OPEN

Suicide Among American Indian and Alaska Native Veterans Who Use Veterans Health Administration Care

2004–2018

Nathaniel V. Mohatt, PhD,†‡ Claire A. Hoffmire, PhD,*† Alexandra L. Schneider, BA,* Cynthia W. Goss, MA,§‖ Jay H. Shore, MD, MPH,§‖ Talia L. Spark, PhD, MS,*† and Carol E. Kaufman, PhD§‖¶*

Background: American Indian and Alaska Natives (AI/ANs) veterans may be at elevated risk for suicide, but little is known about suicide among this population.

Methods: We conducted a retrospective cohort analysis of AI/AN veterans who received health care services provided or paid for by the Veterans Health Administration (VHA) between October 1, 2002, and September 30, 2014, and who were alive as of September 30, 2003. Age-specific and age-adjusted suicide rates through 2018, per 100,000 person-years (PY) at risk and 95% confidence intervals were computed.

Results: Age-adjusted suicide rates among AI/AN veterans in this cohort more than doubled (19.1–47.0/100,000 PY) over the 15-year observation period. In the most recent observation period (2014–2018), the age-adjusted suicide rate was 47.0 per 100,000 PY, with the youngest age group (18–39) exhibiting the highest suicide rate (66.0/100,000 PY). The most frequently used lethal means was firearms (58.8%), followed by suffocation (19.3%), poisoning (17.2%), and other (4.7%).

Conclusions: Results suggest that: (1) suicide is an increasing problem among AI/AN VHA veterans; and (2) younger AI/AN VHA veterans are at particularly high risk and warrant focused prevention efforts. Findings are similar to those observed in general AI/AN population. There is a compelling need to review and strengthen VHA suicide prevention efforts directed towards AI/AN veterans.

Key Words: suicide rates, veteran, American Indian and Alaska Native, Native veteran, lethal means

(*Med Care* 2022;60: 275–278)

With veteran suicide rates in 2018 ~1.5 times greater than suicide rates in the nonveteran adult population,[1] the US Department of Veterans Affairs (VA) has made suicide prevention the top clinical priority. To reduce veteran suicide, the Veterans Health Administration (VHA) is taking a public health approach to suicide prevention, including universal, selective, and indicated strategies.[2] Selective interventions target specific groups of at-risk veterans, such as racial groups for which there is an identified disparity in suicide deaths. Therefore, assessing suicide rates among racial and ethnic minorities is a critical surveillance strategy for the VA's suicide prevention program.[1]

American Indian and Alaska Natives (AI/ANs) in the general population have the highest rates of suicide of all race groups in the United States, as well as the most rapidly growing suicide rates.[3,4] The reasons for high rates of suicide among AI/AN people are complex, with many interacting factors. Prior research has documented risk factors for AI/AN suicide across the social-ecological model, including individual experiences of trauma, substance use, and social isolation; community factors such as poverty and limited access to health care; and experiences unique to AI/AN people and communities such as historical trauma.[5–7] Such experiences were caused and perpetuated by war and genocide, broken treaties, and policies harmful to Native people

From the *US Department of Veterans Affairs (VA) Rocky Mountain Mental Illness Research, Education, and Clinical Center for Suicide Prevention; †Department of Physical Medicine and Rehabilitation, University of Colorado Anschutz Medical Campus, Aurora, CO; ‡Department of Psychiatry, Yale School of Medicine, New Haven, CT; §VA Office of Rural Health's (ORH) Veterans Rural Health Resource Center Salt Lake City, Salt Lake City, UT; ‖Centers for American Indian and Alaska Native Health, University of Colorado Anschutz Medical Campus; and ¶Department of Community and Behavioral Health, Colorado School of Public Health, University of Colorado Anschutz Medical Campus, Aurora, CO.

Supported by the US Department of Veterans Affairs Office of Mental Health and Suicide Prevention and the Office of Rural Health. Visit www.ruralhealth.va.gov to learn more. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the US Department of Veterans Affairs.

The authors declare no conflict of interest.

Correspondence to: Nathaniel V. Mohatt, PhD, Rocky Mountain MIRECC, 1700 North Wheeling Street, Building G3, Room 153, Aurora, CO 80045. E-mail: nathaniel.mohatt@va.gov.

ISSN: 0025-7079/22/6004-0275

and communities, which prevented the dissemination of protective cultural values and practices.[8–10]

Given elevated rates of suicide and exposure to risk factors among both veterans and AI/AN populations, AI/AN veterans may be an important group for selective suicide prevention strategies. AI/AN veterans have a higher prevalence of mental health disorders compared with White veterans[11,12] and among all veterans, the prevalence of suicidal ideation is highest for those reporting a diagnosis of depression, anxiety, or posttraumatic stress disorder.[13] The 2020 National Veteran Suicide Prevention Annual Report provides a first look at suicide in this population, documenting growing AI/AN veteran suicide rates from 2005 to 2018.[1] However, this report does not provide detailed analyses important for understanding risk within this population. Despite these emerging findings on mental health and growing suicide rates among AI/AN veterans, there is very limited data and research on suicide among AI/AN veterans.[5]

To date, there is no published data on suicide among AI/AN veterans who received health care services provided or paid for by the VHA (VHA veterans). To support effective VHA suicide prevention services for AI/AN veterans, we need to first understand the basic context of suicide risk among VHA veterans. Therefore, we present an analysis of suicide rates in this population over time, assess suicide rates by age (ie, calculate age-specific and age-adjusted suicide rates), and examine the most common lethal means used within this population.

METHODS

We conducted a retrospective cohort analysis of AI/AN veterans who received care provided by the VHA between October 1, 2002, and September 30, 2014 [ie, fiscal years (FY) 2003–2014] and who were alive as of September 30, 2003 (end of FY 04) using VHA clinical and administrative records. AI/AN veterans were defined as those with any VHA record indicating AI/AN race, including veterans with single race AI/AN identification as well as those who identified with other races (multirace AI/AN). Veterans in the cohort were not excluded based on place of residence and live in urban and rural locations, as well as tribal and nontribal communities. Veterans in the cohort were followed until death or until September 30, 2018, whichever came first. Sample demographics at study start date or first VHA encounter are provided in Table 1, including age, sex, and single versus multirace identification. Review and approval for this study was provided by the Colorado Multiple Institution Review Board and the Eastern Colorado VA Health Care System Research and Development Committee.

Age-specific and age-adjusted (using the 2000 US Standard Population) suicide rates, per 100,000 person-years (PY) at risk and 95% confidence intervals were computed for this cohort for the years 2004–2018, in 5-year observation periods: 2004–2008, 2009–2013, and 2014–2018.[14] Five-year observation periods were employed to obtain reliable suicide rates by age group; shorter observation periods would have limited the ability to assess suicide rates by age group in the early years of the study during which there were fewer deaths. Rates were calculated for 3 age groups: 18–39, 40–59, and 60+. These age groups were chosen by collapsing standard approximate 10-year adult age groups into 3 groups aligning with younger, middle-aged, and older veterans (18–29+30–39; 40–49+50–59; 60–69+70–79+80–84). Veterans aged 89 years and older at the start of the study timeframe were excluded based on institutional review board requirements.

TABLE 1. Sample Age, Sex, and Racial Identification

Characteristic	AI/AN Cohort (N = 86,921) [n (%)]
Age (y)	
18–39	24,263 (27.91)
40–59	38,873 (44.72)
60+	23,785 (27.36)
Sex	
Female	9197 (10.58)
Male	77,724 (89.42)
Race	
Single race AI/AN	58,156 (66.91)
Multirace AN/AN	28,765 (33.09)

Demographics are provided for individuals at entry into the study, which is based on either study start date (October 1, 2003) or first date of a Veterans Affairs record.
AI/AN indicates American Indian and Alaska Native.

Date and cause of death were determined using the Centers for Disease Control's National Death Index records housed within the VA/DoD Mortality Data Repository. Suicides included *International Classification of Diseases, 10th Edition* (ICD-10) underlying cause-of-death codes U03, X60–84, and Y87.0, with codes X72–X74 being classified as firearms, X60–X69 as poisoning, X70 as suffocation, and all others considered "Other."[14] Confidence intervals for age-specific rates were calculated assuming a binomial distribution under the homogeneity assumption, while the age-adjusted confidence intervals were a weighted average of the age-specific rates. Sex-stratified and sex-adjusted suicide rates were not computed due to sample size restrictions.

For each veteran, within each observation period, PY at risk were calculated by subtracting the veterans' observation start date (day before first VHA encounter or day before the beginning of the specific time period) from their observation end date (date of death or end of the specific time period).[15] Furthermore, PY at risk were calculated for each age group within each observation period; veterans moved across age groups within a given period, as appropriate. Individuals whose first VHA use occurred on the date of death (n = 3) were excluded as they did not contribute any person-time and were not VHA-using veterans before their death. Rates calculated with counts < 10 are not reported, those < 20 are reported but noted as unreliable.

RESULTS

Age-adjusted suicide rates among AI/AN VHA veterans in this study cohort more than doubled (2.46-fold increase) from the first (19.1/100,000 PY in 2004–2008) to the last observation period (47.0/100,000 PY in 2014–2018). Table 2 provides results of suicide deaths and rates by age and observation period.

TABLE 2. American Indian/Alaska Native Veterans Health Administration Veterans Cohort Suicide Rates Per 100,000 Person-years by Age and Period

	18–39 Years		40–59 Years		60+ Years		Total (All Ages)		
5-Year Range	# of Deaths	Rate (95% CI)	# of Deaths	Rate (95% CI)	# of Deaths	Rate (95% CI)	# of Deaths	Crude Rate (95% CI)	Age-adjusted Rate (95% CI)
2004–2008	< 10	*	21	20.0 (11.4, 28.5)	10	12.8† (4.9, 20.8)	39	17.7 (12.2, 23.3)	19.1 (12.6, 28.4)
2009–2013	27	39.1 (24.3, 53.8)	38	33.4 (22.8, 44.1)	33	22.7 (15.0, 30.4)	98	29.9 (24.0, 35.8)	33.4 (26.4, 42.0)
2014–2018	52	66.0 (48.1, 84.0)	41	36.9 (25.6, 48.3)	49	27.3 (19.6, 34.9)	142	38.4 (32.1, 44.8)	47.0 (38.7, 56.7)
Total	87	47.1 (37.2, 57.0)	100	30.3 (24.4, 36.3)	92	22.8 (18.2, 27.5)	279	30.4 (26.8, 34.0)	35.7 (31.1, 40.9)

*Numbers too small to calculate (ie, count under 10).
†Unreliable rate (ie, count under 20).
CI indicates confidence interval.

In the most recent observation period (2014–2018), the age-adjusted suicide rate (per 100,000 PY) and 95% confidence interval was 47.0 (38.7, 56.7). The lowest suicide rate was observed for the oldest age group (60+) at 27.3 (19.6, 34.9) during the final study period (2014–2018). Conversely, the youngest age group (18–39) exhibited the highest suicide rate at 66.0 (48.1, 84.0) during the final study period (2014–2018). The youngest age group also exhibited the largest growth in suicide deaths and rates—from <10 deaths in years 2004–2008 to 52 in years 2014–2018 and a doubling in suicide rate (per 100,000 PY) from the second (2009–2013) to third (2014–2018) study periods.

The most frequently used lethal means were firearms (58.8%), followed by suffocation (19.4%), poisoning (17.2%), and other (4.7%) (Table 3). When looking at lethal means used by age group, older (60+ y) AI/AN veterans appear more likely to use firearms (73.9% of deaths) compared with those 18–39 years old (57.5% of deaths) or 40–59 years old 46% of deaths. Likewise, the middle age group (40–59 y) used poisoning at a higher rate than the other 2 age groups (26.0% of deaths compared with 8.1% and 16.3% of deaths).

DISCUSSION

Our results suggest that suicide rates among AI/AN VHA veterans have risen substantially from 2004 to 2018. Compared with VA-published data on all VHA veterans, suicide rates may be growing more rapidly among AI/ANs (146% vs. 32% over a similar time period).[16] AI/AN VHA veterans appear to have experienced higher age-adjusted suicide rates from 2014 to 2018 (47.0/100,000) compared with a range from 36.7 (2014) to 39.5 (2018) among all VHA veterans.[16] Also, AI/AN VHA veterans who die by suicide may be less likely to die by firearms (58.8% of decedents) compared with all veterans (68.2% of decedents), with the exception of older AI/AN VHA veterans. However, AI/AN VHA veteran suicide decedents are more likely to die by firearm compared with nonveteran AI/AN suicide decedents.[16]

TABLE 3. Lethal Means Used Among American Indian/Alaska Native Veterans Health Administration Veteran Suicide Decedents

	Age Groups (% Deaths)			
Method	18–39	40–59	60+	Total (% Deaths)
Firearm	57.5	46.0	73.9	58.8
Suffocation	26.4	23.0	8.7	19.4
Poisoning	8.1	26.0	16.3	17.2
Other	8.1	5.0	1.1	4.7

Accounting for both risk (rate) and burden (number of deaths) is critical to planning suicide prevention programs. Similar to observations among all veterans[1] and in the general AI/AN population,[3] we found higher rates for younger AI/AN VHA veterans. The risk for suicide is highest during the year post-discharge from military service[13,17] which may partially explain why suicide rates are highest among younger veterans who are more likely to be recently separated from service. However, among all veterans regardless of race, the burden of suicide is highest in the 55- to 74-year-old age group,[1] whereas the youngest age group of AI/AN VHA veterans had the highest burden in the last study period (2014–2018). For AI/AN VHA veterans, risk and burden are both highest in the youngest age group.

These results comport with general national trends in suicide among AI/ANs. AI/ANs have the fastest-growing rates of suicide compared with other race/ethnic groups, and younger AI/ANs have the highest suicide rates compared with other AI/AN age groups as well as compared with other racial/ethnic groups.[3,4] The reasons for these trends are not fully understood; however, various studies have documented that AI/AN youth have higher rates of childhood adversity, mental health disorders, and substance use and are unlikely to receive any behavioral health services regardless of need.[6] Therefore, future research on AI/AN veterans suicide will need to explore the complex relationships between suicide and premilitary community and childhood risk factors (eg, adverse childhood events), military service-related risk factors (eg, increased rates of combat exposure among AI/AN service members), post-service individual and community challenges (eg, substance use, access to care), and other health risks and causes of early death among AI/AN veterans. Likewise, this study's findings on lethal means are consistent with the literature—AI/ANs use firearms in suicides less than White Americans.[4] These findings indicate that although firearms remain an important focus for lethal means safety for AI/AN VHA veterans, suffocation and poisoning are important to address as well.

These findings should be tempered by the limitations of the data. First, the data we present only include AI/AN veterans accessing VHA services from FY03 to FY14, and we did not have the necessary data to stratify by rurality. Approximately two third of all veteran suicide deaths are among

non–VHA-using veterans, and only about half of AI/AN veterans access VHA care; therefore, these findings cannot be used to infer suicide rates among AI/AN veterans who do not use VHA care.[18] Furthermore, given that suicide rates are highest among rural AI/ANs[3,4] and rural veterans,[19] and AI/AN veterans are more likely to live in rural areas,[11] it will be important for future analyses to compare suicide rates among rural versus urban AI/AN veterans. Second, due to AI/ANs being one of the smallest race groups among veterans, we were unable to calculate to calculate rates stratified or adjusted by both age and sex. In addition, small numbers of deaths in the first study observation period (2004–2008) could lead to less stable estimates of age-specific rates during the first study period. Third, we did not conduct comparative analyses to other race groups; therefore, conclusions regarding health disparities are limited. Finally, the completeness and accuracy of race data in health care records is a well-documented challenge.[20] Therefore, it is important that we use the best available data, and the VHA's Corporate Data Warehouse (CDW), which we use in this study, provides the most accurate comprehensive, non–survey-based data set for identifying veterans by race and ethnicity.[20]

The results we present offer a first look at AI/AN VHA veteran suicide rates by age group. A critical next step will be to replicate this analysis among all veterans, regardless of VHA use, and to develop direct comparative analyses of AI/AN age-specific suicide rates to other race/ethnic groups. Doing so will also provide a larger analytic cohort and the potential to assess AI/AN veteran suicide rates for specific years, regional variability, and by rurality, sex, and use of VHA care. Although these findings cannot be generalized to the AI/AN veteran population, they are a critical first step towards addressing health equity and planning services for VHA veterans. Overall, the current analysis identifies important patterns: (1) suicide is a rapidly growing problem among AI/AN VHA veterans; (2) younger AI/AN veterans are an important focus for prevention effort; and (3) means safety interventions should address firearms as well as poisoning and suffocation.

The National Strategy for Preventing Veteran Suicide emphasizes the importance of developing programs to reach all veterans, including selective populations at increased risk.[2] When considering suicide disparities experienced by AI/AN people, it is critical to acknowledge the role of historical trauma and persistent structural inequities in creating and maintaining the disparity.[5,6,21] Conversely, Native American communities possess many strengths that can support effective suicide prevention.[6] Therefore, it is imperative for the VA to partner with Native communities to address the inequities while promoting cultural survivance[22] and capacity development.[6] Reducing suicide deaths among AI/AN veterans will require careful attention to culture-specific risk and protective factors and tailoring VHA suicide prevention to meet the needs of AI/AN veterans and their communities.[5] Our results suggest a compelling need to review and strengthen suicide prevention efforts for AI/AN veterans.

REFERENCES

1. US Department of Veterans Affairs Office of Mental Health and Suicide Prevention. 2020 National Veteran Suicide Prevention Annual Report; 2020. Available at: www.mentalhealth.va.gov/docs/data-sheets/2019/2019_National_Veteran_Suicide_Prevention_Annual_Report_508.pdf. Accessed October 22, 2021.
2. US Department of Veterans Affairs. National Strategy for Preventing Veteran Suicide 2018–2028; 2018.
3. Leavitt RA, Ertl A, Sheats K, et al. Suicides among American Indian/Alaska Natives—National Violent Death Reporting System, 18 States, 2003–2014. *MMWR Morb Mortal Wkly Rep*. 2018;67:237–242.
4. Ivey-Stephenson AZ, Crosby AE, Jack SP, et al. Suicide trends among and within urbanization levels by sex, race/ethnicity, age group, and mechanism of death—United States, 2001–2015. *MMWR Surveill Summ*. 2017;66:1–8.
5. O'Keefe VM, Reger GM. Suicide among American Indian/Alaska native military service members and veterans. *Psychol Serv*. 2017;14:289–294.
6. Wexler L, Chandler M, Gone JP, et al. Advancing Suicide Prevention research with rural American Indian and Alaska Native populations. *Am J Public Health*. 2015;105:891–899.
7. Wexler LM, Gone JP. Culturally responsive suicide prevention in indigenous communities: unexamined assumptions and new possibilities. *Am J Public Health*. 2012;102:800–806.
8. Walters KL, Simoni JM, Evans-Campbell T. Substance use among American Indians and Alaska natives: incorporating culture in an "indigenist" stress-coping paradigm. *Public Health Rep*. 2002;117(suppl 1): S104–S117.
9. Fast E, Collin-Vézina D. Historical trauma, race-based trauma and resilience of indigenous peoples: a literature review. *First Peoples Child Fam Rev*. 2020;5:126–136.
10. Goodkind JR, Hess JM, Gorman B, et al. "We're still in a struggle": Diné resilience, survival, historical trauma, and healing. *Qual Health Res*. 2012;22:1019–1036.
11. Kaufman CE, Asdigian NL, Bear UR, et al. Rural and Urban American Indian and Alaska Native Veteran Health disparities: a population-based study. *J Racial Ethn Health Disparities*. 2020;7:1071–1078.
12. Noe TD, Kaufman CE, Brooks EA, et al. Addressing the health needs of rural native veterans: assessment and recommendations. *J Rural Soc Sci*. 2011;26:137–156.
13. Bossarte RM, Knox KL, Piegari R, et al. Prevalence and characteristics of suicide ideation and attempts among active military and veteran participants in a national health survey. *Am J Public Health*. 2012;102 (suppl 1):38–40.
14. Curtin LR, Klein RJ. Direct standardization (age-adjusted death rates). *Healthy People 2000 Stat Notes*. 1995;6:1–10.
15. Rothman KJ, Greenland S, Lash T, et al. *Modern Epidemiology Third*. Philidephia, PA: Lippincott Williams & Wilkins; 2008.
16. United States Department of Veterans Affairs: Office of Mental Health and Suicide Prevention. 2020 National Veteran Suicide Prevention Annual Report: 2005–2018 National Data Appendix; 2020. Available at: www.mentalhealth.va.gov/suicide_prevention/data.asp. Accessed October 22, 2021.
17. Ravindran C, Morley SW, Stephens BM, et al. Association of suicide risk with transition to civilian life among US Military Service members. *JAMA Netw Open*. 2020;3:1–10.
18. Kramer BJ, Wang M, Jouldjian S, et al. Veterans Health Administration and Indian Health Service: healthcare utilization by Indian Health Service enrollees. *Med Care*. 2009;47:670–676.
19. McCarthy JF, Blow FC, Ignacio RV, et al. Suicide among patients in the Veterans Affairs Health System: rural-urban differences in rates, risks, and methods. *Am J Public Health*. 2012;102(suppl 1):111–118.
20. 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:e495–e500.
21. Mohatt NV, Thompson AB, Thai ND, et al. Historical trauma as public narrative: a conceptual review of how history impacts present-day health. *Soc Sci Med*. 2014;106:128–136.
22. Allen J, Mohatt GV, Beehler S, et al. People awakening: collaborative research to develop cultural strategies for prevention in community intervention. *Am J Community Psychol*. 2014;54:100–111.