density of Filipino, Native-Hawaiian, and Japanese groups. In addition, policy makers, locally and nationally, need to be educated about the problems faced by Asian-American and Pacific-based populations and many other ethnic/racial minority populations in the United States who experience renal health disparities.

## **CONCLUSIONS**

A multipronged approach aimed at increasing CKD research for patient education and effective health care services for Asian-American and Pacific-based populations is necessary to reduce disparities in CKD and ESRD. These efforts should be fully supported by both public and private organizations, as they address our national health agenda to reduce and eventually eliminate all racial/ethnic health disparities in the United States.

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