Mortality Patterns of Native Hawaiians Across Their Lifespan: 1990–2000

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Objectives. We examined mortality patterns across the lifespan of Native Hawaiians and compared mortality disparities across races.

Methods. We determined the age-specific and age-adjusted mortality rates of Native Hawaiians from 1990 to 2000 by using national census and vital registration data.

Results. Among Native Hawaiians aged younger than 1 year, expected deaths were 15% lower than for Blacks and 50% higher than for Whites. Among older adults, Native Hawaiians had higher rates of mortality compared with the general population, particularly in 1990 and 1995. Crude death rates for Native Hawaiians were similar to those for Blacks in 1990 and 1995 but were 20% lower than those for Blacks by 2000. Crude death rates for Native Hawaiians were 30% higher than for Whites in 1990 and 1995 and more than 40% higher than for Whites in 2000.

Conclusions. Compared with Whites, Native Hawaiians and Blacks face similar challenges regarding infant and early-life mortality and increasing risks of mortality in mid-life and early old age. Our analyses document a need for renewed efforts to identify the determinants of ill health and commitment to address them. (*Am J Public Health.* 2010;100:2304–2310. doi:10.2105/AJPH.2009.183541)

In 1997, the US Office of Management and Budget (OMB) implemented a new classification for identifying racial groups that, for the first time, designated "Native Hawaiians and Other Pacific Islanders" (NHPIs) as a distinct racial group, separate from Asians.[1,2] Traditionally, Pacific Islanders have been aggregated with Asian populations in statistical reports and public-use data sets under the "Asian/Pacific Islander" category. This Asian/Pacific Islander grouping has created ongoing measurement problems because of high levels of heterogeneity within the category.[3–5] The disaggregation of Asians from the category comprising NHPIs was a major first step in accurately characterizing these culturally, linguistically, demographically, and sociopolitically diverse populations.[6–10] Additionally, the OMB 1997 classification of race and ethnicity facilitated new opportunities for analysis of national-level data on NHPI health.[11–19]

The Native Hawaiian group represents the largest sector (46%) of the NHPI population[20] and is the only indigenous subpopulation within the NHPI designation. Thus, the Native Hawaiian population is similar sociopolitically to other indigenous populations such as American Indians and Alaska Natives, in that their indigenous status reflects a distinct relationship with the US federal government, which can have important implications for their health. Historically, Native Hawaiians were the first inhabitants of the Hawaiian archipelago. Their population was about 800000 at the time of the first Western contact [21] in 1778, although by the early 1900s, the introduction of new diseases and cultures had reduced the native population by 85%.[22–29]

Little is known about the health of Native Hawaiians outside of the state of Hawaii, owing in large part to the sample limitation in most national-level surveys. An accurate assessment of morbidity and mortality among Native Hawaiians has also been hampered by their aggregation with Asians, which increased sample sizes but made it impossible to look at heterogeneity within this diverse population.[30,31] Still, reports of health outcomes among NHPIs have increased somewhat in recent years. These reports suggest that NHPIs face elevated risks for cardiovascular disease,[19] poor health,[13,14,17,18] cancer,[15,16] obesity and diabetes,[32,33] and mortality across the life course.[11,12,34,35] However, baseline health statistics from larger national databases on specific health issues, which represent a vital element for informing policies on NHPI health and well-being, remain sparse.

Because mortality represents a key outcome measure to inform policymakers and public health officials on the overall health of a population, we examined mortality patterns across the lifespan of Native Hawaiians. Using well-established demographic estimation techniques, we calculated age-specific and age-adjusted mortality for the period 1990 through 2000, allowing us to compare Native Hawaiian health disparities with those of Blacks and Whites.

METHODS

Mortality data were obtained from the National Center for Health Statistics (NCHS) Multiple Cause of Death Files.[36,37] Birth data for intercensal estimates were obtained from the NCHS Natality Detail Files.[38–40] For this study, population denominators (representing populations at risk) were derived from special tabulations of the Native Hawaiian population from the 1990 US Census and from published population counts in the Population Summary File 1 of the 2000 US Census.[41] Because we were calculating rates for multiple years, it was necessary to generate annual estimates of the population between censuses.

Measures

The analysis used 4 basic variables: age, reported race, annual births, and deaths. The population denominator was stratified by age and racial category (Native Hawaiian, Black, and White). Mortality and natality counts were derived from NCHS data for the years 1990 through 2000 for each racial category and are used with census enumerations for the intercensal estimation process.

Statistical Methods

The estimation technique used to generate intercensal denominators came from the

Balancing Equation, which represents the fundamental measure of population change across time[42] and is typically written as

$$\begin{aligned}\text{Pop}_{(t)} = {} & \text{Pop}_{(t-1)} \\ & + \text{Births}_{(t)} - \text{Deaths}_{(t)} \\ & + (\text{In} - \text{Migration}_{(t)} \\ & - \text{Out-Migration}_{(t)})\end{aligned} \tag{1}$$

where Pop is population, t is time, and t–1 represents the time period before the present estimation. Because Native Hawaiians represent a population indigenous to the United States and because the analysis was restricted to national-level measures of mortality, the immigration component of the balancing equation canceled out. This allowed us to focus on how births and deaths affected the size of the Native Hawaiian population across the 10-year period.

There are multiple challenges to calculating mortality rates for Native Hawaiians. One concern is the major change in racial identification that occurred between censuses. In 1990, individuals had to identify a primary race on the US Census form, but in 2000 they were allowed to identify with multiple races.[43,44] Although useful for understanding the social process of racial self-identification, this change seriously affected the ability to compare demographics between 1990–2000.[45–49]

The 1990 US Census used the generic classification "Native Hawaiian alone or in combination" (hereafter referred to as 1990 Native Hawaiian Combination).[43] The 2000 US Census allowed a choice between "Native Hawaiian alone" (hereafter referred to as Native Hawaiian Alone) or "Native Hawaiian in combination with any other race" (hereafter referred to as Native Hawaiian Multiracial).[41] This new classification resulted in a near doubling of the reported Native Hawaiian population across the decade, from 211014 in 1990 to 401162 in 2000. Because the Native Hawaiian population cannot grow through immigration, this change represents far more than total births minus total deaths across the decade. In our analysis employing the 1990 standard, the total Native Hawaiian population in the 2000 US Census was estimated at approximately 250159. We interpreted this discrepancy of approximately 151000 Native Hawaiians as an outcome of the new enumeration approach in the 2000 US Census. Although not denying the importance of recognizing multiracial backgrounds, we currently lack the capacity to control for multiracial status within a standard mortality analysis.

An additional complication was that the accounting of NCHS-reported births and deaths for Native Hawaiians as tabulated by the Centers for Disease Control and Prevention continues to use the 1990 definition. To address these inconsistencies, we generated intercensal estimates by projecting the 1990 Native Hawaiian Combination population forward by using the Cohort Component Method.[42] This method, a practical application of the Balancing Equation, subtracts deaths at each age$_{(i)}$ at time $t_{(1)}$ and then ages the surviving members of the age group to the next time period $t_{(1+t)}$ and adds new births recorded by $t_{(1+t)}$ to the new population Pop$_{(1+t)}$. This approach represents a practical method for generating annual estimates of Native Hawaiians from 1990–2000. The mortality estimates emerging from these calculations are presented as model 1 in Tables 1 and 2.

Although it is hypothetically possible to calculate a population growth pattern that would approximate the more than 400000 individuals enumerated in the 2000 US Census under the classification of Native Hawaiian Multiracial, we cannot account for the population increase in terms of excess births over deaths. We have, however, compared the Native Hawaiian Combination and the Native Hawaiian Alone (Model 2) populations in Tables 1 and 2 to illustrate how changes in definition can significantly affect vital-event estimates.

RESULTS

Tables 1 and 2 use ratio differences to describe results for how Native Hawaiians Alone, Blacks, and Whites compare with the 1990 Native Hawaiian Combination reference groups. Table 1 presents age-specific death rates for the estimated population of the 1990 Native Hawaiian Combination group (model 1) and Native Hawaiian Alone group (model 2) compared with US Census Bureau intercensal estimates for Black (model 3) and White (model 4) populations. Under normal health trajectories, mortality risk is typically high among infants and children younger than 5 years before declining and then increasing at older ages, creating the typical "bathtub"-shaped mortality curve.[42]

Table 1 shows that the denominator used to define Native Hawaiians can significantly affect reported levels of mortality. The use of Native Hawaiian Alone (model 2) is appealing because it assumes that individuals reporting this ethnicity are more likely to fully experience the health and life-course disparities associated with this group. Unfortunately, the numerator information (from death certificates) used to calculate rates tends to exaggerate mortality rates for the Native Hawaiian Alone group because rates for this population cannot be disaggregated from those for the Native Hawaiian Combination group; therefore, we had to use reported deaths for all Native Hawaiians as collected by the NCHS as the numerator.

Our analysis suggests that the population estimates obtained by using the 1990 US Census definition for Native Hawaiian Combination (model 1) give the most appropriate approximation of the Native Hawaiian population, both in terms of population change across the intercensal period and the definition used to measure the numerator information. Consequently, the rates for the 1990 Native Hawaiian Combination group (model 1) are used as our comparison group for comparing mortality patterns among the Native Hawaiian Alone group, Blacks, and Whites.

Age-Specific Mortality Rates

As shown in Table 1, when data from the Native Hawaiian Alone group are used in the denominator of the equation, crude death rates and age-specific death rates are up to 302% higher than when 1990 Native Hawaiian Combination data are used in the denominator. This overstatement of mortality for the Native Hawaiian Alone group is reduced as mortality increases in later life, so that by age 85 years and older the numbers of expected deaths per 10000 for the 2 groups become closer, although the numbers are still not identical. These estimates provide an example of how mortality estimates can be exaggerated if denominators and numerators are not drawn from the same population.

When we compared mortality patterns for the 1990 Native Hawaiian Combination group (model 1) with patterns for Blacks and Whites

TABLE 1—Age-Specific Death Rates for Native Hawaiian Combination Group Compared With Native Hawaiian Alone Group, Blacks, and Whites: 1990–2000

	Death Rate[a] for 1990 Native Hawaiian Combination Group (Model 1), by Year			Ratio[b] for Native Hawaiian Alone Group (Model 2), by Year			Ratio[b] for Blacks (Model 3), by Year			Ratio[b] for Whites (Model 4), by Year		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
Crude death rate[a]	60	63	66	2.08	1.88	1.78	1.46	1.38	1.26	1.49	1.46	1.50
No. of deaths by age, y												
<1	169	104	139	2.96	2.57	2.43	1.14	1.51	1.15	0.47	0.62	0.52
1–4	8	6	3	3.02	2.67	2.52	0.92	1.17	1.81	0.50	0.59	1.11
5–14	2	3	2	2.58	2.30	2.17	1.78	1.27	1.26	1.16	0.79	0.94
15–24	14	10	8	2.21	1.94	1.83	1.15	1.53	1.60	0.65	0.81	1.07
25–34	15	17	9	2.49	2.26	2.14	1.86	1.71	2.33	0.78	0.74	1.20
35–44	28	30	36	1.76	1.59	1.50	1.74	1.73	1.03	0.69	0.70	0.54
45–54	81	85	71	1.45	1.32	1.25	1.14	1.09	1.16	0.53	0.49	0.58
55–64	173	189	178	1.59	1.51	1.42	1.13	0.97	0.93	0.65	0.56	0.55
65–74	436	396	429	1.45	1.44	1.36	0.85	0.90	0.80	0.59	0.63	0.56
75–84	797	695	939	1.27	1.38	1.31	0.87	1.00	0.73	0.75	0.84	0.61
≥85	1449	1809	2009	0.93	1.08	1.02	0.99	0.79	0.75	1.07	0.86	0.79
Total	3172	3344	3822	4038	4278	4636	3088	3021	3015	2684	2649	2665

Note. Native Hawaiian Combination refers to those classified as being of Native Hawaiian heritage, alone or in combination with other races, as part of the 1990 US Census definition. Native Hawaiian Alone refers to those classified as being exclusively of Native Hawaiian heritage as part of the 2000 US Census definition.
[a]Rate per 10 000 population.
[b]Ratio of death rate for indicated group to death rate for 1990 Native Hawaiian Combination group.

for the 3 time periods, a commonly observed mortality pattern emerged: Whites had the highest crude death rates, followed by Blacks, and then by the 1990 Native Hawaiian Combination reference group. In terms of specific differences, Blacks had a higher number of expected deaths for children aged younger than 1 year than did the 1990 Native Hawaiian Combination group. The higher rates of infant mortality among Blacks compared with Whites are well documented, but the finding that expected deaths among the 1990 Native Hawaiian Combination group aged younger than 1 year were only 15% lower than deaths observed among Blacks in 1990 and 2000 represented new information. Mortality rates among White children aged younger than 1 year were 50% lower than those for the 1990 Native Hawaiian Combination group.

Table 1 shows that compared with Blacks, the 1990 Native Hawaiian Combination group had somewhat higher rates of expected deaths among the elderly (aged ≥ 65 years); the largest difference was in 2000, when the mortality rate for the Native Hawaiian Combination group was 25% higher among those aged 85 years and older. Among those aged 15 to 44 years, Blacks had considerably higher mortality rates than did the 1990 Native Hawaiian Combination group, with expected deaths up to 233% higher for the same age periods. The higher Black mortality rates reflect the distorted mortality curve seen among Blacks, particularly Black males, attributable to the increased risks for many young Black men of deaths related to violence and to poor health, nutrition, and social access.[50–53] Although the 1990 Native Hawaiian Combination age groups also had higher rates of expected mortality than their White counterparts, the differences were not as stark and showed considerable variation in expected death rates for those aged 15–44 years. Compared with the 1990 Native Hawaiian Combination group, Whites had 15% to 40% lower rates of expected deaths among the "young old" (aged 65–84 years), with this difference declining but not disappearing among the "oldest old" (aged ≥ 85 years).

Age-Adjusted Mortality Rates

To address variations in the age distribution across race and to measure disparities in mortality using comparable population structures, we employed standardized age distributions based on the 2000 US Standard Million population, which is the recommended comparison standard when work is done with age structures in the United States. Using this standard population allowed us to generate directly comparable age-adjusted mortality rates and expected deaths across our subpopulations.[54–56] Table 2 presents these age-adjusted expected deaths by using standardized mortality rates for our study populations.

Compared with Whites, the Native Hawaiian Combination group had a much more rapid entry into the higher mortality associated with age, particularly in 1990 and 1995. In those years, marked differences between expected deaths in the 2 groups began at age 15; in subsequent age groups, Native Hawaiians had a much higher number of expected deaths than did Whites. By the year 2000, this negative relationship was less marked, but the

TABLE 2—Age-Adjusted Death Rates for Native Hawaiian Combination Group Compared With Native Hawaiian Alone Group, Blacks, and Whites: 1990–2000

	Death Rate[a] for 1990 Native Hawaiian Combination Group (Model 1), by Year			Ratio[b] for Native Hawaiian Alone Group (Model 2), by Year			Ratio[b] for Blacks (Model 3), by Year			Ratio[b] for Whites (Model 4), by Year		
	1990	1995	2000	1990	1995	2000	1990	1995	2000	1990	1995	2000
Age group, y												
<1	234	144	192	2.96	2.57	2.43	1.14	1.51	1.15	0.47	0.62	0.52
1–4	46	33	17	3.02	2.67	2.52	0.92	1.17	1.81	0.50	0.59	1.11
5–14	28	39	30	2.58	2.30	2.17	1.78	1.27	1.26	1.16	0.79	0.94
15–24	192	145	110	2.21	1.94	1.83	1.15	1.53	1.60	0.65	0.81	1.07
25–34	210	225	115	2.49	2.26	2.14	1.86	1.71	2.33	0.78	0.74	1.20
35–44	453	483	587	1.76	1.59	1.50	1.74	1.73	1.03	0.69	0.70	0.54
45–54	1091	1147	952	1.45	1.32	1.25	1.14	1.09	1.16	0.53	0.49	0.58
55–64	1511	1645	1554	1.59	1.51	1.42	1.13	0.97	0.93	0.65	0.56	0.55
65–74	2878	2615	2831	1.45	1.44	1.36	0.85	0.90	0.80	0.59	0.63	0.56
75–84	3573	3119	4210	1.27	1.38	1.31	0.87	1.00	0.73	0.75	0.84	0.61
≥85	2247	2806	3115	0.93	1.08	1.02	0.99	0.79	0.75	1.07	0.86	0.79
Total	12463	12400	13715	17457	17211	17828	12500	12279	11555	9111	8924	8765

Note. Native Hawaiian Combination refers to those classified as being of Native Hawaiian heritage, alone or in combination with other races, as part of the 1990 US Census definition. Native Hawaiian Alone refers to those classified as being exclusively of Native Hawaiian heritage as part of the 2000 US Census definition.
[a]Death rates are per 10000 population.
[b]Ratio of death rate for indicated group to death rate for 1990 Native Hawaiian Combination group.

differences grew dramatically by entry into mid-life (at approximately 45 years of age).

Differences in expected deaths between Native Hawaiians and Blacks were smaller. Blacks also showed higher expected mortality at younger ages; rates among Blacks were comparatively higher than those experienced by Native Hawaiians until the age of 65 years, when Native Hawaiians had higher expected death rates than did Blacks.

In other analyses (not shown), we explored differences in expected deaths when the standardized population (1990 Native Hawaiian Combination) was used as the denominator. When we examined only the crude death rates for Whites and Blacks compared with the 1990 Native Hawaiian Combination reference group, a new pattern emerged in which the White population had an expected overall mortality approximately 30% lower than mortality for either the 1990 Native Hawaiian Combination group or Blacks. The crude death rate for the 1990 Native Hawaiian Combination group was almost identical to that among Blacks in 1990 and 1995, but was approximately 20% lower than the rate among Blacks in 2000. The crude death rate for the 1990 Native Hawaiian Combination group was 30% higher than that among Whites in 1990 and 1995 and more than 40% higher than the rate among Whites in 2000.

Age-Adjusted and Unadjusted Denominators

Table 3 compares the 3 different definitions of Native Hawaiian self-identification used in this analysis: (1) 1990 Native Hawaiian Combination, using the 1990 definition and projected to the year 2000 (model 5); (2) Native Hawaiian Alone as defined in the 2000 US Census (model 6); and (3) Native Hawaiian Multiracial as defined in the 2000 US Census (model 7). Table 3 presents age-specific death rates using the same numerator of recorded deaths reported by NCHS in 2000 for those identified as being of Native Hawaiian Combination origin in 1990.

As shown in Table 3, the crude death rates and the expected deaths using the 2000 definition for Native Hawaiian Alone (model 6) inflated the mortality estimates compared with our conservative Native Hawaiian Combination (model 5) projected denominator for 2000. By contrast, use of the 2000 US Census Native Hawaiian Multiracial (model 7) definition had the opposite effect, significantly suppressing the expected deaths compared with the Native Hawaiian control population and making Native Hawaiians appear healthier and more long-lived than might actually have been the case.

DISCUSSION

Using disaggregated population-based data and cohort component intercensal estimates to access Native Hawaiian mortality patterns and explore mortality disparities, we established baseline health statistics to inform specific public health intervention programs and policies and offer a rare examination of Native Hawaiian mortality patterns at the national level. We found that Native Hawaiians lag behind Whites and are more likely to suffer greater risk of early death. Similar to Blacks, Native Hawaiians face an accelerated entry into both mid-life and late-life mortality compared with the extended longevity experienced by

TABLE 3—Age-Specific Death Rates for Native Hawaiian Populations: 1990 and 2000

	Death Rate per 10 000 Population		
	1990 Native Hawaiian Combination (Model 5)	2000 Native Hawaiian Alone (Model 6)	2000 Native Hawaiian Multiracial (Model 7)
Crude death rate	66	117	41
Age group, y			
<1	139	338	73
1–4	3	8	2
5–14	2	4	1
15–24	8	15	5
25–34	9	18	7
35–44	36	54	22
45–54	71	88	39
55–64	178	253	118
65–74	429	583	276
75–84	939	1226	574
≥85	2009	2048	1008

Note. Native Hawaiian Combination refers to those classified as being of Native Hawaiian heritage, alone or in combination with other races, as part of the 1990 US Census definition. Native Hawaiian Alone refers to those classified as being exclusively of Native Hawaiian heritage as part of the 2000 US Census definition. Native Hawaiian Multiracial refers to those classified as being of Native Hawaiian heritage, alone or in combination with other races, as part of the 2000 US Census definition.

Whites. Although this disparity in both longevity and mortality is well established for the Black population, our analysis is the first illustration of this pattern for Native Hawaiians using national-level data. Our results are also consistent with state-level mortality rates reported in Hawaii, where the largest proportions of Native Hawaiians reside.[57]

These baseline measures provide useful epidemiological evidence, allowing policymakers and public health officials to initiate future efforts to develop targeted programs to eliminate disparities in morbidity and mortality among Native Hawaiians. The results of our data also highlight age-specific mortality and show how risk of death is distributed across the lifespan.[58,59] In particular, the infant (age<1 year) and mid-life (age 15–34 years) stages of life of the Native Hawaiian population seem particularly vulnerable to early death compared with their corresponding White age groups. In fact, Native Hawaiian mortality parallels mortality rates found among the Black population of similar age-specific categories. This poses a new Native Hawaiian paradigm not previously reported because of limitations in nationally reported data, which were overcome in our study.

Our results also support the idea that renewed efforts are needed to better understand the specific causes and risk factors of increased mortality among Native Hawaiians and other high-risk minority populations (Pacific Islanders, American Indians, Alaska Natives, Southeast Asians, and so forth). The results of this study provide initial findings that should prompt further investigation into the precursors to premature mortality among Native Hawaiians, such as level of access to health care and prenatal care, socioeconomic status, colonization, oppression, and other social determinants of health outcomes.[60] Elderly Native Hawaiians (aged≥65 years) have higher expected death rates than their Black and White counterparts, suggesting that relatively fewer Native Hawaiians have benefited from the increased longevity enjoyed by the rest of the nation as a whole.[61,62]

Another core finding of this study is the need for careful attention to the choice of numerator and denominator information given the evolving self-identification patterns of Native Hawaiians and other racially admixed populations over the last decade. Methodologically, the fact that changing definitions of the population at risk can affect the validity of age-specific mortality rates has largely been ignored because of the limited amount of data available for analysis. We have attempted to examine this issue and to propose an approach that provides sufficient reliability of estimates derived from national-level data that can be used to answer policy and public health issues related to this high-risk population. Mortality estimates can be exaggerated if denominators and numerators are not consistent.[63,64] Our analytical approach explicitly attempted to address inconsistencies in the 2000 US Census definitions of Native Hawaiian populations, adjusting our estimates to be comparable with definitions used by the US Census Bureau and the NCHS for the time periods of interest. By projecting the 1990 US Census population of 1990 Native Hawaiian Combination forward to 2000 by using definitions that retained comparability with the NCHS mortality accounting, we feel we have more reasonable estimates of the actual mortality experience of this population. In fact, we have shown that the unreflexive use of 2000 population definitions can result in significant under- or overestimates of mortality depending on the reference group used. Because both policy and interventions are based on the available data, very different interpretations and policy initiatives could emerge.[65]

Systematic analysis of numerically small, understudied populations such as Native Hawaiians can be accomplished if care is taken in the development of consistent denominator and numerator information. Although our ultimate goal was the development of new resources that will more directly measure NHPI subgroups, our analysis shows that the use of well-established demographic techniques can successfully inform understanding of mortality among populations such as NHPIs that are numerically small but have large disparities in health.

Limitations

This study had limitations typical of analyses that use administrative data. Historically, minority populations have been undercounted in US Census data, for a variety of reasons. In addition to the relatively small number of questions that the US Census Bureau asks about health, the decennial data collection

strategy makes it difficult to follow minority populations that are experiencing rapid growth and evolution, such as NHPIs. We also faced the concerns associated with small population analysis. Our own approaches and interpretations were guided by a well-established literature on this topic.[63]

On US birth certificates, the race of a child is not formally recorded and the race of the mother is used for purposes of statistical tabulations.[47,64] On death certificates, the race of a decedent is normally assigned through proxy, often by a licensed funeral director, attending physician, or medical examiner. Ultimately, however, just as the newborn provides no personal input on a birth certificate, the decedent offers none on a death certificate.[47,55,64–66] Because of these inherent peculiarities in the collection of demographic information on populations, both the denominator and numerator data contain potential sources of bias and error.[64–66] Although little can be done to adjust these potential sources of error, they do need to be understood and do require careful examination of the definitions used to assign individuals to specific racial/ethnic categories. In addition, all possible steps need to be taken to ensure that the data are as comparable across denominators and numerators as possible.

Conclusions

When the Native Hawaiian population is combined with the Asian population, it appears that the combined group has markedly lower levels of mortality compared with that of Whites and the US average. Consistent with other recent reports on the health of Native Hawaiians,[19] our analyses document a pattern of elevated mortality risk. This pattern emphasizes the importance of renewed efforts to identify the determinants of ill health for this population and a new commitment to address them.

The results of this study provide the first step in providing national-level estimates of mortality among Native Hawaiians that allow for comparative analysis with mortality among Whites and Blacks. This analytical approach is innovative and provides a basis for other diverse populations to better understand the specific details of their health risks. This approach can better inform public health advocates and policymakers and help collective efforts to confront persistent disparities in health and health care in the United States. As the United States becomes increasingly diverse both racially and ethnically, this type of approach will provide new insights into the underpinnings of differences in morbidity and mortality and how best to reverse them in racially diverse populations. ■

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Contributors

S.V. Panapasa conceptualized the study, conducted analysis, and wrote the original draft of the article. M.K. Mau assisted with the interpretation of the findings and the writing of the article. D.R. Williams assisted with the analysis, the interpretation of the findings, and the writing of the article. J.W. McNally also conceptualized the study, assisted with the analysis, and contributed to the interpretation of the findings to the writing.

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This study was approved by the institutional review board of the University of Michigan.

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