

# Suicide Among Asian American, Native Hawaiian, and Pacific Islander Veterans: Rates and Methods, 2005–2019



Lindsey L. Monteith, PhD,<sup>1,2,3</sup> Julie A. Kittel, PhD,<sup>1,2</sup> Alexandra L. Schneider, BA,<sup>1</sup>  
Christin N. Miller, MPH,<sup>1</sup> Laurel A. Gaeddert, MS,<sup>1</sup> Ryan Holliday, PhD,<sup>1,3</sup> Lisa A. Brenner, PhD,<sup>1,2,3</sup>  
Claire A. Hoffmire, PhD<sup>1,2</sup>

**Introduction:** Knowledge of suicide rates and methods among Asian American, Native Hawaiian, and Pacific Islander (AANHPI) Veterans remains sparse. Age- and sex-specific suicide rates, methods, and trends were examined among AANHPI Veterans and were compared with findings reported for all Veterans.

**Methods:** For this population-based retrospective cohort study, average annual suicide rates (2005–2019) were computed in 2023 using population (U.S. Veterans Eligibility Trends and Statistics) and mortality (National Death Index [NDI]) data. The cohort included 416,454 AANHPI Veterans (356,146 males, 60,229 females) separated from military service and alive as of 1/1/2005. Suicide was determined from NDI underlying cause-of-death ICD-10 codes.

**Results:** The age-adjusted average annual suicide rate among AANHPI Veterans increased 36.85% from 2005–2009 to 2015–2019 (2015–2019: 30.97/100,000). Relative to other ages, 2015–2019 suicide rates were highest among AANHPI Veterans 18–34 (overall: 53.52/100,000; males: 58.82/100,000; females: 32.24/100,000) and exceeded those of similarly aged Veterans in the overall Veteran population (overall: 44.71/100,000; males: 50.59/100,000; females: 19.24/100,000). The sex difference in suicide rates was lower among AANHPI Veterans than in Veterans overall (relative risk [males to females]=1.65 and 2.33, among those 18–54). Firearms were used less and suffocation more among AANHPI Veterans, relative to Veterans overall.

**Conclusions:** Suicide among AANHPI Veterans is an increasing public health concern, with younger males and females at particularly elevated risk. Lethal means safety strategies for AANHPI Veterans should consider distinctions in suicide methods compared to the overall Veteran population. Research is warranted to understand the lower magnitude sex difference in suicide rates among AANHPI Veterans.

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## INTRODUCTION

In 2021, 2.4% of the Asian American (AA) and 6.8% of the U.S. Native Hawaiian/Pacific Islander (NHPI) adult populations were Veterans.<sup>1</sup> AANHPI Veterans comprised 2.0% of the U.S. Veteran population in Fiscal Year (FY) 2020 and this is expected to increase over time.<sup>2</sup> Concerningly, the suicide rate among AANHPI Veterans increased 167.3% from 2001

From the <sup>1</sup>VA Rocky Mountain Mental Illness Research, Education and Clinical Center for Suicide Prevention, Aurora, Colorado; <sup>2</sup>Department of Physical Medicine and Rehabilitation, University of Colorado Anschutz Medical Campus Aurora, Colorado; and <sup>3</sup>Department of Psychiatry, University of Colorado Anschutz Medical Campus, Aurora, Colorado

Address correspondence to: Lindsey L. Monteith, PhD, Rocky Mountain Regional VA Medical Center, Rocky Mountain MIRECC for Suicide Prevention, 1700 North Wheeling St., Aurora, CO 80045. E-mail: [lindsey.monteith@va.gov](mailto:lindsey.monteith@va.gov).

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to 2020, from 11.3 to 30.2 per 100,000 person-years.<sup>3</sup> This magnitude of increase was not observed for any other racial or ethnic group of Veterans, in which increases ranged from 11.2% to 55.4%.<sup>3</sup>

Unfortunately, knowledge regarding suicide among AANHPI Veterans is limited to the 2022 *National Veteran Suicide Prevention Annual Report*<sup>4</sup> and its associated Data Appendix.<sup>3</sup> These important sources reported crude suicide rates among AANHPI Veterans from 2001 to 2020, and rates by age and sex for Veterans broadly; however, age-adjusted, age-specific, and sex-specific rates were not reported for AANHPI Veterans. Age adjustment is vital for making unbiased within- and between-group population comparisons as the age distribution of such groups may differ and/or change over time. Additionally, sex- and age-specific rates are important to assess as sex and age differences in suicide rates are commonly observed within the Veteran population.<sup>3,4</sup> Further, insight into these differences can inform prevention approaches (e.g., targeting messaging, awareness of need for and approaches to sex-sensitive strategies).

Moreover, while information is available regarding use of different suicide methods among Veterans who died by suicide,<sup>4</sup> such data have not been disaggregated by race or ethnicity. Thus, the extent to which those findings apply to AANHPI Veterans is unknown. As the beliefs, expectations, and meanings associated with different suicide methods vary across cultures,<sup>5</sup> distinctions in suicide methods among AANHPI Veterans, relative to Veterans overall, are plausible and would maximize lethal means safety relevance and effectiveness for AANHPI Veterans.

Accordingly, this study examined suicide rates (overall, age-specific, and sex-specific) and change over time, along with suicide methods, among AANHPI Veterans, including differences by age and sex. To contextualize findings, results were compared to previously established suicide rates and methods in the overall Veteran population.

## METHODS

### Study Population

This retrospective cohort study included 450,583 AANHPI Veterans in U.S. Veterans Eligibility Trends and Statistics (USVETS<sup>6</sup>) FY 2005–2020 files. USVETS provides the most complete data available on living U.S. Veterans by compiling Department of Veterans Affairs (VA), Department of Defense (DoD), and commercial source information. Each FY file contains data for Veterans alive at the FY beginning and separated preceding or during the FY. Race was known (nonmissing; not coded as unknown/other) for 96.27% of USVETS records; of those, 0.06% were indicated as “multiracial,” and race

could not be distinguished for those classified as “multi-racial.” Therefore, only those listed as “Asian,” “Native Hawaiian or Pacific Islander,” or “Asian or Pacific Islander, Unspecified” were included. The Colorado Multiple Institutional Review Board provided regulatory approval.

### Measures

USVETS data assessed sex (at birth), age, VHA enrollment and use (2005–2021), race, and ethnicity. As USVETS determines race/ethnicity from VA, DoD, and commercial data, misclassification is possible since some sources may not rely solely upon self-identification to determine race/ethnicity. Mortality data were obtained from the Centers for Disease Control and Prevention (CDC) National Death Index records included in the VA/DoD Mortality Data Repository (MDR). Suicides were identified based on ICD-10 underlying cause-of-death codes (U03, X60–X84, Y87.0). Suicide methods data were obtained from MDR underlying cause-of-death codes, utilizing comparable categories (firearm [ICD-10 X72–X74], suffocation [ICD-10 X70], poisoning [ICD-10 X60–X69], or other) used by CDC and elsewhere.<sup>7</sup>

### Statistical Analysis

Analyses were conducted between 2022 and 2023, using SAS, Version 9.4. Suicide rates (crude, age-adjusted, age-specific, and sex-specific) were computed for the full study period (2005–2019) and three 5-year observation periods (2005–2009, 2010–2014, 2015–2019) to obtain reliable rates by age while providing information on changes over time. Age (in years) was categorized as: 18–34, 35–54, 55–74, and  $\geq 75$  to mirror and facilitate comparisons to the 2001–2019 VA Suicide Report Data Appendix.<sup>8</sup> Average annual suicide rates (reported per 100,000 person-years) were calculated using person-time as the denominator. Person-time was calculated: as time since most recent military separation date or study start (1/1/2005), whichever was later, to date of death or end of study period (12/31/2019), for the full period; from start, or entry into, each period to date of death or end of period, for the 5-year observation periods. Age-adjusted rates were computed when  $\geq 5$  suicide deaths occurred in each age group, using the direct method and 2000 U.S. Standard Population.<sup>9</sup> To maintain privacy, rates were suppressed when  $< 10$  suicide deaths occurred; the next smallest cell was also suppressed when a suppressed value could be derived from other values reported. When  $< 16$  suicide deaths occurred, rates were marked as unreliable.

Pairwise comparisons between observation periods were used to examine how suicide rates changed over

time. Age-specific comparisons among females were limited to those <55 due to few suicide deaths (<10) in older age groups ( $\geq 55$ ). Rate ratios (relative risk; RR) were calculated to compare sex-specific rates overall (18–54) and among those 18–34 and 35–54. Proportions of suicide deaths by method category (overall, by age, by sex) were calculated to determine the extent to which different methods were used among AANHPI Veterans who died by suicide (2005–2019). As all rates and RR presented here are population values, associated confidence intervals are not reported.<sup>4</sup>

To contextualize findings with respect to the full Veteran population, the 2001–2019 VA Suicide Data Appendix<sup>8</sup> was referenced, which lists crude and adjusted suicide rates (calculated from MDR<sup>8</sup>) from 2001 to 2019. These comprehensive rates (overall; age- and sex-specific) were obtained for the periods of interest and compared to parallel rates computed for AANHPI Veterans. Proportions of suicide deaths by method category were compared between AANHPI Veterans and Veterans overall.<sup>10</sup>

## RESULTS

Veterans were excluded if: missing most recent separation date ( $n=20,673$ , 4.6%) or birth date in USVETS ( $n=197$ ; 0.04%); age at study initiation (beginning of study or date entered cohort)  $\leq 17$  or  $> 110$  ( $n=766$ , 0.17%); died during service ( $n=957$ , 0.2%); separated after study period ended ( $n=11,463$ , 2.5%); or separation date was invalid ( $n=73$ , 0.02%). The final analytic cohort included 416,454 AANHPI Veterans, representing the full population of interest, aside from minimal exclusions due to missing data.

The analytic cohort was 85.52% male ( $n=356,146$ ) and 14.46% female ( $n=60,229$ ), with a mean age of 38.35 (SD=17.10). Race included Asian ( $n=251,461$ ; 60.38%), Native Hawaiian or Pacific Islander ( $n=36,680$ ; 8.81%), and Asian or Pacific Islander, unspecified ( $n=128,313$ ; 30.81%). The mean time since military separation was 22.27 years (SD=17.75). Over half were enrolled in VHA care ( $n=220,497$ ; 52.95%), and 41.33% ( $n=172,131$ ) had used VHA services (2005–2021).

Age-adjusted suicide rates among AANHPI Veterans increased 36.85% from 2005–2009 to 2015–2019 (Table 1). The majority of this increase occurred between 2005–2009 and 2010–2014 (30.97%), with an additional small increase from 2010–2014 to 2015–2019 (0.65%). In 2015–2019, the average annual age-adjusted suicide rate was 30.97/100,000.

Regarding age-specific suicide rates (Table 1), AANHPI Veterans 18–34 exhibited the highest rates across all periods. This elevation was particularly notable

in 2015–2019 (53.52/100,000). Conversely, 2015–2019 rates in older age groups ranged from 19.38/100,000 (55–74) to 20.90/100,000 (75+). Increases in rates between 2005–2009 and 2010–2014 were observed in all age groups except 75+; the largest such increase was observed among those 55–74 (89.52%), followed by those 18–34 (39.40%). However, between 2010–2014 and 2015–2019, a large increase was observed among those 75+ (61.02%); small increases were observed for those 18–34 (1.19%) and 55–74 (1.15%); the rate decreased (7.63%) among those 35–54.

Among male AANHPI Veterans, the age-adjusted suicide rate (2005–2019) was 31.25/100,000 (Table 1). Increases were observed over time: by 33.89% from 2005–2009 to 2015–2019, primarily driven by a 34.46% increase from 2005–2009 to 2010–2014, followed by a 0.42% decrease from 2010–2014 to 2015–2019. The highest rates among males occurred for those 18–34, with a 2015–2019 rate (58.82/100,000) nearly 3 times (RR=2.71) that of males 35–54 (21.68/100,000). Increases in rates among males 18–34 occurred from 2005–2009 to 2010–2014 (35.75%), though decreased slightly (2.94%) from 2010–2014 to 2015–2019 (31.77% increase over the full period).

Among female AANHPI Veterans 18–54, the age-adjusted suicide rate (2005–2019) was 20.30/100,000 (Table 1). The age-adjusted rate increased 46.26% from 2005–2009 to 2010–2014, followed by an 8.19% increase from 2010–2014 to 2015–2019 (58.23% increase over the full period). Those 18–34 had the highest rate (32.24/100,000), double (RR=2.02) that of those 35–54 (15.99/100,000) in 2015–2019.

Sex-specific rates were compared. Risk for suicide among males relative to females was higher overall (18–54; RR=1.65) and among those 18–34 (RR=1.82) and 35–54 (RR=1.36).

The most frequently used suicide method among AANHPI Veterans was firearms (49.69% of deaths; Table 2). Firearm usage was highest among those  $\geq 75$  (69.49%) and 18–34 (52.51%). The second most frequently used method was suffocation (29.52%). Poisoning (11.28%) and other methods (9.51%) were less common. Firearm was also the most common method among males (51.49%), followed by suffocation (29.06%). Conversely, among females, suffocation (34.19%) was most common, followed closely by firearms (31.62%).

Comparing findings to the overall Veteran population, the average annual suicide rate among AANHPI Veterans 18–34 in 2015–2019 was *higher* than the rate among similarly aged Veterans in the overall Veteran population (Figure 1). For all other age groups (35–54, 55–74,  $\geq 75$ ), rates for AANHPI Veterans were *lower*

**Table 1.** Suicide Rates, by Age, Sex, and Time Period, among AANHPI Veterans (2005–2019)

Period	18–34			35–54			55–74			75+			Total			
	n	Person-Years	Rate	n	Person-Years	Rate	n	Person-Years	Rate	n	Person-Years	Rate	n	Person-Years	Crude Rate	Age-Adjusted Rate
Overall																
2005–2009	134	353,145	37.94	85	463,803	18.33	24	237,469	10.11	19	131,223	14.48	262	1,185,639	22.10	22.63
2010–2014	289	549,392	52.89	128	571,133	22.41	58	302,769	19.16	16	123,308	12.98	491	1,543,602	31.81	30.77
2015–2019	293	547,430	53.52	151	729,455	20.70	73	376,679	19.38	24	114,860	20.90	541	1,768,424	30.59	30.97
Overall	716	1,446,966	49.48	364	1,764,391	20.63	155	916,917	16.90	59	369,391	15.97	1,294	4,497,665	28.77	28.75
Males																
2005–2009	126	282,252	44.64	75	406,533	18.45	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	244	1,046,321	23.32	24.93
2010–2014	265	437,319	60.60	110	485,776	22.64	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	448	1,329,417	33.70	33.52
2015–2019	258	438,641	58.82	131	604,302	21.68	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	485	1,501,397	32.30	33.38
Overall	649	1,158,211	56.03	316	1,496,611	21.11	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	1,177	3,877,134	30.36	31.25
Females <sup>c</sup>																
2005–2009	<sup>a</sup>	<sup>a</sup>	<sup>a</sup>	10	57,265	17.46	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	18	128,153	14.05	14.70
2010–2014	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	18	85,347	21.09	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	42	194,410	21.60	21.50
2015–2019	35	108,559	32.24	20	125,117	15.99	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	55	233,676	23.54	23.26
Overall	67	288,509	23.22	48	267,729	17.93	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	<sup>b</sup>	115	556,239	20.67	20.30

Note. *n*'s reflect number of suicide deaths. Rates derived from person-years. All rates are listed per 100,000 person-years. AANHPI = Asian American, Native Hawaiian, and Pacific Islander.

<sup>a</sup>Suppressed due to value <10.

<sup>b</sup>*n* suppressed so that value <10 cannot be derived through subtraction.

<sup>c</sup>As there were <10 suicide deaths in the 55-74 and 75+ age groups in the last observation period, those 55+ were not included in suicide rate calculations for females.

**Table 2.** Suicide Methods Among AANHPI Veterans, by Age and Sex (2005–2019)

Method	18–34 n (%)	35–54 n (%)	55–74 n (%)	75+ n (%)	Total n (%)
<b>Overall</b>					
Firearm	376 (52.5)	158 (43.4)	68 (43.9)	41 (69.5)	643 (49.7)
Suffocation	212 (29.6)	111 (30.5)	<sup>b</sup>	<sup>a</sup>	382 (29.5)
Poisoning	70 (9.8)	50 (13.7)	<sup>b</sup>	<sup>a</sup>	146 (11.3)
Other	58 (8.1)	45 (12.4)	<sup>b</sup>	<sup>a</sup>	123 (9.5)
<b>Males</b>					
Firearm	349 (53.8)	148 (46.8)	<sup>b</sup>	<sup>b</sup>	606 (51.5)
Suffocation	191 (29.4)	94 (29.8)	<sup>b</sup>	<sup>a</sup>	342 (29.1)
Poisoning	52 (8.0)	36 (11.4)	<sup>b</sup>	<sup>a</sup>	114 (9.7)
Other	57 (8.8)	38 (12.0)	<sup>b</sup>	<sup>a</sup>	<sup>b</sup>
<b>Females</b>					
Firearm	27 (40.3)	10 (20.8) <sup>c</sup>	<sup>a</sup>	<sup>a</sup>	37 (31.6)
Suffocation	21 (31.3)	17 (35.4)	<sup>a</sup>	<sup>a</sup>	40 (34.2)
Poisoning	<sup>b</sup>	<sup>b</sup>	<sup>a</sup>	<sup>a</sup>	<sup>b</sup>
Other	<sup>a</sup>	<sup>a</sup>	<sup>a</sup>	<sup>a</sup>	<sup>a</sup>

<sup>a</sup>Suppressed due to value <10.

<sup>b</sup>n (%) suppressed so that value <10 cannot be derived through calculation.

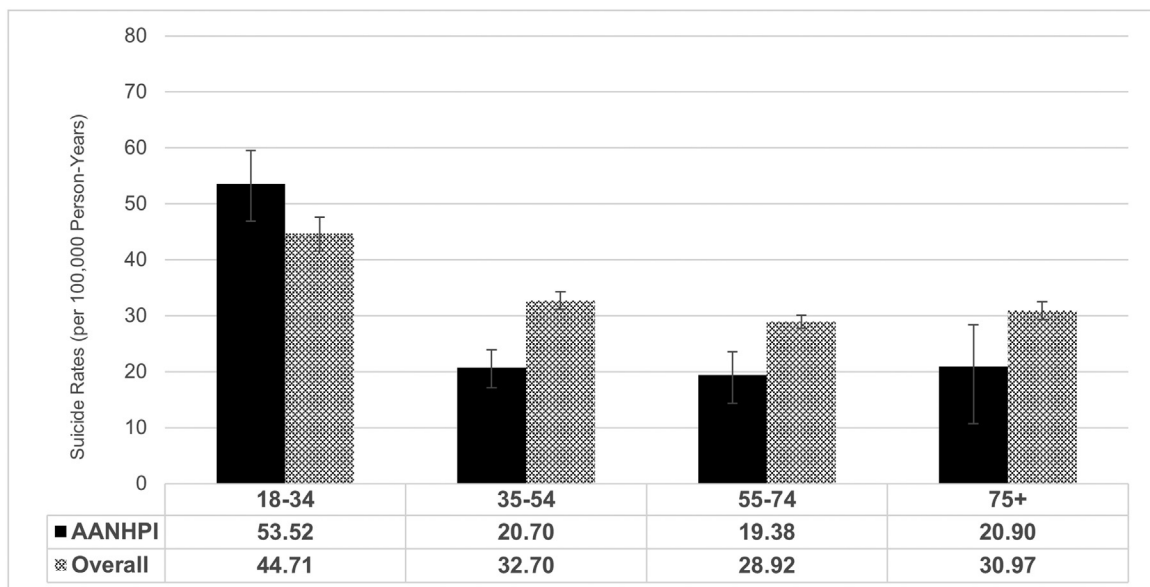
<sup>c</sup>Unreliable (n<16); interpret with caution.

AANHPI = Asian American, Native Hawaiian, and Pacific Islander.

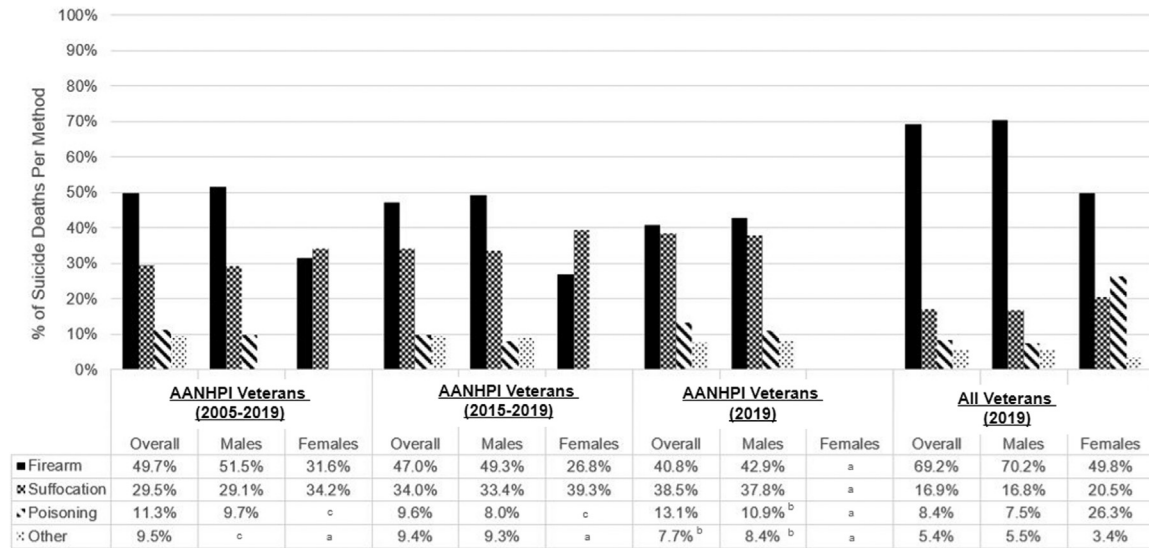
than those for all Veterans. AANHPI Veteran males and females 18–34 also had higher rates than similarly aged Veteran males and females in the overall population; however, the magnitude of this difference was larger among females (RR=1.68) than males (RR=1.16) (Appendix Figure 1). Among Veterans 35–54, both

male and female AANHPI Veterans had lower rates than similarly aged Veterans in the overall population; the magnitude of this difference was also larger among females compared to males (RR=0.92 and 0.61).

Firearms were used in a lower proportion of suicide deaths among AANHPI Veterans (40.8% in 2019) than



**Figure 1.** Suicide rates among Asian American, Native Hawaiian, and Pacific Islander Veterans compared to Veterans overall, by age group (2015–2019). Suicide rates for Veterans overall were obtained from the 2001–2019 National Data Appendix. AANHPI = Asian American, Native Hawaiian, and Pacific Islander.



**Figure 2.** Suicide methods used in suicide deaths among Asian American, Native Hawaiian, and Pacific Islander Veterans, compared to Veterans overall. Suicide rates for all Veterans were obtained from the 2001–2019 National Data Appendix. AANHPI = Asian American, Native Hawaiian, and Pacific Islander. <sup>a</sup>Suppressed due to value <10. <sup>b</sup>Proportion unreliable due to n<16; interpret with caution. <sup>c</sup>n (%) suppressed so that value <10 cannot be derived through calculation.

in the overall Veteran population (69.2% in 2019<sup>9</sup>; Figure 2). Further, the sex difference in firearms as a suicide method was more pronounced among AANHPI Veterans (1.62 times more males than females), relative to Veterans overall (1.41 times more males than females). In contrast, suffocation was used in a higher proportion of suicide deaths among AANHPI Veterans (38.5% in 2019<sup>9</sup>); this occurred for both females and males. The percentage of Veterans who used poisoning as a suicide method was relatively similar for AANHPI Veterans (13.1% in 2019) and Veterans overall (8.4% in 2019<sup>9</sup>).

## DISCUSSION

The AANHPI Veteran population is expected to grow over the next decade,<sup>2,11</sup> yet has rarely been a focus of suicide research.<sup>12</sup> Age-adjusted suicide rates among AANHPI Veterans increased from 2005–2009 to 2010–2014 and remained high in 2015–2019. For context, in both the overall Veteran and non-Veteran adult populations, age- and sex-adjusted suicide rates increased from 2001 to 2018, then declined from 2019 to 2020.<sup>3</sup> However, among AANHPI females and males within the U.S., the age-adjusted suicide rate did *not* significantly increase from 1999 to 2014<sup>13</sup> or 1999 to 2017,<sup>14</sup> despite increasing in all other racial/ethnic groups among females<sup>13,14</sup> and some<sup>13</sup> or all<sup>14</sup> racial/ethnic groups among males. Yet the suicide rate among

AANHPI individuals increased from 2014 to 2019<sup>15</sup> and between 2018 and 2019, despite decreasing between 2018 and 2019 among White and American Indian/Alaska Native individuals.<sup>15</sup> Thereafter (2018–2021), the age-adjusted suicide rate among AA and NHPI populations did not significantly change except among AA individuals ages 45–64 (decrease of 15.9%).<sup>16</sup> This suggests that AANHPI Veterans have experienced different epidemiological trends in suicide rates over time compared to the overall Veteran and AANHPI populations; research is warranted to better understand reasons for this.

Notably, the most recent age-adjusted rate (30.97/100,000 in 2015–2019) among AANHPI Veterans far exceeded 2021 rates among Asian (6.8/100,000) and Pacific Islander (12.6/100,000) individuals within the broader U.S. population.<sup>16</sup> This suggests that, within the AANHPI population, those who are Veterans are at particularly elevated risk and warrant targeted intervention. Given increasing suicide rates, rapidly understanding and addressing factors contributing to suicide risk among AANHPI Veterans is essential.

Examining age-specific rates revealed important differences. Similar to the overall Veteran population, the youngest AANHPI Veterans (18–34) had the highest suicide rates (53.52/100,000 in 2015–2019). This occurred for both males (58.82/100,000) and females (32.24/100,000), although the magnitude of the difference in suicide rates between AANHPI Veterans and Veterans overall was higher among younger (18–34)

females than similarly aged males. Thus, there is a particular need to understand reasons for the heightened risk among younger AANHPI Veterans, relative to Veterans overall, particularly among females. Ensuring that suicide prevention initiatives reach younger AANHPI Veterans of both sexes is also critical.

Suicide rates among older age groups of AANHPI Veterans (35–54, 55–74, ≥75) were lower than comparable age groups in the overall Veteran population, although specific age groups experienced notable increases (89.52% among those 55–74 from 2005–2009 to 2010–2014; 61.02% among those 75+ between 2010–2014 and 2015–2019). Understanding factors that explain these age-based differences is necessary.

Male AANHPI Veterans had higher suicide rates than females across analyses, which is consistent with findings in the overall Veteran population<sup>10</sup> and with the “gender paradox” of suicide, in which men are more likely to die by suicide.<sup>17</sup> However, the magnitude of the observed sex difference was reduced for AANHPI Veterans. This appears to be due to a combination of factors, including particularly high rates of suicide among female AANHPI Veterans, relative to the overall female Veteran population. Importantly, the age-adjusted suicide rate among AANHPI Veterans 18–54 increased more among females than males. Thus, effective gender-sensitive suicide prevention programming for AANHPI Veterans is critical, as is elucidating sex and gender differences in experiences that exacerbate and mitigate suicide risk among AANHPI Veterans.

Finally, firearms accounted for the largest percentage of suicide deaths among AANHPI Veterans—used in nearly half (49.69%) of suicide deaths from 2005 to 2019 and 40.8% in 2019. While firearms also represent the most common suicide method in the overall Veteran population (69.2% of deaths in 2019),<sup>4,10</sup> firearms accounted for a *lower* proportion of suicide deaths among AANHPI Veterans. In contrast, the proportion of AANHPI Veteran suicide decedents who used suffocation as their suicide method was double that of Veterans overall (38.5% vs 16.9% in 2019). Among female AANHPI Veterans, suffocation was among the most common suicide methods, a finding that differs from the overall female Veteran population. While other research has reported hanging to be particularly prevalent among AANHPI populations,<sup>18</sup> lethal means safety initiatives specific to suffocation remain limited, relative to strategies to address firearms or medications.<sup>19–21</sup> Thus, this remains a crucial area for future research to ensure that suicide prevention strategies for AANHPI Veterans are comprehensive and culturally sensitive.

Findings highlight several important avenues for subsequent research. Research to better understand suicide

drivers among AANHPI Veterans is key. Potential drivers warranting additional research among AANHPI Veterans include racially-based stressors, stress associated with racial and gendered microaggressions, interpersonal factors, decreased use of mental health services, structural racism, and “hidden” suicidal ideation.<sup>12,22–25</sup>

Further, suicide scripts theory posits differences in the situations in which suicidal behavior is “expected” across cultures and timeframes, with different methods and consequences.<sup>5</sup> Understanding how cultural expectations regarding suicide vary by age, sex, and gender among AANHPI Veterans is essential. Applying this framework may also aid understanding differences in suicide methods. Determining optimal ways to engage AANHPI Veterans in lethal means safety, including strategies to prevent suffocation, is another important area for future research. Further, determining how to prevent suicide among AANHPI Veterans in a culturally informed, gender-sensitive manner is critical. Given heterogeneity within this population, tailored methods that consider cultural identity and intersectionality, such as regarding gender, age, and region, are warranted. As specific regions (e.g., U.S. Pacific Island Territories, Hawaii, California) have high numbers of AANHPI Veterans,<sup>26</sup> regional efforts may be important for targeted suicide prevention. Lastly, given significant racial discrimination experienced among AANHPI individuals during the COVID-19 pandemic,<sup>27</sup> examining population-specific suicide rates during and following the pandemic is essential.

### Limitations

While this study provides new information essential to understanding suicide among AANHPI Veterans, limitations should be noted. First, due to the data available regarding race,<sup>28</sup> findings between AA and NHPI Veterans could not be disaggregated. Considering the heterogeneity between AANHPI cultures<sup>29,30</sup> and cultural variation in the prevalence of suicidality,<sup>31,32</sup> data disaggregation is essential<sup>33,34</sup> and should occur when sufficiently disaggregated data are available. Relatedly, there is the potential for misclassification of race and ethnicity, given how these were coded in USVETS. Additionally, suicide rates presented may underreport deaths for AANHPI Veterans who had missing race/ethnicity data or who were multiracial, as these individuals were not included; multiracial individuals and those whose race/ethnicity is listed as “other” may be at further elevated risk.<sup>35,36</sup> Another limitation is that findings were contextualized with data from Veterans overall,<sup>8,10</sup> rather than including specific comparison groups of Veterans with other racial/ethnic identities. This study also did not empirically examine how findings compared to the

broader AANHPI population, which is important for future research. Formal trend analyses also were not conducted as 3 time points are insufficient to do so. Finally, Veterans from U.S. Pacific Island Territories, such as Guam, generally were not included due to lack of data availability; this is an important limitation given large numbers of AANHPI Veterans in these regions<sup>37,38</sup> and high regional rates of suicide.<sup>39–41</sup>

## CONCLUSIONS

To the authors' knowledge, this represents the most in-depth study of suicide rates and methods among AANHPI Veterans, an understudied heterogeneous population. Suicide rates among AANHPI Veterans are high and have increased over time, particularly among those 55–74 and females. Age and sex differences in suicide rates and methods were evident; younger Veterans (18–34), including males and females, are at particularly elevated risk. Firearms were more commonly used by males and suffocation by females. Distinctions in suicide risk and methods compared to the overall Veteran population included lower use of firearms, higher use of suffocation, and a smaller sex difference in suicide rates among AANHPI Veterans. Culturally sensitive suicide prevention efforts and inquiry that incorporate various aspects of one's identity (e.g., race/ethnicity, sex/gender, age) may be particularly important to ensure that suicide prevention efforts are appropriately tailored to the needs and experiences of AANHPI Veterans.

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## CREDIT AUTHOR STATEMENT

Lindsey L. Monteith: Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Project administration, Funding acquisition, Supervision; Julie A. Kittel: Conceptualization, Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Visualization; Alexandra L. Schneider: Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Visualization, Project administration; Christin N. Miller: Methodology, Formal analysis, Writing – original draft, Writing – review & editing, Visualization, Project administration; Laurel A. Gaeddert: Writing – original draft, Writing – review & editing, Visualization; Ryan Holliday: Writing – review & editing, Funding acquisition; Lisa A. Brenner: Writing – review & editing, Funding acquisition; Claire A. Hoffmire: Conceptualization, Methodology, Writing – original draft, Writing – review & editing, Supervision, Project administration, Funding acquisition.

## SUPPLEMENTAL MATERIAL

Supplemental materials associated with this article can be found in the online version at <https://doi.org/10.1016/j.amepre.2023.09.006>.

## REFERENCES

1. U.S. Census Bureau. Asian American, Native Hawaiian and Pacific Islander heritage month: May 2023. <https://www.census.gov/newsroom/facts-for-features/2023/asian-american-pacific-islander.html> Published 2023. Accessed August 9, 2023.
2. Department of Veterans Affairs. National Center for Veterans Analysis and Statistics. Population table—the nation: race/ethnicity. [https://www.va.gov/vetdata/veteran\\_population.asp](https://www.va.gov/vetdata/veteran_population.asp) Published 2022. Accessed August 9, 2023.
3. Department of Veterans Affairs. 2022 National Veteran Suicide Prevention Annual Report: data appendix. [https://www.mentalhealth.va.gov/docs/data-sheets/2020/2001-2020-National-Data-Appendix\\_508.xlsx](https://www.mentalhealth.va.gov/docs/data-sheets/2020/2001-2020-National-Data-Appendix_508.xlsx) Published 2022. Accessed August 9, 2023.
4. Department of Veterans Affairs. 2022 National Veteran Suicide Prevention Annual Report. [https://www.mentalhealth.va.gov/docs/data-sheets/2020/2001-2020-National-Data-Appendix\\_508.xlsx](https://www.mentalhealth.va.gov/docs/data-sheets/2020/2001-2020-National-Data-Appendix_508.xlsx) Published 2022. Accessed August 9, 2023.
5. Canetto SS. Language, culture, gender, and intersectionalities in suicide theory, research, and prevention: challenges and changes. *Suicide Life Threat Behav.* 2021;51(6):1045–1054. <https://doi.org/10.1111/sltb.12758>.
6. VA Information Resource Center. United States Veterans Eligibility Trends and Statistics (USVETS): a new data source with socioeconomic variables. [https://www.hsrd.research.va.gov/for\\_researchers/cyber\\_seminars/archives/3626-notes.pdf](https://www.hsrd.research.va.gov/for_researchers/cyber_seminars/archives/3626-notes.pdf). Accessed September 30, 2023.
7. Mohatt NV, Hoffmire CA, Schneider AL, et al. Suicide among American Indian and Alaska Native Veterans who use Veterans Health Administration care: 2004–2018. *Med Care.* 2022;60(4):275–278. <https://doi.org/10.1097/MLR.0000000000001656>.



8. Department of Veterans Affairs. 2001-2019-National-Data-Appendix. [https://www.mentalhealth.va.gov/docs/data-sheets/2019/2001-2019-National-Data-Appendix\\_508.xlsx](https://www.mentalhealth.va.gov/docs/data-sheets/2019/2001-2019-National-Data-Appendix_508.xlsx) Published 2021. Accessed August 9, 2023.
9. U.S. Census Bureau. Population by age, sex, race, and Hispanic or Latino origin for the United States: 2000. <https://www.census.gov/data/tables/2000/dec/phc-t-09.html> Published 2001. Accessed August 9, 2023.
10. Department of Veterans Affairs. 2021 National Veteran Suicide Prevention Annual Report. <https://www.mentalhealth.va.gov/docs/data-sheets/2021/2021-National-Veteran-Suicide-Prevention-Annual-Report-FINAL-9-8-21.pdf> Published 2021. Accessed August 9, 2023.
11. Department of Veterans Affairs. Table 3L: VETPOP2018 living veterans by race/ethnicity, gender, 2018-2048. [https://www.va.gov/vetdata/docs/Demographics/New\\_Vetpop\\_Model/3L\\_VetPop2018\\_Race\\_Ethnicity\\_National.xlsx](https://www.va.gov/vetdata/docs/Demographics/New_Vetpop_Model/3L_VetPop2018_Race_Ethnicity_National.xlsx) Published 2021. Accessed August 9, 2023.
12. Tsai J, Kong G. Mental health of Asian American and Pacific Islander military veterans: brief review of an understudied group. *Mil Med*. 2012;177(11):1438–1444. <https://doi.org/10.7205/MILMED-D-12-00214>.
13. Curtin SC, Warner M, Hedegaard H. Suicide rates for females and males by race and ethnicity: United States, 1999 and 2014. Published 2016. <https://stacks.cdc.gov/view/cdc/39033> Accessed August 9, 2023.
14. Curtin SC, Hedegaard H. Suicide rates for females and males by race and ethnicity: United States, 1999 and 2017. <https://stacks.cdc.gov/view/cdc/79168> Published 2019. Accessed August 9, 2023.
15. Ramchand R, Gordon JA, Pearson JL. Trends in suicide rates by race and ethnicity in the United States. *JAMA Netw Open*. 2021;4(5):e2111563. <https://doi.org/10.1001/jamanetworkopen.2021.11563>.
16. Stone DM, Mack KA, Qualters J. Notes from the field: recent changes in suicide rates, by race and ethnicity and age group—United States, 2021. *MMWR Morb Mortal Wkly Rep*. 2023;72(6):160–162. <https://doi.org/10.15585/mmwr.mm7206a4>.
17. Canetto SS, Sakinofsky I. The gender paradox in suicide. *Suicide Life Threat Behav*. 1998;28(1):1–23. <https://doi.org/10.1111/sltb.12758>.
18. Wong YJ, Deng K, Lee CS, Grimes J, Li PF. Asian Pacific Islander Americans' and White Americans' suicide methods. *Asian Am J Psychol*. 2018;9(4):318–326. <https://doi.org/10.1037/aap0000127>.
19. Hunter AA, DiVietro S, Boyer M, Burnham K, Chenard D, Rogers SC. The practice of lethal means restriction counseling in US emergency departments to reduce suicide risk: a systematic review of the literature. *Inj Epidemiol*. 2021;8(1):1–7. <https://doi.org/10.1186/s40621-021-00347-5>.
20. Defense Suicide Prevention Office. Lethal means safety for military service members and their families. [https://www.dspo.mil/Portals/113/Documents/DSPO%20Lethal%20Means%20Safety%20Guide%20for%20Military%20Service%20Members%20and%20Their%20Families\\_v34\\_FINAL.pdf?ver=AF6RRG7pGAicAqjtQQDyVg%3D%3D](https://www.dspo.mil/Portals/113/Documents/DSPO%20Lethal%20Means%20Safety%20Guide%20for%20Military%20Service%20Members%20and%20Their%20Families_v34_FINAL.pdf?ver=AF6RRG7pGAicAqjtQQDyVg%3D%3D) Published 2018. Accessed August 9, 2023.
21. Department of Veterans Affairs. Reducing firearm and other household safety risks for veterans and their families. [https://www.mentalhealth.va.gov/suicide\\_prevention/docs/Lethal-Means-Brochure-508.pdf](https://www.mentalhealth.va.gov/suicide_prevention/docs/Lethal-Means-Brochure-508.pdf) Published 2022. Accessed August 9, 2023.
22. Bailey ZD, Krieger N, Agénor M, Graves J, Linos N, Bassett MT. Structural racism and health inequities in the USA: evidence and interventions. *Lancet*. 2017;389(10077):1453–1463. [https://doi.org/10.1016/S0140-6736\(17\)30569-X](https://doi.org/10.1016/S0140-6736(17)30569-X).
23. Rosario-Williams B, Rowe-Harriott S, Ray M, Jeglic E, Miranda R. Factors precipitating suicide attempts vary across race. *J Am Coll Health*. 2022;70(2):568–574. <https://doi.org/10.1080/07448481.2020.1757680>.
24. Keum BT, Wong MJ, Salim-Eissa R. Gendered racial microaggressions, internalized racism, and suicidal ideation among emerging adult Asian American women. *Int J Soc Psychiatry*. 2023;69(2):342–350. <https://doi.org/10.1177/00207640221089536>.
25. Chu J, Lin M, Akutsu PD, Joshi SV, Yang LH. Hidden suicidal ideation or intent among Asian American Pacific Islanders: a cultural phenomenon associated with greater suicide severity. *Asian Am J Psychol*. 2018;9(4):262–269. <https://doi.org/10.1037/aap0000134>.
26. Spark TL, Kreisel C, Brenner LA, Hoffmire CA, Monteith LL. Putting it on a map: geographic visualization to inform suicide prevention in Asian, Native Hawaiian and Pacific Islander Veterans. *Asian J Psychiatr*. 2022;73:103125. <https://doi.org/10.1016/j.ajp.2022.103125>.
27. Perng W, Dhaliwal SK. Anti-Asian racism and COVID-19: how it started, how it is going, and what we can do. *Epidemiology*. 2022;33(3):379–382. <https://doi.org/10.1097/EDE.0000000000001458>.
28. Hernandez SE, Sylling PW, Mor MK, et al. Developing an algorithm for combining race and ethnicity data sources in the Veterans Health Administration. *Mil Med*. 2020;185(3-4):e495–e500. <https://doi.org/10.1093/milmed/usz322>.
29. Budiman A, Ruiz NG. Key facts about Asian Americans, a diverse and growing population. Pew Research Center. <https://www.pewresearch.org/fact-tank/2021/04/29/key-facts-about-asian-americans/> Published 2021. Accessed August 2, 2023.
30. Chau V, Chan P. One size does not fit all: appreciating the diversity of Asian Americans, Native Hawaiians, and Pacific Islanders (AANHPIs) and the implications for mental health. SAMHSA. <https://www.samhsa.gov/blog/one-size-does-not-fit-all-appreciating-diversity-asian-americans-native-hawaiians-pacific> Published 2021. Accessed August 9, 2023.
31. Kuroki Y. Comparison of suicide rates among Asian Americans in 2000 and 2010. *Omega*. 2018;77(4):404–411. <https://doi.org/10.1177/0030222816678425>.
32. Wong YJ, Vaughan EL, Liu T, Chang TK. Asian Americans' proportion of life in the United States and suicide ideation: the moderating effects of ethnic subgroups. *Asian Am J Psychol*. 2014;5(3):237–242. <https://doi.org/10.1037/a0033283>.
33. Kanaya AM, Hsing AW, Panapasa SV, et al. Knowledge gaps, challenges, and opportunities in health and prevention research for Asian Americans, Native Hawaiians, and Pacific Islanders: a report from the 2021 National Institutes of Health Workshop. *Ann Intern Med*. 2022;175(4):574–589. <https://doi.org/10.7326/M21-3729>.
34. Holland AT, Palaniappan LP. Problems with the collection and interpretation of Asian-American health data: omission, aggregation, and extrapolation. *Ann Epidemiol*. 2012;22(6):397–405. <https://doi.org/10.1016/j.annepidem.2012.04.001>.
35. Oh H, Du J, Smith L, Koyanagi A. Mental health differences between multiracial and monoracial college students in the United States: emerging racial disparities. *Int J Soc Psychiatry*. 2022;69(3):744–751. <https://doi.org/10.1177/00207640221135817>.
36. Bahraini NH, Adams RS, Caban J, et al. Racial and ethnic differences in deaths by suicide, drug overdose, and opioid-related overdose in a national sample of military members with mild traumatic brain injury, 1999–2019. *J Head Trauma Rehabil*. 2023;38(2):114–124. <https://doi.org/10.1097/HTR.0000000000000829>.
37. Department of Veteran Affairs, National Center for Veterans Analysis and Statistics. Guam. [https://www.va.gov/vetdata/veteran\\_population.asp](https://www.va.gov/vetdata/veteran_population.asp) Published 2018. Accessed August 9, 2023.
38. President's Advisory Commission on Asian Americans and Pacific Islanders. A report on the welfare of Asian Americans and Pacific Islanders serving in the United States military. [https://www.ppalp.org/resources/Documents/Commission%20Report%20on%20AAPI%20Mil%20and%20Vets%20\(11%20Nov%202017\)%20\(v1.0\).pdf](https://www.ppalp.org/resources/Documents/Commission%20Report%20on%20AAPI%20Mil%20and%20Vets%20(11%20Nov%202017)%20(v1.0).pdf) Published 2017. Accessed August 9, 2023.
39. Guam State Epidemiological Outcomes Workgroup. Suicide in Guam, 2020. <https://v2021a.peaceguam.org/sites/default/files/Suicide%20in%20Guam%20C%202020%20-%20Guam%20SEOW.pdf?theme=peace> Published 2021. Accessed August 9, 2023.
40. Mathieu S, De Leo D, Koo YW, et al. Suicide and suicide attempts in the Pacific Islands: a systematic literature review. *Lancet Reg Health West Pac*. 2021;17:100283. <https://doi.org/10.1016/j.lanwpc.2021.100283>.
41. Monteith LL, Holliday R, Iglesias CI, et al. Suicide risk and prevention in Guam: clinical and research considerations and a call to action. *Asian J Psychiatr*. 2023;103546. <https://doi.org/10.1016/j.ajp.2023.103546>.