

AN ABSTRACT OF THE DISSERTATION OF

Sydelle N. Harrison for the degree of Doctor of Philosophy in Public Health presented on June 2, 2022.

Title: Homicide, Deaths of Undetermined Intent, and Legal Intervention: A Comparison of American Indian and Alaska Native Violent Deaths by Multilevel Place of Death

Abstract approved: _____

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Violent deaths are a leading cause of mortality in the United States and research suggests American Indians and Alaska Natives (AI/AN) are disproportionately impacted compared to all other racial and ethnic groups. Little is known about the true magnitude of the serious threat of violence mortality in AI/AN communities across the United States or differences between separate manners of interpersonal violent death, including homicide, undetermined intent (UD), and legal intervention (LI). Significant gaps in data access, quality, and reliability limit the understanding of contextual and historical factors unique to Indian Country and citizens of Tribal nations, a landscape which research has demonstrated is a key factor in coping and healing from historical and modern violence for AI/AN communities. Guided by a theoretical framework and a historical lens, this dissertation is comprised of two aims to characterize the magnitude of interpersonal violent deaths across the U.S. using multiple levels of place and data from the National Violent Deaths Reporting System (NVDRS).

Our first aim examines mortality rates of NVDRS homicide, undetermined intent (UD), and legal intervention (LI) among the AI/AN and compares them to non-Hispanic whites (NHW) in three separate places: 1) national; 2) state; and 3) region. Data were linked to provide a

meaningful distinction between deaths that occurred on reservation (or other Tribal) lands (RL) and all other non-Tribal lands (NTL). Violent deaths among the small and only recently disaggregated AI/AN population are further marginalized due to restrictions that precluded rate calculations at the state and regional level, including all AI/AN LIs. In all but one state and all regions where AI/AN violent deaths met reporting standards, rates were higher than NHWs in the same state or region across all manners of death. Multivariable linear regression models showed there was a statistically significant relationship between rates of violent death, race/ethnicity, and place for homicide and UD.

The second aim of this dissertation assessed the social, individual, incident, and system-level characteristics of AI/AN homicide, UD, and LI across all available years of NVDRS data (2005-2020) and compared them by place (RL/NTL) to NHWs. Approximately 48% of all AI/AN deaths occurred in places on or near RL, despite estimates from Tribal-serving organizations that only 30%-40% of all AI/AN live on RL. AI/AN victims of homicide, UD, and LI were mostly males, younger, and less educated than NHWs. The predominant weapon type used in all AI/AN violent homicide and LI deaths was a firearm (47.6% and 94.6% respectively) with higher frequencies reported on NTL for homicide (57.6%) and NTL for LI (95.5%). The main weapon type for AI/AN UD was “unknown” (29.4%) compared to poisoning for NHWs (71.5%). Chi square tests of independence were performed to determine associations between autopsy, toxicology, and law enforcement narrative completion by race/ethnicity. AI/AN were slightly more likely to have an autopsy according to NVDRS data, while the odds of a toxicology were lower. The widest disparity was observed for presence of law enforcement narrative, where AI/AN were substantially less likely to have a law enforcement narrative reported for any manner of death, compared to NHWs.

Our findings of higher rates of violent death from homicide, UD, and LI across Indian Country compared to NHWs suggest there are significant public health improvements to be made to reach AI/AN communities. Lower age and educational achievement associated with AI/AN decedents indicate socioeconomic factors play a key role in the risk of violent death for AI/AN and existing resources may not sufficiently provide barriers to violence. The glaring issue of restricted access to violence data is an ongoing threat to data sovereignty for Tribal nations and will continue to impede intervention efforts, costing lives and stealing the futures of future generations of AI/ANs. Even with the limitations of our results through policy suppression, this work contributes to our most comprehensive view of violent deaths among AI/AN communities to date and acknowledges that these findings remain an undercount.

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Homicide, Deaths of Undetermined Intent, and Legal Intervention: A Comparison of American
Indian and Alaska Native Violent Deaths by Multilevel Place of Death

by
Sydelle N. Harrison

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I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

Sydelle N. Harrison, Author

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To my girls, without you and the unconditional love you teach me I may have ended up in this dataset. You are my biggest accomplishment. I would like to express my deepest appreciation to Dr. Irvin for allowing me to choose a project that was difficult but very important to me and for the constant support. I am also thankful to my committee for their unwavering support and for challenging me to think objectively about an emotional topic. Lastly, I'd like to acknowledge the many families and communities searching for answers and healing, my heart goes out to you.

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DEDICATION

This dissertation is dedicated to my mom, Pam Jones Harrison and grandmother,
Elizabeth Wacotsi Jones, and my brother, Johnathan Paul Harrison.

CHAPTER 1. INTRODUCTION

Overview and Context

The number of homicide victims continues to rise worldwide with 464,000 lives claimed in 2017 alone (UNODC, 2019). The United States reported 51,627 fatal incidents of violent death homicides in 2019 (Wilson, Liu, Lyons, et al., 2022). Rates for non-Hispanic Indigenous American Indian and Alaska Natives (AI/AN) were highest among all races for suicide (29.8 per 100,000) and legal intervention (LI [1.2 per 100,000]), second in homicide (12.2 per 100,000) and undetermined (UD [males =4.4 and females= 2.2 per 100,000]) only to Black people (Wilson, Liu, Lyons, et al., 2022). The specificity of intentional homicide is central to contributing to a broader understanding of violence and its known influences on “secondary victims” including family and communities of victims (UNDOC, 2019).

It is important to raise awareness to lesser understood violent deaths including UD and LI to better define their contribution to patterns of violence. Racial misclassification of AI/ANs in death certificate data that suggest disparities among the AI/AN population remains undercounted. Additionally, national AI/AN-specific death data was only disaggregated from the mixed “Other” category along with Asian, and Native Hawaiian and Pacific Islanders in 2005 (Minino et al., 2007). To further complicate the multifaceted circumstances surrounding violent AI/AN deaths, status as sovereign nations (especially those retaining traditional reservation and trust lands [RL]) within the U.S. introduces layers of legal jurisdiction that dictate death investigations incomparable to any other group in America.

Public Health Significance

Indigenous peoples have a verified record of habitation in America dating back over 15,000 years (Wade, 2019). For the last 500 years, these AI/AN populations have endured violent colonization leaving a patchwork of disparate social and economic disparities. Forced removal and relocation, nonconsensual sterilization of women, and continuous targeting of native children for adoption, foster care, and boarding schools caused an untold number of deaths and modeled violent behavior to generations of AI/ANs. The foundations of AI/AN families and communities were fractured, yet the colonial movement and their beneficiaries routinely deny responsibility for the resulting social and environmental traumas (Sheehan, et. al., 2010). The permanent chasm in the contemporary AI/AN population revolves around the remaining Tribal lands (reservation, trust, fee simple) and their distinct cultural pathways. Therefore, the importance of centering lands as a key factor of indigenous mortality is vital to understanding complex health behaviors and associated “therapeutic landscapes” (Basso, 1996; Carbaugh, 1999; Wendt and Gone, 2012).

There are 576 federally recognized Tribal nations and Alaska villages in the U.S. with control over 100 million acres in reservation, trust, and fee simple land (Azria et al., 2020). The AI/AN population is a fast-growing demographic having increased by 27% between 2000-2010 compared to 9.7% of the overall U.S. population. The 2020 decennial census saw an increase from 5.2 million to 8.5 million people identified as AI/AN along or with one other race (U.S. Census Bureau, 2020). Population statistics have historically been enforced by the dominant culture, this biased system constitutes where, and how AI/AN live (Finesca, 2012; Walter and Anderson, 2013). In the case of the U.S., control over this system is dominated by

male and white interests aimed at identifying and controlling proportions of otherness.

Further, these same systems determine whether AI/AN ancestry¹ can be claimed at all depending on the status of another white patriarchal construct, federal recognition.

Delegitimizing cultural connection for living AI/ANs fuels underrepresentation of the populous and forces extra effort to address misclassifications after death.

Indigeneity is centralized on the cultural reflexivity with the natural landscape and resources, to operationalize self-determination² over engagement, policy, and data management in Indian Country³. Thus, regionality and the dichotomous place designations based on sovereign reservation lands are important research considerations among indigenous populations in the U.S. Acknowledging regionality is common practice in academia to account for distinct, social, cultural, and environmental differences. Indigenous knowledge and traditional cultural practices maintained the health of AI/AN for thousands of years before colonial contact. These concepts are inextricably connected to relationship with the land, so place is an essential construct of indigenous health. Further narrowing comparisons by place in the form of reservation (and other Tribal) lands (RL) helps characterize systemic

¹ Levels of AI/AN ancestry can include 1) Federally-recognized Tribal Nations; 2) State-recognized Tribal Nations and Bands; 3) Terminated Federal or State-recognized Tribal Nations; 4) Non-Treaty Tribal Nations (nations who were not afforded the opportunity or refused to sign treaties with the United States in exchange for their land.

² Self-determination (PL 93-638) responsibilities of the U.S. government are to contract with the Tribes for programs, services, and construction project provided by the Bureau of Indian Affairs, oversight of Tribal audits, and to provide technical assistance to Tribes (U.S. Department of the Interior, n.d.)

³ “Indian Country” under 18 U.S. Code § 1151 is a legal term that means (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same (18 U.S. Code § 1151, 1948).

moderators such as social demographics and the potential differences in jurisdictional compliance involved in violent death investigation.

Violent deaths are classified by the Centers for Disease Control and Prevention as self-suicide, homicide, undetermined intent (UD), legal intervention (LI), and unintentional firearm. Much of the focus in AI/AN violence research has been channeled to the alarming rates of suicide, where AI/AN experience the highest rates of any race or ethnicity in the U.S., while homicide, UD, and LI remain less understood. Systemic obstacles to data collection for AI/AN create a blurred picture of the population demographics and compromise data validity for research purposes. The majority of national mortality data has excluded AI/AN (among other small U.S. racial groups) from disaggregated data reporting small populations collectively as “Other”. Small race classifications within the U.S. (i.e., AI/AN, Native Hawaiians and Pacific Islanders) share similarities in violent death disparity while data access issues continue to delay important scientific findings that could be used to allocate more resources to prevention efforts.

Aided by undercounting practices, vast resource deficits exist for reservation Tribes and urban Tribal-serving organizations restricting the ability to provide comprehensive social services to all Tribal citizens. In 2020, the National Congress of American Indians report on Tribal Nations and the United States (2020) stated 39% of Native peoples on reservations live in poverty, the highest rate in the country. The same report showed 38% of Alaska Tribal households lacked complete plumbing. Reservation homes lacking complete plumbing was 17 times higher than the national percentage (Azria et al., 2020). Still, residents of reservation and other Tribal lands account for only approximately 30% of the AI/AN population, while the majority live off reservations on non-Tribal lands (NTL). The external American

environment, especially in metropolitan areas, introduce additional layers of institutionalized racism as a result of decades of health prevention policy focusing on characteristics of the central mass (white populous) to move the national curve, whereby AI/AN who occupy the distant tails are overlooked.

Recent studies show homicide rates of 12.1 per 100,000 for AI/AN communities, four times those of non-Hispanic whites (NHW) at 2.8 per 100,000 (Herne, Maschino, & Graham-Phillips, 2016) and twice national averages for Native women (Petrosky et al., 2017). In 2018, the CDC found homicide was the third and sixth leading cause of death for AI/AN males and females between the ages 1-44 respectively (Murphy, Xu, Kochanek, Arias, & Tejada-Vera, 2021). Further, Herne et. al., (2016) noted regional differences with the highest rates reported in the Southwest region at 25.5 per 100,000. A closer look reveals more startling patterns of homicide for AI/AN communities. For example, the National Institute of Justice reported more than 80% AI/AN have experienced violence in their lifetime and more than 30% had experienced violence in the past year (Rosay, 2016). No recent publications could be found that address the impacts of undetermined intent (UD) deaths specific to the AI/AN population.

The innovation in this dissertation lies in three areas. First, the CDC's National Violent Death Reporting System is a unique system linking victim and alleged perpetrator (suspect) records associated with an incident of violent death in over 900 variables (CDC, 2021). Data access to the NVDRS recently (2019) expanded to include all U.S. states, providing this study the most comprehensive dataset available to investigate violent deaths. Second, including UD and LI deaths among AI/AN will give a wider picture of interpersonal violent death among AI/AN communities. At present, NVDRS has not been used to measure

these manners of death specific to the AI/AN population. Finally, linking zip code tabulation area (ZCTA) codes associated with reservation lands (RL) by a federal agency and examining demographic and social characteristics of decedents for both socio-geographic populations will provide finer detail to differences across Indian Country.

Conceptual Framework

The dissertation research was guided by literature reviews (Appendix) and integration of anomie theory (Durkheim, 1933; Merton, Merton, & Company, 1968), strain theory (Agnew, 1992, 2001, 2006), social learning theory (Bandura, 1978a), Messner, 2010), and resource theory (Goode, 1971) (see Appendix A for additional discussion on theory integration). This conceptual framework was used to provide context on the socio-geographic delineation of this study and links historical social antecedents, mediating structural and internal factors facilitators to lethally violent settings and behavior collectively conceptualized as intergenerational indigenous historical trauma (IHT) (Gone and Hartmann, 2019). An intersectional application of my conceptual model discussed in chapter 2 (see page 40) was used based on the availability of National Violent Death Reporting System (NVDRS) and linked geographic data. The central focus was to operationalize historical, cultural, and racial antecedents to Tribal sovereignty and self-determination through multilevel place designation.

Place is an essential determinant of health, and it is important to acknowledge that almost all cities were indigenous spaces first (Walter and Anderson, 2013). The systematic destruction of indigenous spaces to further an anti-indigenous worldview is important to understanding indigenous determinants of health. Implications of interpersonal violence are severe and cyclical, its effects both immediate and prolonged as a lifelong mediator of emotional, behavioral, and

physical health problems (Mercy et. al., 2017). On AI/AN reservations lands and villages (RL), incidents of violent death converge on places where centuries of external violence have rendered places and its people powerless based on racial classification. Disadvantaged pervasive violence is free to further stunt development, increase inequality, and erode human capital (WHO, 2008).

AI/AN populations of the U.S. each represent unique cultural and historical patterns reflective of their natural landscapes and resources. We acknowledge this distinction and operationalized place as a key construct in this study by including with the national reporting, delineations among our sample of decedents of violence by 1) state; 2) region; and 3) identified reservation lands (RL) and non-Tribal lands (NTL). The state and regional distinction allows for localizing potential factors associated with levels of violent death based on national fluctuations in interagency jurisdiction, access to resources, cultural differences, and variance in historical patterns of colonization (e.g., proximity to boarding schools or urban relocation sites). Severe institutional and structural limitations like stretched and disorganized jurisdictional policy, training, and response have precluded research from touching on differences between RL and NTL. By highlighting the distinction in violent deaths as a necessary component of indigenous research methodology, this study aims to provide a picture of the most updated status violent deaths by indigenous place of death identification.

Specific Aims

The goal of this dissertation was to 1) characterize cause-specific mortality rates of homicide and UD among the AI/AN population in the United States; 2) characterize differences by place of death (state, region, RL vs. NTL); and 3) compare results with a non-Hispanic Whites (NHW). These goals are aligned with the National Institutes of Health's research priority

to “address causes and consequences of injuries as well as how to bring about changes for people, their physical and social environments, and the health system to reduce the incidence and impact of injuries and violence across the lifespan and in all settings” (NIH, n.d.) and the international movement to investigate the Missing and Murdered Indigenous Peoples crisis in north America. Research examining AI/AN-specific violent deaths has been mainly focused on endemic rates of suicide among the population. With increased data accessibility, research has turned to addressing homicide but undetermined and legal intervention deaths, along with the distinct social and ecological determinants of health variance by cultural regionality remain ill-understood and under-researched. The Center for Disease Control and Prevention’s (CDC) National Violent Deaths Reporting System (NVDRS) is a state-based national surveillance system that collects data on the characteristics and circumstances surrounding violence-related deaths. Data from participating states on homicide, LI, and UD deaths among AI/ANs was linked to U.S. Environmental Protection Agency (USEPA) Tribal zip code tabulation areas identified as overlapping reservation lands (RL), and U.S. Census Bureau decennial population statistics to address the following aims:

Aim 1

- **Specific Aim 1:** Determine 2020 mortality rates for American Indian/Alaska Natives by manner of death (homicide, undetermined[UD], and legal intervention [LI]) and compare by place of death (nation, state, region, reservation lands) and to non-Hispanic whites.
 - Hypothesis 1a: There will be regional differences in mortality rates for AI/ANs compared to NHWs.
 - Hypothesis 1b: Higher risk of violent death (homicide, undetermined, legal

intervention) will be associated with Alaska, Southwest, and Midwest states and IHS regions.

Aim 2

- **Specific Aim 2:** Describe individual and social (age, sex, education level, homelessness, migration), incident (incident type and weapon type), and system (homelessness, autopsy, toxicology, law enforcement narrative completion) characteristics for AI/AN violent death (homicide, undetermined, legal intervention) decedents from 2005-2020 and identify any associations with completion of system-level variables (autopsy, toxicology, and law enforcement narrative) by place of death (RL or NTL) compared to NHWs.
 - Hypothesis 1: Observations of homicide and legal intervention will be higher on RL while Undetermined (UD) observations will be higher on NTL.
 - Hypothesis 2: AI/AN observations reported on RL will be associated with lower autopsy, toxicology, and law enforcement narrative completion compared to NTL AI/AN and RL and NTL NHWs.
 - *Exploratory Aim 2a:* Determine the percentage of data entries for each independent variable recorded as “Unknown” or “NA” for AI/AN and NHW violent death decedents and compare them by place of death, and against the NHW comparison groups.
 - *Hypothesis 2a:* I anticipate a higher percentages of Unknown and NA entries for AI/AN across manners of death, place of death, and compared to the NHW comparison group.

Dissertation Structure

This dissertation is composed of two papers examining characteristics and rates of NVDRS-recorded homicides, undetermined, and legal intervention among the AI/AN population. Specific aims 1 and 2 are presented consecutively in chapters 2 & 3 in the following structure. Chapter 2 presents a literature review providing a brief introduction to violence against AI/AN, its residual historical grief resulting from colonization in contemporary Indian Country, and efforts, community and research-driven, to better understand and develop prevention strategies for violence among AI/AN communities. I will outline the methodology used, including a description of each data set, dependent and independent variables, and statistical analyses for each aim in Chapter 3. In chapter 4, we provide all results pertaining to this study by aim. A discussion linking overall findings of dissertation aims will be provided and followed by limitations of this research, and recommendations for future research in Chapter 5. All tables and figures discussed in the text will appear at the end of the chapter in which it was referenced.

CHAPTER 2: LITERATURE REVIEW

In this chapter, I present a review of literature on three main areas of interest to contextualize violence in Indian Country. First, I provide a brief historical perspective of violence against indigenous AI/AN peoples and lands that contribute to modern trends of violence mortality and expand to wider implications to overall health and wellness in AI/AN communities. Select individual and social characteristics of contemporary Indian Country populations and distinct lands that define “place” in our study. Place is a key concept in AI/AN health and culture but due to the complex patchwork of modern Tribal lands, use for research purposes is delicate. We do our best to provide a rationale to qualify the application of our binary place variable in this section. This leads directly to the medicolegal investigative process, where incidents involving AI/AN persons and lands are treated differently than any other racial/ethnic group because of their sovereign status. Select recent literature reporting on violent deaths among AI/ANs and utilization of NVDRS data is discussed. Lastly, I will offer a theoretical perspective on modern interpersonal violence among AI/AN nations in the U.S., inclusive of previous historical context, which guided this study.

A Brief History of Violence in Indian Country

While a full history of violence inflicted upon Tribal peoples of the U.S. is not possible to document here, I will highlight in the following sections the violent tactics and policies experienced by the majority of indigenous populations of the U.S. This history specifically pertains to my research on homicide and deaths of undetermined intent by introducing the timeline of violence experienced by the AI/AN at the hands of the United States and its government and institutions that defined the socio-geographic landscape of Indian Country today.

Colonization and Historical Trauma

Breaking down cultural norms and social connectedness is the central premise of colonization, where exploitation and subjugating lands and their peoples (Kohn and Reddy, 2017) are not only acceptable, but necessary means. This centralized premise normalized violence as a resource to be used against anyone determined to be “other” than the desired European settler. When indigenous peoples challenged this concept, retaliation took increasingly violent roles within the American system. From a socioecological perspective, patterns of violence toward Tribes and their people were designed and enforced at all levels. Prior to forced colonization, the population estimates from indigenous peoples in North America ranged from 1.5 – 20 million. Following periods of colonization, indigenous population estimates were below 250,000 by 1910 (Azria et al., 2020). During this time the colonial period (1492-1828) consisted of nation-to-nation relations between colonial governments and Tribal nations (Azria et al., 2020). What is known as the “Removal, Reservation, and Treaty” period (1828-1887) saw an increase in military violence as colonial forces pushed farther west but also produced Treaties affording (signing) Tribal entities sovereignty under the protection of the United States (Azria et al., 2020). Those Tribal individuals who signed a treaty with the U.S. government represented an unknown number of Tribal nations and bands (small groups living separately but interacting socially). It is important to note that the individuals who did not sign a treaty with the U.S. government equally represent an unknown number of Tribal nations and bands. These peoples were not considered a recognized Tribe under the U.S. Constitution, were not afforded the same sovereign status or lands, and essentially groups erased to assimilate into national aggregate data. It is also vital to acknowledge that the agreements made in treaties have been consistently

violated, causing further harm to generations AI/AN whose federal sovereign status remains intact.

Extending original colonial aims to acquire Indian lands, policy began to erode Indian Country through the General Allotment Act (Dawes Act, 1887) by allotting small parcels of larger Indian lands to individual natives, determining all other lands “free” for white settlers. More than 90 million acres were taken from Tribal nations through this policy, a theft of two-thirds of the land previously “reserved” by treaty. In tandem with division of Tribal lands, equal destruction to the Indian family ensued through the Civilization Fund Act (1819) wherein indigenous societies were targeted for the “civilization process” through American education system (Mejia, n.d.). Passing this act led to the creation of Native American Boarding Schools, a network of approximately 408 federal boarding schools across 37 states including 21 in Alaska, and 7 in Hawaii (DOI, 2022), where Indian children’s attendance was mandated without consideration of family consent (Mejia, n.d.). These boarding schools enforced the violent removal of children, abuse, up to and including death at schools, and genocidal practices enforced by governmental and religious school administrators.

The recent Department of Interior Investigative Report (2022) on federal boarding schools identified 53 schools across the system with unmarked burial sites. Canadian boarding school investigations have also uncovered remains of people, mostly children, who died at the schools (Austen, 2022). Ian Austen also reported for the New York Times (2022) that a single school in Saskatchewan was responsible for the remains of 751 individuals. The Marieval Indian Residential School where these remains were found operated from 1899-1997, operated for most of its history by the Roman Catholic Church for the government of Canada (Austen, 2022). Despite the tragedy this presented through the violent removal of children, abuse and death at

schools, and genocidal practices enforced by governmental and religious school administrators, there remain active Indian boarding schools today. This tragic history serves as a root cause (among many I discuss here) for generational trauma and the legacy of mistrust toward government, religious entities, and the act of leaving Tribal lands on any grounds. The allotment period ended with the Indian Reorganization Act (Act of June 18, 1934) which was a brief effort to return some dignity (albeit short lived) to Tribal nations (1934-1945).

The Persistent “Indian Problem”

The era from 1945-1968 and revised Indian policy introduced the permanent chasm in the AI/AN population in the U.S. that we see today. Termination policies reversed federal recognition of more than 100 Tribal nations which qualified their lands again as “free” for the taking. This era also ushered in policy to lure Natives from their protected Tribally designated lands. The 1950s urban relocation efforts coerced AI/AN peoples into leaving Tribal lands (and reservations) to sites in Los Angeles, San Francisco, San Jose, Oakland, Chicago, Detroit, Cleveland, Dallas, and Denver (Finkelman, P. & Garrison, T. A., 2009). Layering and ratcheting up the target of social disorganization (labeled as assimilation) among AI/AN, the Adoption Act of 1958 allowed governmental officials to remove Native children from their families to be adopted by white families. It is estimated that 25%-35% of Indian children were removed from their Native homes between 1969-1974 (House of Representatives, 1978). Equally as traumatic for Native women, the Indian Health Service forced sterilization of over 3,400 AI/AN women between 1973-1976, preventing childbearing and violating the basic human rights of AI/AN women. A 1977 United Nations reports an estimated 24% of Native women had been sterilized as a result (Native American Solidarity Committee, 1977).

The inordinate brutality on AI/AN children and families continues today as evidenced by the 2022 investigative report for the Federal Indian Boarding School Initiative (Newland, 2022) and the case currently under review by the U.S. Supreme Court, *Haaland v. Brackeen* (2023). The Federal Indian Boarding School Initiative report indicated limits in funding and Federal facilities closures prevented the full examination of issues associated with the investigation into targeting of Indian and Native Hawaiian children associated with territorial dispossession (Newland, 2022). Findings of this initial report conclude there were 408 schools operated by the United States between 1819 and 1969, including 7 in Hawaii, with at least 53 burial sites for children across the system (Newland, 2022). The author notes that more burial sites are expected as the research continues and concern for the scale of lasting consequences harboring in AI/AN Tribal, Alaska Native, and Native Hawaiian communities (Newland, 2022). The Department described a secondary level of targeting of American Indian, Alaska Native, and Native Hawaiian removal through over 1,000 other Federal and non-Federal institutions like Indian day schools, sanitariums, asylums, orphanages, and stand-alone dormitories (Newland, 2022).

Release of the U.S. Department of the Interior report occurred in tandem with a formal attack on the Indian Child Welfare Act (ICWA) (U.S. Congress, 1988). ICWA is the Federal law protecting the best interest of Indian children and families by affirming rights of Tribal nations over their citizens. The law set minimum Federal standards for removal Indian children and prioritized placement of Indian children. The preferences go: first with an extended family member; second to a foster home licensed by the child's Tribal nation; third to any Native foster home approved by the state; and fourth to an institution for children approved by the nation (25 CFR 23). At the present time, the U.S. Supreme Court is set to rule this current month (June 2023) on a case challenging the law's constitutionality based on a white family's argument that

ICWA disfavors non-Indian (white) families in child-placement. The pro-bono legal team for Chad Everet Brackeen, the plaintiff in this case, is Gibson Dunn. The firm who represented Energy Transfer, the company behind the Dakota Access Pipeline heavily protested by indigenous peoples at Standing Rock (Habbart, 2022). Gibson Dunn has represented interests against Tribal nations before, including cases against Tribal gaming, disestablishing the Mashpee Tribe's reservation in 2020, and other Big Oil companies like Chevron and Shell (Habbart, 2022). The case is an insidious invasion on the Native family, Tribes' political status and self-determination as sovereigns. *Haaland v. Brackeen (2023)* is the most recent attempt to steal the future of Native nations by child-removal and cultural disassociation for profit.

The thorough attack on every level of existence for the Indian community remains woven into the fabric of the United States. Present day, Indian country is a dichotomy based on socio-geographic place for those Tribal nations who persevered with their Tribally designated lands (reservations etc.) and sovereignty in place and those Natives living off Tribal lands. The "Non-Tribal Lands" (NTL) mix includes legacies of urban relocation who remain in urban centers and many individuals and families who leave the reservation to pursue a variety of opportunities not available on reservations, often located in rural areas. Both groups share a common history, wherein two distinct social settings are the product of an American system's constant reminder of the desire to eliminate indigenous perspectives, histories, lands, bodies, and collective futures. Equally understood across these groups are the experiences where colonial movements and their beneficiaries routinely deny responsibility for the associated social and environmental traumas resulting from the movement (Sheehan, et. al., 2010).

A Legacy of Institutionalized Racism, Health, and Violence

The American health care system spends almost twice as much as other high-income countries in GDP dollars (Tikkanen and Abrams, 2020), yet the health of its people has not advanced correspondingly. In terms of life expectancy, the US ranked eleventh out of eleven high-income countries in a cross-national Commonwealth Fund analysis and first in suicide (Tikkanen and Abrams, 2020). This reflects a deeper structure that facilitates inequality in health within the American population. For many, this differentiation is based on racial classification. The oppression of AI/AN populations based on race laid the American framework of institutionalized racism, or the social allocation of privilege based on race (Hardeman, Murphy, Karbeah, & Kozhimannil, 2018).

Institutionalized racism plays a central role in how and whether AI/AN peoples (among other non-white Americans) are counted and in what location. If the concept of race is a social determination, the Census is a tool for employing it through a lens of racism. The decennial count is vital to federal funding that establishes 1) the AI/AN populations existence and size (service population); 2) whether they live on or off Tribally designated lands (i.e., reservations); and most recently 3) what Tribal nation they are affiliated with. This process also exposes internal racism when individuals are confronted with determining whether their AI/AN group “qualifies” as federally recognized Tribal nation or has been “terminated” from federal-recognition or has state recognition. Navigating the race reporting process for many AI/AN is a trauma in itself when having to make determinations about one’s existence using a white racial framing. In the absence of that influence, there would be zero terminated Tribal nations and AI/AN demographic units would be larger.

In 2017, final death data from the National Vital Statistics Report showed ethnicity of AI/AN

deaths at 0.4 percent of all Hispanic deaths and 86.8 percent for NHWs (Kochanek, Murphy, Xu, & Arias, 2019). Due to population sizes, the NHW population accounts for a much larger portion of the population of Hispanics in the U.S. and should be separated. Therefore, the non-Hispanic White (NHW) decedents are an appropriate comparison group for Hispanic/non-Hispanic AI/AN group. Inclusion of Hispanic ethnicity most accurately represent the population according to the definition specifying those original North American people who maintain cultural identification. All other race classifications will be excluded.

A Note on Federal Recognition and AI/AN Ancestry

Apart from being seen socially as AI/AN, the group is the only “race” category attached to a political designation as a federally-recognized by the United States government. The Code of Federal Regulations (25 CFR Part 83), Procedures for Federal Acknowledgment of Indian Tribes gives the U.S. Department of the Interior the authority to determine whether a Tribal nation exists or may also deny acknowledgement and recognition status. Tribal nations who meet the Federal “acknowledgement” criteria have a government-to-government relationship with the United States as sovereign nations with associated reservation (and other trust) lands (RL). This designation also extends eligibility for certain services to members of federally-recognized Tribal citizens through departments such as the Indian Health Service. Tribes with Federal Recognition are required to maintain a Tribal census whereby each individual born to that Tribe is recorded and blood quantum verified. Over the course of history, Tribes have been denied “acknowledgement” and had their status “terminated”, resulting in a gross underrepresentation of AI/AN ancestry within the U.S. populous. The history and continued existence of the Federal Recognition acknowledgement process for AI/AN communities is a tool of systemic racism in the U.S., its scars fueling wide gaps in research and understanding.

Ways in which this affects health outcomes among AI/AN communities are far-reaching. The variation in classification of race and ethnicity, especially for AI/AN, across the United States could prevent accurate quantification of health status (Ponce et al., 2019), essentially masking the magnitude of serious health issues. From a social-ecological perspective, inaccuracy in demographic methodologies prevents meaningful policy formation, funding, and intervention. National health surveys like the NVDRS were found to have significant differences across AI/AN groups and the population as a whole (Ponce et al., 2019). A U.S. Department of Health and Human Services report on national health surveillance instruments found issues in the weighting process where the Latino/a population (Hispanic or non-Hispanic ethnicity) was considered a single homogenous group at all (Ponce et al., 2019).

AI/AN demography research shows each census for decades has seen substantially higher population growth in the AI/AN population than expected (Liebler, Bhaskar, and Porter, 2016). The traditional balancing equation using births and immigrants could not account for the increases in AI/AN population size, so growth was attributed to changing of racial identification responses (Liebler, Bhaskar, and Porter, 2016). Indigenous connections to traditional or legal homelands (Liebler, 2010a), a strong American Indian identity and group connection among those who consistently reported AI/AN between 2000-2010 suggested “stayers” in the study might more frequently “report Tribal affiliation, live in an American Indian area, and report American Indian ancestry (Liebler, Bhaskar, and Porter, 2016). “Leavers” in the study were attributed to mixed-races options and directly changing race options between 2000-2010. For example, 173,000 people who were reported as single-race white in 2000 joined the single-race American Indian category in 2010 (Liebler, Bhaskar, and Porter, 2016). Factors in changing responses included a level of internalized racism where authors reported discrimination

experiences, residential mobility and associated differences in racial composition and their culturally relevant meanings as possible reasons for instability in AI/AN race responses (Liebler, Bhaskar, and Porter, 2016). This, the author stated, supported prior research connecting homelands with indigenous identity (Eschbach 1995; Kana'iaupuni and Liebler 2005; Liebler 2010b; Memmott and Long 2002).

Indian Country Today

Census respondents had their first opportunity to self-identify their race in 1960, and an estimated 52% net increase in the number of American Indians was observed (Passel, 1976, Thornton 1987). The demographic continues to grow to include substantially more than expected by demographers (Liebler, Bhaskar, and Porter, 2016). By the time of the 2000 Census, the total AI/AN population increased between 26% and 110% based on newly created AI/AN and other races categories (U.S. Census Bureau, 2002). This growing population is now split through the historic Indian reservation/lands systems to Reservation Lands (RL) and other rural and urban areas that are Non-Tribal Lands (NTL).

Reservations that exist today are diminished boundaries of the original agreed upon landscapes where continuous encroachment has had an adverse impact on social and economic stability. Tribal organizations themselves are forced to maintain their self-governance with inadequate funds, a workforce with low educational and professional capacity, and a web of residual trauma. In response to these stark conditions, reservation residents are drawn to urban environments to seek opportunities such as education, employment, or housing (Philip, 1985; (Jacobs-Wingo et al., 2016).

This pattern was evident in the 2010 decennial census where 71% of all AI/AN reported living in urban areas (Census, 2010). Urban AI/AN populations retreating from reservation lands

can find themselves sparsely connected by social networks and community resources specific to their cultural heritage in the larger populous. The network of agencies and organizations serving AI/AN populations and policies which value Tribal histories, current affairs, or best practices are few or are underutilized. In terms of the focus of this proposal, deep knowledge of professional duties related to an incident involving an AI/AN decedent and/or Tribal lands such as jurisdiction and AI/AN-specific racial identification is vital. Inaccuracy in reporting fuels a cycle of misrepresentation of the disparities in AI/AN lives lost to violent homicide and UD. AI/ANs living in both places find themselves at risk of systemic racism. But for the large population living in urban areas, the level of interaction with AI/AN peoples and lands by adjacent towns and communities in many rural locations is not afforded, resulting in less awareness outside reservation lands (Frost, Taylor, & Fries, 1992; Stehr-Green, Bettles, & Robertson, 2002). Whether a reservation or NTL resident, there is no area under the Tribal umbrella (recognized or not) that is untouched by the heavy burden of death by violent homicide and UD. The level of first-hand exposure to violence, post-traumatic stress, and generational grief caused by the original impact of colonialism and following waves of violence toward the AI/AN way of life serve as potent social determinants of present-day health outcomes and the cycle of violent behavior.

Racism is a crucial determinant of health for non-dominant racial populations in Americans who often experience adverse health effects as a result (Williams & Mohammed, 2013). Race itself as a social construct is not harbored only in the highest halls of power such as the US and state governments, rather it's fundamental power is widely dispersed throughout our American systems, and occurring at the institutional, interpersonal, and internal levels (Jones, 2000).

Racism, discrimination, and the “stigma of inferiority” (Williams, 1999) has contributed to disadvantaging AI/AN families by restricting access to housing, employment, social resources, neighborhood and educational quality (Williams & Mohammed, 2013). Studies show AI/AN are over-represented among homeless populations (Kasprow, 1998, Cole, 2020). A study on health risk factors among AI/ANs in Oklahoma showed the AI/AN sample (n=109) were more likely to experience discrimination and more likely to sleep on the street versus shelters (Cole, Hebert, Reitzel, Carroll, & Businelle, 2020). Another study looked at the homeless veteran population through the Veterans Affairs’ Health Care for Homeless Veterans program in 71 cities and found that AI/AN were overrepresented by 19 percent compared to all other races (Kasprow & Rosenheck, 1998).

Age – Indian Country is Young

The National Congress of American Indians (Azria et al., 2020) publishes detailed population statistics for Indian Country. The highest numbers of AI/ANs are reported in Alaska (27.9%), Oklahoma (17.4%), New Mexico (14.5%), South Dakota (12%), and Montana (9.2%). According to the National Congress of American Indians (NCAI) reporting on Tribal Nations (Azria et al., 2020) Indian Country is considered a young population with a median age of native people on reservations in 2010 estimated at 29 years, compared to 38 years for the total U.S. population. Due to the lack of distinction between RL and NTL AI/ANs, demographics specific to the NTL portion of the population (an estimated 60% of all AI/AN) are unknown. Even higher proportions of younger native people are reported across states and regions like South Dakota, where nearly 41% were reportedly under the age of 18 years compared to 29% of all Native people across the U.S. (Azria et al.).

Sex, Gender, and Violent Deaths

The U.S. statistical methods for reporting on demographics has historically constructed race categories that reflect a male understanding (Firestone, 1972; Ortner, 1974, Pateman, 1991) furthering a skewed concept of America toward male dominance. This outside patriarchal perception enforces a false reality of America and Indian Country where 51% of the population are female (NCAI, n.d.). With the understanding that rates reported are likely an undercount for various reasons, the statistics around female victimization by violence are clearly a cause for alarm. AI/AN women make up approximately 0.5% of the U.S. population according to the Census Bureau (2017); however, they make up nearly 2.5% of female homicide victims nationwide (Petrosky et al. 2017). The UIHI reported in 2016 that homicide was the third leading cause of death for AI/AN women (UIHI, 2016). Male AI/ANs suffer disproportionate rates of homicide from female AI/ANs (12.0 versus 3.9 per 100,000) (Petrosky, et al., 2021). A particular area of concern is legal intervention-specific homicide where in 2017 the National Vital Statistics Final Death report showed the AI/AN legal intervention rate was 0.8 compared to non-Hispanic whites at 0.2 per 100,000 (Kochanek et al., 2019). The demonstrable range of disparities among the AI/AN population justifies inclusion of both sexes in our sample.

Educational Achievement

The American educational system has lagged in adequately recognizing and addressing the violent nature of its relationship with AI/AN communities. Noticeably absent in tailoring educational curriculum for AI/AN students is multilevel progress toward returning portions of the educational journey back to traditional teachings. The dichotomous nature of our research design accounts for the differences in educational and social environments for learning and the potential for alternate versions of educational achievement between RL and NTL decedents that

do not currently exist in a western educational vocabulary. For example, 25 percent of AI/AN children in grades 4 and 8 used traditional language within the family at least half of the time (DeVoe and Darling-Churchill, 2008).

The educational and social environment is markedly different from other racial/ethnic groups in the U.S. The National Center for Education Statistics (2008) reported AI/AN students accounted for a mere 1.2% of public-school enrollment with 46% of those in rural (or remote) areas, the highest of all racial/ethnic groups (DeVoe and Darling-Churchill, 2008). A survey of 8th grade students in 2015 (U.S. Department of Education, 2017) determined the AI/AN population had the lowest rate of reported zero-absences from school. AI/AN students also face the highest rate of dropout of all racial/ethnic groups at 15% with 75% reporting receiving a high school diploma in 2006 (DeVoe and Darling-Churchill, 2008). DeVoe and Darling-Churchill (2008) report 20% of AI/AN aged 25 and older had not finished high school and associated unemployment for those 16 and older was 12%.

Crime, and the Legal Response in Indian Country

AI/AN populations remain understudied (Andreescu and Overstreet, 2020) in America. Acknowledging the differences between the 574 federally-recognized Tribes in the U.S. is a difficult task when the history has been systematically removed from the collective experience of being American. This hidden population suffers more when accuracy of data collection is based on procedure of law enforcement, first responders, and other professionals who have little contextual understanding or training to deal in a culturally competent framework with AI/AN deaths. Systemic errors in racial determination of AI/ANs result in higher numbers attributed to the White population and further oppress the AI/AN experience. For example, Washington state

linked death certificates with the Tribal Registry and identified 414 of 2,819 (14.7%) of AI/AN decedents as misclassified as another race (Stehr-Green, Bettles (2016)).

Through the Northwest Portland Area Indian Health Board's Tribal Epidemiology Center Pacific Northwest Tribes are taking action to address misclassification of AI/AN deaths. As a Tribal advisory organization, the Northwest Portland Area Indian Health Board serves the 43 Tribal nations of Oregon, Washington, and Idaho. Their strategic plan includes a surveillance and research area among others to enhance Indian health. Their project Improving Data & Enhancing Access – Northwest (IDEA-NW) works to directly reduce misclassification through record linkages. IDEA-NW identified 236 (9.95% of all AI/AN deaths) misclassified between 2014-2017 with the majority (n=225, 95%) incorrectly coded as White, followed by Black (n=5, 2.1%), Native Hawaiian/Other Pacific Islander (n=1, 0.4%), Other (n=2, 0.8%), and Unknown (n=3, 1.3%) (Joshi and Lan, 2018). Through examples from two states, Oregon and Washington, a concerning picture is presented where 10 to nearly 15% of all AI/AN deaths are attributed to an incorrect race category and most frequently that category is white (Stehr-Green, Bettles (2016), Joshi and Lan, 2018).

AI/AN Death Investigations

When a violent death incident involves an AI/AN decedent, suspect, or occurs on Tribal lands, the jurisdictional matrix is triggered. The long-standing government-to-government relationship between Tribal nations and the federal government is where many Tribal nations believe the incident response should remain to preserve sovereignty and self-determination. However, specific legislation has been passed to diminish the trust responsibility of the federal government set forth in treaties with sovereign Tribal nations. Public Law 280 was passed by Congress in 1953, granting certain states criminal jurisdiction over Indians on reservation lands

(RL) whereby the federal government gave up all special criminal jurisdiction over Indian offenders and victims without the consent or meaningful consultation with Tribal nations (18 U.S.C. § 1162, 1953). This move drastically altered criminal jurisdiction for the AI/AN populations by giving states greater reach onto Tribal lands, by creating a more confusing process for determining what incident details trigger which overlapping jurisdiction, and rationale for denying PL 280 Tribes funding for law enforcement (NIJ, 2008). Relieving federal responsibility to states gives the perception of a localized law enforcement when in fact it created a no-man's land where criminal incidents (violent death in our case) go unchecked, unsolved, and claiming countless lives.

Mandatory Public Law 280 states were: 1) Alaska (except the Metlakatla Indian Community on the Annette Island Reserve, which maintains criminal jurisdiction); 2) California; 3) Minnesota (except the Red Lake Reservation); 4) Nebraska; 5) Oregon (except the Warm Springs Reservation); and 6) Wisconsin (Administration for Native Americans, n.d.). A secondary set of states elected to assume full or partial jurisdiction under optional Public Law 280 status, these states include: 1) Arizona (1967); 2) Florida (1961); 3) Idaho (1963, subject to tribal consent); 4) Iowa (1967); 5) Montana (1963); 6) Nevada (1955); 7) North Dakota (1963, subject to tribal consent); 8) South Dakota (1957-1961); 9) Utah (1971); and 10) Washington (1957-1963) (Administration for Native Americans, n.d.).

A legal brief (Robbins, 2012) states “most Tribal Nations prefer working with the federal government and the state as a last resort”. Concurrent jurisdiction presents other issues, for example, if both Tribal and federal or state governments want to prosecute there is no double jeopardy issues because Tribes are separate sovereign nations. However, punishment by Tribal courts is limited to one year in jail, “even for a homicide”(Robbins, 2012). An Oregon judge,

Mr. William Johnson, for the Confederated Tribes of the Umatilla Indian Reservation points to other problems with concurrent jurisdiction including that it prevents timely action on crimes within dual-jurisdiction (Robbens, 2012). Judge Johnson adds the logistical considerations of simultaneous court proceedings like simple availability of witnesses and wait times for the U.S. Attorney's office that can be six months to a year (Robbens, 2012). The brief indicates that even with concurrent jurisdiction, crime data show 65% of reservation cases are declined by federal prosecutors (Robbens, 2012). For reasons like these, Public Law 280 has faced opposition from Tribal nations since its inception. As a result, acts of Congress, court decisions, and state actions have retroceded jurisdiction back to the federal government over the years, but its effects remain an obstacle that must be considered, especially with regard to violent death investigation. A model of the jurisdictional navigation process involving Tribal members and lands is provided in Figure 1.

Postmortem Medicolegal Investigation

According to the CDC (2016), a medicolegal investigation is conducted by a state's coroner's or medical examiner's office and are described as a scientific inquiry into a death under a coroner's or medical examiner's legal jurisdiction to determine the circumstances under which someone died. Each state sets its own standards for what kinds of deaths require investigation and its own professional training and continuing education requirements for individuals carrying out these investigations. For example, only four states require coroners to be physicians and states with laws specific to training requirements for coroners' number in the mid-teens (CDC, 2016). These different standards can have a broad-reaching public health impact as variations in the collection and reporting of cause-of-death data that could hinder accurate mortality surveillance. (CDC, 2016) as in the NVDRS.

Autopsies ordered by the state in the occurrence of a suspicious or unexpected death or when there is not enough information or a doctor who knows the decedent well enough to state a cause of death to sign the death certificate can be done by county coroners or medical examiners (Johns Hopkins Medicine, 2022). Coroner qualifications vary by state and county and can be done by a person who may not be a doctor while medical examiners are medically trained and usually a certified pathologist (Johns Hopkins Medicine, 2022). Procedurally, the autopsy consists of 1) a visual exam of the entire body (including the organs and internal structures); 2) microscopic, chemical (toxicological), and microbiological exams of the organs, fluids, and tissues; 3) removal of organs for weighing and preserving samples for microscopic slides; 4) a final report after all lab tests are complete (Johns Hopkins Medicine, 2022). These final reports contain the information entered into the NVDRS software by state data abstractors.

Violent deaths are the most severe outcome of interpersonal violence (Shen, 2013) stemming from a complex mix of overlapping forces contributing to circumstances and motivations (UNDOC, 2019). The nature of violence research is sensitive in many ways. This sensitivity surrounding violent homicide and UD deaths also contributes to the lack of research attention. The label of “special population”, used to describe the IHS eligible service population by the US healthcare system also hinders the research process by stigmatization. Classifying AI/AN in this way can lead to misunderstandings about the health and behavioral factors, misconceptions about the level of care (and funding) provided to AI/AN communities through the government, and both systemic and interpersonal prejudice based on those perceptions. Conducting research then, on a sensitive topic among a special population, may appear too risky for researchers without first-hand knowledge and experience with Tribal health.

Sensitivity and jurisdiction feed into initiation of a violent death investigation. A study in the Aberdeen IHS Service area of North and South Dakota in 1999 (Randall and Randall) on infant mortality identified a significant gap in death scene investigations. With a single exception, participating Tribal nations had no death investigator or a legal mandate to provide death investigation (Randall and Randall, 1999). The findings in this study led to 6 of the 19 Tribal nations drafting coroner legislation and holding death investigation training programs. The breadth of unmet death investigation components in Indian Country is unknown, further exacerbating serious public health threats to AI/AN safety.

The persistent racial disparities in violence are linked through an institutional lens where instead of meaningful change, the oppressive system is upheld at all costs, in this case AI/AN lives. The roots of these disparities stem from the lack of minimum qualifications for medicolegal investigators, silos in legal responses due to jurisdictional conflicts, and lack of attention to identify biases for community servants holding positions involved with AI/AN death investigations.

Community Response to AI/AN Violence

The lack of reliable data on homicide, UD, and LI from the professional public health and medical field leaves Tribal organizations and individuals turning to citizen science methods of data analysis. The Urban Health Institute, a division of the Seattle Indian Health Board, published a report on Missing and Murdered Indigenous Women and Girls⁴ in 2018 as a response to the “data crisis” surrounding the MMIWG epidemic (UIHI, 2018). This research effort used legal methods of Freedom of Information Act (U.S.C. § 552) requests to law

⁴ (MMIWG [other term commonly used are MMIW “Missing and Murdered Indigenous Women; MMIP “Missing and Murdered Indigenous People”; and MMIWG2 “Missing and Murdered Indigenous Women, Girls, and Two-Spirit])

enforcement agencies to build a baseline assessment of the national Missing and Murdered issue; they did not receive all requested information but did manage to account for n=506 urban missing and murdered indigenous women and girls broke down by U.S. city (UIHI, 2018). The substantial gap in access and accuracy of data for AI/AN continues to grow with particularly acute disparities in “sensitive” research areas including violence. In many cases, AI/AN, along with other small populations like Asians and Pacific Islanders remain unreported and underreported. Some of this is due to small population sizes equating to even smaller numbers of violence, and some can be attributed to poor surveillance. For example, the newer NVDRS identified 92% of legal intervention deaths between 2005-2012, more than the Federal Bureau of Investigation’s Supplementary Homicide Reports (58%) and the National Vital Statistics System (48%) (Barber et al., 2016).

AI/AN organizations are addressing disparities in violent outcomes and data sovereignty in novel ways within their own communities. The Urban Health Institute (UHI) has a project to advocate and provide data to protect Native women and girls through their “Our Bodies, Our Stories” report on sexual violence and socioeconomic determinants for their Seattle community (UHI, 2022). Another grassroots example is the Sovereign Bodies Institute out of California who has published reports on MMIWG2 in California (George, Lucchesi, and Trillo, 2021), domestic violence responses during the COVID-19 pandemic (SBI & CUHI, n.d.), and a toolkit for community members, survivors, and families affected by their loved one going missing or being murdered (SBI, n.d.). The community response to violence in Indian Country has shouldered the responsibility of identifying, investigating, and processing losses from violence for hundreds of years with little to no help or national discussion on the topic. Research specific to the crisis of violent death among indigenous communities is provided in the next section.

Homicide and American Indians/Alaska Natives

A team of researchers from the Indian Health Service (IHS), Johns Hopkins University, and the THREAD Research Institute, a clinical research technology and consulting firm, reported estimates of homicide among AI/AN using linked birth certificates to IHS patient registrations (to address misclassification) from 1999-2009 (Herne et al., 2016). They chose to use a non-Hispanic white (NHW) comparison group and focused primarily on residents of IHS Contract Health Service Delivery Area (CHSDA) counties (Herne et al., 2016). Results of their investigation showed rates per 100,000 of homicide were four times higher among AI/AN (rate =12.1) than whites (rate =2.8) and rates varied by sex and region (Herne et al., 2016). The highest reported region was in the southwest (rate = 25.5, male and 6.9, female) and Alaska (17.7, male and 10.3, female) (Herne et al., 2016). Relative risk (RR) was calculated for all CHSDA areas against the white comparison group with the highest disparity identified by Herne et al. (2016) in males of the Northern Plains region (RR=9.8, [CI 8.5, 11.3]), the 25-44 year age group (RR=9.0 [CI 7.5, 10.7]), and those decedents 0-24 years (RR=7.4 [CI 6.1, 8.9]) (Herne et al., 2016).

The Centers for Disease Control and Prevention conducted the most recent analysis on NVDRS homicide data among AI/ANs (Petrosky, Mercer Kollar, Kerns, et al., 2021). Their sample included 2,226 AI/AN homicide decedents from 34 states and the District of Columbia during 2003–2018 (Petrosky, Mercer Kollar, Kerns, et al., 2021). They reported the age-adjusted AI/AN homicide rate was 8.0 per 100,000 population with most victims being male. The median age for their sample was 32 years (interquartile range: 23–44 years) with over half of all decedents (52.7%) being killed in metropolitan areas (Petrosky, Mercer Kollar, Kerns, et al., 2021). Firearms played a significant role in homicide for their sample in nearly half (48.4%) of

all homicides. Their analysis included a variable on place of death being the type of residence rather than a geographical environment. They found that more AI/AN females than males were killed in a house or apartment (61.8% versus 53.7%) or in their own home (47.7% versus 29.0%) (Petrosky, Mercer Kollar, Kerns, et al., 2021) suggesting a high level of intimacy in female death.

Legal Intervention (LI) and American Indians and Alaska Natives

Legal intervention (LI) deaths are on the rise in the U.S. An earlier study from 1979-1997 using the same CDC data described LI deaths as uncommon with patterns of decrease in the 1980s, followed by a stable period between 1988-1997 (Sikora, 2002). Findings of that study concluded that LI had occurred highest among the 20-34 age group and mostly among Black males and with a firearm (Sikora, 2002). At the time of this study, Asian Americans and Native Americans were classified as “other” and were not reported (Sikora, 2002). A study from 2015 using the Compressed Mortality File and CDC WONDER (Wide Ranging Online Data for Epidemiologic Research) system found that a net 45 percent rise in legal intervention deaths occurred between 1999-2013 (Drowos, 2015). The majority of LI decedents were men (96%) and between the age group of 14-44 years.

The NVDRS showed a high sensitivity to police homicides (legal intervention deaths) in a study comparing the system to Vital Statistics and Federal Bureau of Investigation Supplementary Homicide Reports (Barber et al., 2016). Results of the study in 16 states reported NVDRS had a positive predictive value for police homicides of 98% and a sensitivity of 90% (Barber et al., 2016). Comparatively, Vital Statistics and Supplementary Homicide Reports were 58% and 48% respectively (Barber et al., 2016) lending confidence in the NVDRS as the most

accurate surveillance system on legal intervention (death by police or other law enforcement) available at the time of this study.

Undetermined Intent (UD) and American Indians and Alaska Natives

There is a body of research on deaths of undetermined intent (UD) that suggests a portion of these deaths are misclassified suicides (Bjorkenstam et al., 2014). Several studies have looked at the characteristics of violent deaths of undetermined intent in different ways. One study analyzed circumstances of UD using the National Violent Death Reporting System (NVDRS) among children in Illinois where 192 cases of UD among children in one county were recorded from 2005-2010 (Wu et al., 2017). Their major findings were that the majority of these cases were younger than one year old (81%), male (62%), and non-Hispanic Black (66%) (Wu et al., 2017). The Illinois research team pointed to the issue of not having any public health surveillance system specific to collecting information on UD deaths as a barrier to effective intervention (Wu et al., 2017). Other research has focused on the weapon type, poison, in UD NVDRS deaths from 2005-2015 (n=29,567 aged 15+) (Choi et al., 2019; Choi et al., 2020). Significant findings from this body of work were that UD deaths were highest in Kentucky, Maryland, Michigan, Utah, and Rhode Island where the odds of UD classifications were 7-10 times higher than in other states (Choi et al., 2020). Broken down by race, Black populations from these five states had twice the odds of whites of being classified as UD than suicide (Choi et al., 2020). There were no current studies on UD specific to the AI/AN population at the time of this publication.

Studies Using NVDRS

Oregon Pilot Study of AI/AN Homicide and UD Using NVDRS

In 2019 a collaborative effort between the Northwest Portland Area Indian Health Board's (NPAIHB) Tribal Epidemiology Center and Improving Data & Enhancing Access

(IDEA-NW) program, and Oregon State University analyzed NVDRS data for the state of Oregon for the years 2003-2017. Data were race-corrected through IDEA-NW, a project that conducts record linkages to correct misclassified AI/AN records in state surveillance systems (Northwest Portland Area Indian Health Board, 2023) thus provide the most accurate violent death data for the AI/AN group of Oregon. The U.S. Environmental Protection Agency ArcGIS table of Zip Code Tabulation Area (ZCTA) lands overlapping Tribal lands were used to determine socio-geographic location as reservation lands (RL) or non-Tribal lands (NTL) for incidents of homicide and UD among AI/AN at the Oregon state-level.

Preliminary results of the forthcoming publication (Harrison et al., 2023) show that AI/AN decedents of homicide in Oregon were more likely to be killed on Tribal lands and UD deaths were higher on NTL. Oregon homicide decedents were mostly male (>80% on RL and NTL), and RL decedents reflected younger in age groups with lower educational achievement compared to those on NTL (Harrison, et. al., 2023). The majority of homicides involved a single victim, over 50% involved a firearm on both RL and NTL, and legal intervention-specific homicide was twice as high on RL than NTL (Harrison, et. al., 2022). Individual and social characteristics showed NTL homicide decedents were more likely to be identified as homeless (15%) and to have migrated from their birth state prior to death (54%) compared to RL homicide decedents (2% homeless and 19% migrated) (Harrison, et. al., 2023).

Undetermined intent (UD) deaths for the same period showed that 75% of UD deaths occurred on NTL where higher levels of female victims were recorded, and sociodemographic results aligned with homicide in that victims on RL in age and education (Harrison, et. al., 2023). The primary weapon type contributing to UD deaths was poisoning and UD victimization

reflected homicide decedents' migration from their birth state to the state of death at over 50% of decedents compared to RL decedents (9%) (Harrison, et. al., 2023).

Furthermore, I observed data for NTL that was more frequently recorded as “NA” or “Unknown” which could point to a larger systematic problem for documenting and understanding violent death among AI/AN groups. This preliminary work suggests that there are multiple levels of factors and conditions associated with homicide and UD incidents and differences could be associated with the individual AI/ANs multiple positions (socially and geographically) in different social environment where exposures to these factors and conditions widely vary. We expect the role of place of death (reservation vs. non-reservation) will relate differently in homicide and deaths of undetermined intent for the national AI/AN population. I have confidence that expanding the analysis to a more comprehensive dataset at the national level will add to the gap in literature on violence among AI/AN communities.

NVDRS AI/AN Suicide Study

A Morbidity and Mortality Weekly Report was published by Leavitt et al., (2018) used NVDRS data from 18 states for the years 2003-2020 to investigate suicides among American Indian/Alaska Natives. Non-Hispanic whites (white) were used as a comparison group to identify differences in suicide characteristics and circumstances between AI/AN and white decedents. Rural-Urban Commuting Area (RUCA) codes were used to classify geographic areas into metropolitan and nonmetropolitan categories for additional comparison. The research team found that suicide rates of AI/AN were more than 3.5 times higher than those reported for other racial/ethnic groups at 21.5 per 100,000 (Leavitt, et al., 2018). Suicide decedents were younger for AI/ANs with the age group 10-24 years accounting for 37.5% compared to 11.1% of whites (Leavitt, et al., 2018). AI/AN decedent also differed from whites by geographic area having 6.6

times the odds of living in a nonmetropolitan area (adjusted odds ratio [aOR] = 6.6; 95% confidence interval [CI] = 5.9–7.3), toxicology results where they had 2.1 times the odds of a positive alcohol toxicology result, and 2.4 times the odds of a suicide of a friend or family member affecting their death (Leavitt, et al., 2018). The methodology from this study is replicated in the present study and are outlined in the next chapter (3).

Theoretical Perspectives

The proposed study aims, and research hypotheses were informed by the literature review and by several theoretical perspectives. Socioeconomic stressors that relate to higher levels of community violence include increased levels of unemployment, poverty, and lack of access to services (Chen, Voisin, & Jacobson, 2016; McMahon et al., 2013; Voisin & Neilands, 2010). Perpetual poverty on reservations facilitates violence as a resource and promotes a cycle producing an increasingly violent general environment where individuals are more likely to encounter violent behavior. As one of the smallest American subpopulations, AI/AN communities can be insulated in tight-knit communities that have the potential to veil antecedents of violence. Violence truth-telling and associated stigma contributes to the lack of attention from institutions responsible for safety and health while inducing additional violence. The examination of geographic place highlights the role of networks connecting people. Public service organizations, opportunities for work, education, capital accumulation and property appreciation are defined by geographical networks within reach (Massey, 1996; Sampson and Groves, 1989; Wilson 1987; Logan and Messner, 1987; Yount and Li, 2010). Social capital and social organization are resources for communities to react individually or collectively to unacceptable behaviors; these mechanisms are weakened with economic deprivation (Sampson and Groves, 1989). Associations between deprived economic conditions and elevated levels of

community violence suggest community members adapt to conditions of endemic violence by also becoming violent (Massey, 1996; Anderson, 1994; Bourgois, 1995).

Based on the importance of the social structure and external political forces distinctly placed upon AI/AN society, the present study was guided with temporal respect by anomie theory (Durkheim, 1933; Merton et al., 1968), social learning theory (Bandura, 1978), Messner, 2010), strain theory (Agnew, 1992, 2001, 2006), and resource theory (Goode, 1971). Thus, I offer the notion that incidents of violent deaths converge on an intersection where the system was built (or deconstructed) to leave AI/AN communities powerless (Walter and Anderson, 2013).

Anomie and General Strain Theory

Anomie theory posits social disintegration leads to a state of disorder and marked by increased crime and deviance (Durkheim, 1933; Merton, 1968). There is a strong sense that federal Indian policy since the time of contact is aligned with anomie theory in its destructive effects on the indigenous American social structures. As outlined in chapter one, centuries of severing indigenous peoples from their traditional environments, culture, and family bonds meets this definition. The unexpected survival of AI/AN communities in these anomie conditions on what equates to permanent internment camps (federal Indian reservations) only fed increasingly violent policies and spread increased destruction by further eroding established social norms of family, community, and culture. Introduction to a western model for social structure created insurmountable obstacles due to cultural incongruency to meeting basic needs for AI/ANs (Peterson, Xu, Leemis, Stone, & Ballesteros, 2019) and preventing resourceful ways to handle conflict-based root causes (Lawson, 2012). Integrating General Strain Theory (GST [Agnew, 1992, 2001, 2006]) to my theoretical framework brings forth a present-tense perspective to

extend historical anomie in my target AI/AN population. GST states that a range of stressors and strains increase the likelihood of crime (Agnew, 1992). Strains and stressors relevant to this study are: 1) loss of positively valued stimuli (e.g., family members, land, culture); 2) inability to achieve positively valued goals (e.g., resources [financial, cultural], and agency); 3) presentation of aversive stimuli (e.g., abuse, death, racial oppression [Maltreatment]) (Agnew, 1992). These strains cause negative emotions (internal racism) for a population with few resources for positive coping which GST suggests leads to illegal coping methods. Illegal coping strategies may include running away, drug activity, sex work etc., which then increases risk for violent victimization through co-locating in places and situations conducive to violence (Agnew, 1992) and may contribute to my variables that capture homelessness and migration.

Resource Theory

Resource theory is an explanatory justification for physical force, or its threat being used as resource itself (Goode, 1971). Goode (1971) also proposed the idea that the greater resources a person can command, the more force they can muster. Therefore, with greater resources, the less likely a person is to use force in an overt manner (Goode, 1971:628). Violence then is thought to be used as a resource when other resources are insufficient or lacking (Gelles & Straus, 1979) and members see no nonviolent ways to overcome their disadvantaged positions (Blume, 1996). Further trends in violence including the inverse relationship between income and violence and the overrepresentation of women, minorities, and the poor in victimization. A research approach is needed that captures wide societal pressures paired with increased attention at the lower intra and interpersonal levels and inclusion of economic factors contributing to the family unit.

The family is considered a protected unit of privacy in terms of the legal position on home environments and operational relationships where family ‘systems’ focus internally on conflict and management. Straus described in his early works on General Systems Theory (1973) that the family is a reflexive loop in a goal-seeking adaptive system. Indigenous communities strive to retain or access traditional resources (homelands, burial grounds, sacred places) and exercise treaty rights pertaining to vital food-systems that plays an important role within the native family. Disassociation from these resources blocks the goal-seeking ability of men and women in native families.

Social Learning Theory

Children exposed to violence and associated disadvantaged conditions like substance abuse (Dore, Kauffman, Nelson-Zlupko, and Granfort, 2006) and malnutrition (Kleinman, Murphey, and Little, 1998) inside the home and wider community show higher levels of negative coping behaviors like aggression, anxiety, and posttraumatic stress disorder (Kenney & Singh, 2016). Connections between adversity experienced in AI/AN childhoods and comorbidities in adulthood (Kenney & Singh, 2016) expose the cumulative effect of lasting and unresolved trauma and the result when it goes unresolved. The importance of understanding the role of violence itself as a catalyst in transmitting violent behavior for AI/AN is of specific concern. AI/ANs experienced external violence dating back to wartimes post-contact, forceful removal, boarding schools, missionaries, and federal agencies. Research shows adults who commit violent acts are also more likely to come from abusive homes (Steele & Pollock, 1974) suggesting predisposal to pattern of violence increase likelihood of acting out learned violence. In the work of Bandura in the groundbreaking Bobo doll experiments in 1961 (Bandura, Ross, and Ross, 1978b) behavior is passed and modeled by individuals who experienced aggressive behavior as

close observers. They observed this transmission of aggression through experiments involving children of both sexes at an average age of four years (Bandura, Ross, & Ross, 1978b). Through witnessing adult “models” aggressive behavior toward a doll, children imitated the same aggressive behavior when given the chance with the doll (Bandura, Ross, and Ross, 1961). The model assumes the isolated AI/AN community where incidence of violence (especially lethal violence) is high results in increased opportunity to experience violence that ultimately feeds back into increasingly violent conditions.

Conceptual Framework

This research on comparisons of homicide and UD death rates among AI/AN relies on a conceptual model that links historical social antecedents, mediating structural and internal factors, and barriers to lethally violent settings and behavior. Figure 2 depicts this model to show Pre-colonial indigenous life in the Americas at the left and condensed eras of destructive (anomie) forces at a population level through colonization. The model then depicts the juncture where the indigenous population became a labeled race and was divided into two distinct places of populous (reservation lands and non-Tribal lands). At this level of the model, environmental and social strain for each of the two place-based groups in present-day society has a layering effect where the burden of grief is compounded intergenerationally while coping and treatment of said grief (e.g., PTSD, depression, substance abuse, etc.) remains inaccessible. The coping domain includes antecedents of individual level emotions stemming from the layers of strain and the exposure to maladaptive coping strategies.

The final domain in my model is where resources can serve as possible points of community and cultural intervention. Dependent upon the strength of the resources available to the person, or whether they are weak or lacking influences the outcome of violence and

victimization. Differentiation in strains and resource buffers exist between my place-based groups. For example, I would posit that socioeconomic conditions for RL would be lower than NTL but that they are in varying amounts neutralized by cultural buffers wherein a wide range of community assets are shared more freely in tight-knit RL communities. Conceptually, when those buffers are strong and in abundance, they would have a positive effect on moderating risk of violence and victimization. Lack thereof, contributes to the desperate experience in the coping domain. Therefore, a focus from the negative pathway intra-personally to enforce environmental and social protective buffers specific to the two place-based communities could hypothetically reduce lethal violence in AI/AN populations.

Theoretical Applications

The scope of one study cannot address all components included in my conceptual model so there are limitations to what can be included in our application of the theoretical concepts and domains. First, this research is primarily looking at rates of homicide and undetermined intent (UD)-specific violence among the American Indian and Alaska Native (AIAN) population as our health outcome. This study is novel because it will investigate place of death in relation to homicide and UD rates.

I accomplish this through the separation of decedents for each racial group (AI/AN and NHW) using Zip Code Tabulation Areas (ZCTAs) to classify geographic areas as Reservation Lands (RL) or non-Tribal lands (NTL). I analyzed variables at different levels of influence, the individual, incident, and systems-level. The individual level will include age, sex, educational achievement, homeless status, and migration status (differences in birth and death state). Incident level variables detail the number of decedents in each incident and use of any weapons. The

systems level captures death investigation variables including autopsy performance, toxicology screening, and reports and presence of a law enforcement narrative.

Figure 1. Indian Country Jurisdiction Flow Diagram Modeled from Robben (2012) Life in Indian Country: How the Knot of Criminal Jurisdiction is Strangling Community Safety

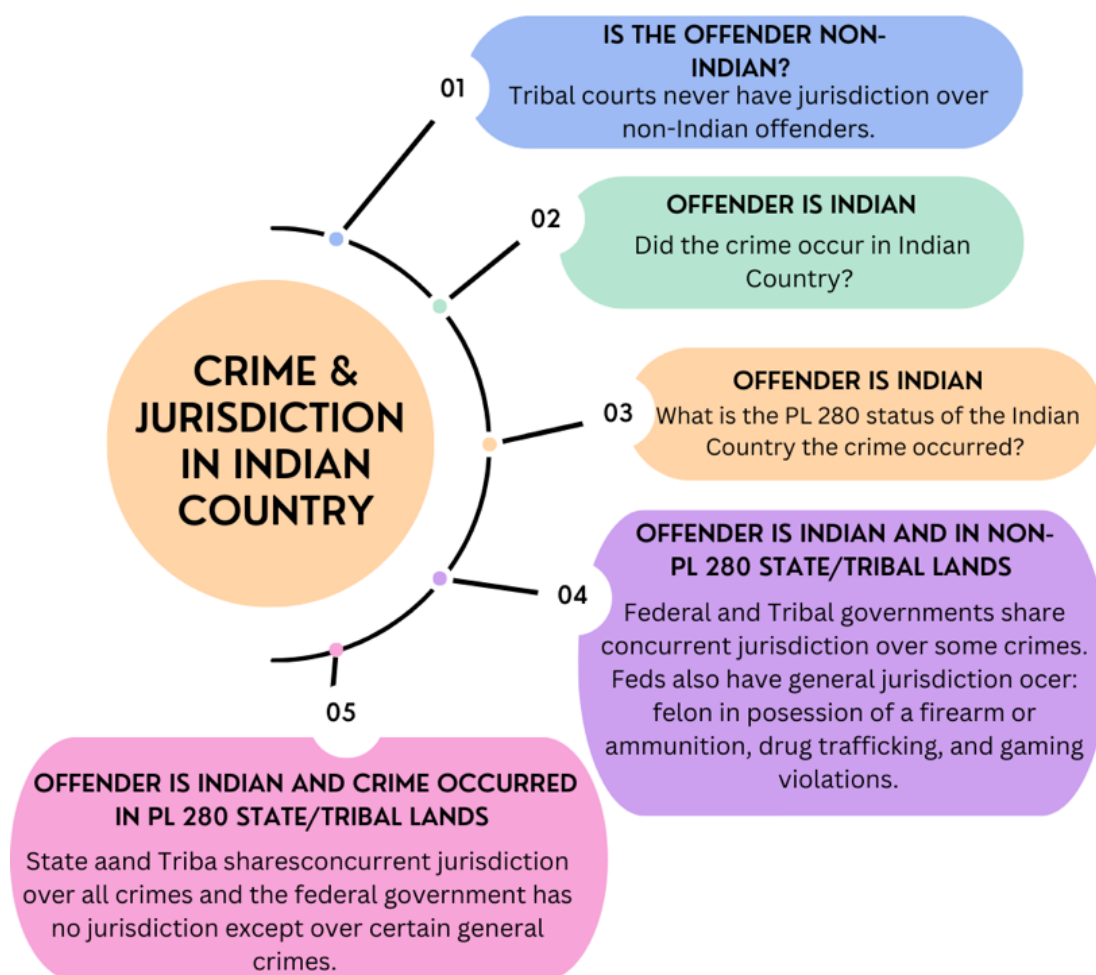
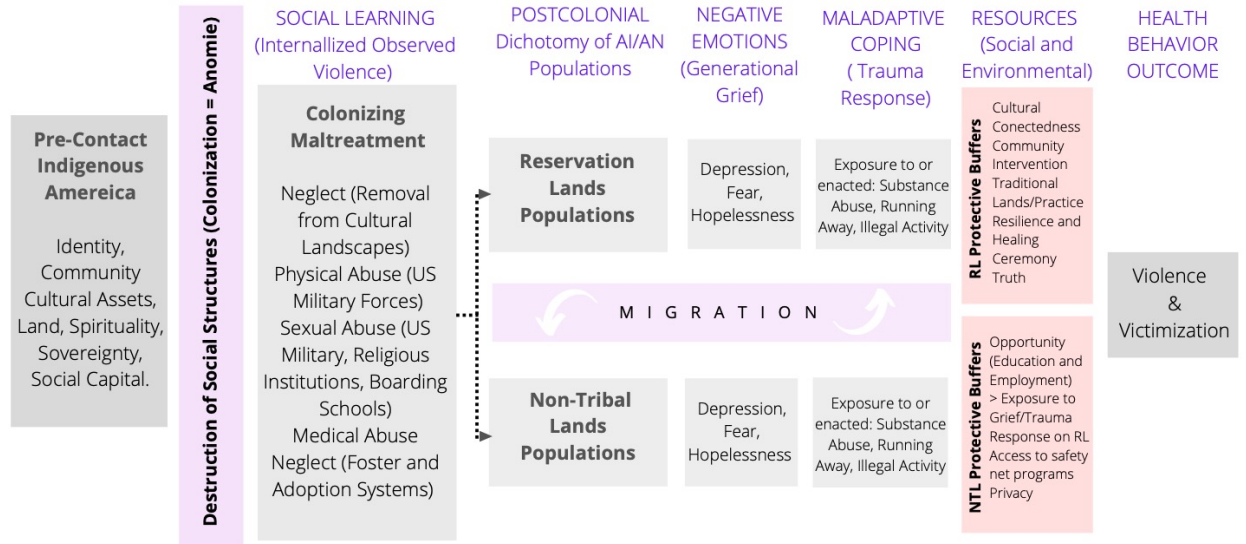


Figure 2. Conceptual Framework: Adaptation of Iratzotqui's Fully Estimated Model of Direct and Indirect Effects of Child Maltreatment (2018) from Robert Agnew's General Strain Theory (1991, 2001, 2006).



CHAPTER 3: METHODS

Study Design

We employed a cross-sectional study design using secondary data from the CDC's National Violent Death Reporting System's most recently available dataset (2003-2020). These data address study aims to describe cause-specific homicide, legal intervention (LI), and undetermined (UD) mortality in the AI/AN population versus non-Hispanic Whites in the United States by multiple geographic place designations. This chapter will provide a summary of the collaborative efforts undertaken for this study, a description of datasets utilized and linked, and a detailed discussion of each variable of interest outlined under each aim (1 and 2). Table 2 provides an outline of the datasets, sample, and variables of interest. The statistical analyses section under each aim describes the detailed steps and analytical software used for reporting results of each aim in chapter 4.

Preliminary Planning

Tribal sovereignty and AI/AN ancestry requirements like blood quantum and enrollment are concepts unique to indigenous Americans that require researchers to possess supplemental knowledge and guidance in research planning often unavailable through university curriculum. I worked directly with the Northwest Portland Area Indian Health Board, owners of the state-level AI/AN Oregon VDRS data which allowed for a collaborative effort on the design and aims developed and expanded in this project. Through this relationship, the discussion extended to the team at CDC involved in Operation Lady Justice (OLJ): The Presidential Task Force on Missing and Murdered American Indians and Alaska Natives. The Office of Tribal Affairs and Strategic Alliances and National Center for Injury Prevention and Control – Violence Prevention Division weighed in on the development of this study, including the addition of legal intervention-specific

homicide in aim 1. Their group authored the MMWR paper on homicides among AI/AN using NVDRS published in 2021 (Petrosky et al., 2021) and relayed information on rising numbers of LI death among AI/ANs specifically. This project is an extension of two previous studies on homicide in IHS regions (Herne, 2016) and NVDRS rates of suicide (Leavitt, et al., 2018) among AI/AN incorporating a community-based approach to research design and implementation.

Study Datasets

National Violent Death Reporting System (NVDRS)

The national surveillance system for violent deaths built upon previous systems like the National Violent Injury Statistics System (NVISS), a collaborative effort of twelve universities, health departments, and medical centers administered by the Harvard Injury Control Research Center (CDC, 2021). In 2000, federal funding was approved to extend NVISS-like surveillance nationwide in the US with the goals of collecting and analyzing “timely, high-quality data for monitoring the magnitude and characteristics of violent deaths at the national, state, and local levels (CDC, 2021). The system is funded and coordinated at the federal level with data collection dependent upon each state, district, or territory managed by the state health department or their agent (e.g., Office of the Chief Medical Examiner) (CDC, 2021).

NVDRS Data Access

In 2003, the first state health departments, Maryland, Massachusetts, New Jersey, Oregon, South Carolina, and Virginia, began collecting violent death data in the NVDRS (CDC, 2021). In 2019 all 50 states, the District of Columbia, and Puerto Rico had joined the NVDRS and began collecting data (See Figure 3.). NVDRS recommends data collected from 2003-2004 serve as a system implementation period and for that purpose, those years have been excluded from the aims of this study. All NVDRS data for years 2005-2020 meet inclusion criteria.

NVDRS policy is to suppress all cell counts of fewer than five deaths (zero may be shown) and rate calculations require a count of at least 20 deaths to be calculated.

NVDRS Definitions & Methodology

The NVDRS is unique in its linking of all victim and alleged perpetrator (suspect) records associated with an incident of violent deaths by temporal means in over 600 variables from a multitude of sources (CDC, 2021). The determination of death association is based on timing of the injury, also known as the 24-hour rule where deaths that result from injuries that occur within 24 hours of each other and are clearly linked by source documents are considered part of the same incident (CDC, 2021). The primary source documents for each incident record recorded in NVDRS are 1) Death certificates; 2) Coroner/Medical Examiner reports, including toxicology reports; and 3) Law enforcement reports (CDC, 2021). Other secondary (optional) sources include 1) Supplementary Homicide Reports and National Incident-Based Reporting System (NIBRS) reports; 2) Child Fatality Review team data; 3) Intimate partner violence (IPV) expanded data (e.g., from Domestic Violence or IPV homicide review panels); 4) Crime lab data; 5) Hospital data; 6) Other law enforcement data from official sources, such as court records or official law enforcement press releases (CDC, 2021). Data may be manually entered into the software by abstraction of records from primary sources or by transfer of data from the primary source to the VDRS program office NVDRS abstractor. The process is expected to have all available primary source documents pertaining to an occurrence of death entered into the system within sixteen months of the end of the calendar year the death occurred (CDC, 2021). The availability of primary source documents varies across states, counties, and regions with an expectation that missingness will range from 10-90% for some variables (CDC, 2021).

NVDRS Definition of a Violent Death

The system uses the World Health Organization (WHO) definition of violent death: “a death resulting from the intentional use of physical force or power against oneself, another person, or against a group or community” (WHO, n.d.). The violent death definition conceptually includes suicides, homicides, deaths from legal intervention (a subtype of homicide), and deaths of undetermined intent. Undetermined intent (UD) deaths are described as “deaths with some evidence of intent, but without enough to definitively classify the death as purposeful”, (CDC, 2021). These deaths also result from the use of force or power against oneself or another person; the difference in determination lies in the evidence indicating one manner of death is more compelling than another (i.e., accidental overdose vs. suicide) (CDC, 2021). Deaths excluded from the NVDRS system are 1) Legal executions; 2) Legal assisted suicide; and 3) Deaths due to acts of war (acts due to terrorism are the exception); and 4) Death of a fetus prior to birth that is caused by violence (CDC, 2021). All manners of death are assigned according to the International Statistical Classification of Disease and Related Health Problems, 10th Revision (ICD-10) code assigned by the coroner/medical examiner as the underlying cause of death (See Table 3). The present study will exclude all violent deaths against oneself or suicides, focusing on those resulting from interpersonal violence against another person.

All resident violent death collection is the goal of the NVDRS and essential for population-based analysis of its data (CDC, 2021). Therefore, all decedents who are a resident of the United States (including states, territories, and American Indian reservations) at the time of the initial injury and where said injury occurred in the US should be collected (CDC, 2021). The coding manual developed for NVDRS states, “usually the state of residence and state of occurrence of a fatal injury will be the same, but every state will have some exceptions”, (CDC,

2021), I will explore a level of this concept for the sample population through the migration variable where birth state and death state are compared. Each state is responsible for collecting information for violent death among their residents and residents of other states if the injury occurrence leading to death was within their boundaries (CDC, 2021). All state VDRS programs joining NVDRS are required to received coding training for new NVDRS abstractors and ongoing coding support through monthly conference calls and optional coding workgroup calls (NVDRS, 2018).

Key NVDRS Variables

The way that NVDRS data is coded by abstractors is vital to the reliability of the surveillance system. There are specific considerations of key variables housed in the NVDRS dataset and pertaining to this dissertation that should be addressed.

NVDRS Calculated Variables

The NVDRS system uses a method of calculated variables indicated by the variable name followed by an underscore and letter “c”. This means the original raw data from data sources such as the coroner, medical examiner, or law enforcement have been combined to create one calculated variable by NVDRS abstractors for the state. These calculated variables will be prioritized as they are available for all selected variables in our analysis.

Incident Year

The “IncidentYear” variable indicates the calendar year the violent death occurred for single deaths. In cases where multiple victims are involved and died in different years, the incident year will reflect the first year in which any victim involved in the incident died (NVDRS, 2018). I will use the “IncidentYear” variable to analyze rates of our primary dependent variables (homicide, LI, and UD) by year. Due to data availability (see previous section on NVDRS Data Access) the year with the most comprehensive in the NVDRS is 2020.

Primary Dependent Variable: NVDRS Manner of Death

The recommended variable for analyzing manner of death in NVDRS is “AbstractorDeathManner_c”, the calculated variable for manner of death input by an abstractor after reviewing all findings from all sources of data (i.e., death certificates, coroner/medical examiner report and law enforcement reports) (NVDRS, 2018). In cases of missing data within the DeathMannerAbstractor variable, the AbstractorDeathManner_c is assigned a value for manner of death based on the following priority order of source documentation: 1) DeathMannerCME (coroner/medical examiner); 2) DeathMannerDC (death certificate); 3) DeathMannerLE (law enforcement). Deaths are designated by a coroner or medical examiner according to ICD codes; however, they may not uniformly apply the same criteria for underlying cause of death on death certificates (CDC, 2022). Therefore, NVDRS compiles all contributing documentation to try to achieve some standardization in death type and these may extend past standard responses on a death certificate. For example, persons shot by a law enforcement officer may be recorded as a “homicide” on a death certificate but called a “legal intervention” death in NVDRS (CDC, 2022).

Homicide

For the purposes of this analysis, data will be coded to capture all homicide ICD codes (X85-X99, Y00-Y09, Y87.1, U01, or U02). See table 3, for a full list of ICD-10 codes for each manner of death. Homicide is described as a death resulting from the intentional use of force against another where evidence indicates the use of force was intentional (Sanford and Hedegaard, 2008). Homicide counts will be used as the numerator in determining a prevalence per 100,000 with population estimates for the numerator coming from the National Vital Statistics System.

Undetermined (UD)

Deaths of undetermined intent (UD) with corresponding ICD-10 codes (Y10-Y34, Y87.2, and Y89.9) will be coded as “UD” for analyses. UD counts will be used as the numerator in determining prevalence per 100,000 with population estimates for the numerator coming from the National Vital Statistics System.

Legal Intervention

Legal intervention deaths include decedent who were killed by “a person with specified legal authority to use deadly force” (NVDRS, 2018) with corresponding ICD-10 code Y35. These persons may include law enforcement, military law enforcement, or other peace officer acting in the line of duty despite lawfulness or legality of the circumstances (NVDRS, 2018).

Independent NVDRS Variables

Primary Independent Variable: Race/Ethnicity

The “Race_c” variable is a calculated variable based on the binary responses entered by the data abstractor to 5 different race variables: White, Black or African American, Asian, Native Hawaiian or other Pacific Islander, an American Indian or Alaska Native (NVDRS, 2018). Persons with unknown race or ethnicity are coded as ‘Unknown’ (NVDRS, 2018). A victim with a “yes” response to more than one race is assigned the value “Two or more races” (NVDRS, 2018). I used the calculated “Race_c” variable to identify the American Indian or Alaska Native and White subgroups. Ethnicity is a calculated binary variable in NVDRS (RaceEthnicity_c) that identifies a person as “Hispanic or Latino” or “Not Hispanic or Latino” (NVDRS, 2018). The RaceEthnicity_c variable will be used to isolate non-Hispanic White decedents only; Hispanic and non-Hispanic AI/AN will be used together because of the small

size of the population and associated sample.

NVDRS Place of Death

Place of death is recorded for each decedent by “DeathState” and “InjuryZip”. Each will be used to subset samples according to each aim for the national, state, regional, and reservation (RL)/non-Tribal lands (NTL) analyses.

Individual & Social-level Variables

Sex

The NVDRS decedent variables are reported for “Sex” are (Male, Female, or Unknown) (NVDRS, 2018). Those values =Unknown will be included in my numerator to calculate a completeness for homicide and UD, then all “Unknown” values will be removed for further analysis.

Age

The NVDRS decedent variables for age are reported as a continuous numeric variable “AgeYears_c” and will be used as such for all descriptive statistics.

Education Level

Two NVDRS variables capture educational achievement, “EducationLevel” and “EducationYears” (NVDRS, 2018). I used the continuous “EducationYears” variable for the purposes of our comparisons in this study (NVDRS, 2018).

Homelessness

Homelessness could be an indicator of access level to environmental and social resources thus, the NVDRS “Homeless” variable will be used to classify decedents as homeless by coding “1”, or not homeless by coding “0” for each decedent.

Migration: Birthplace and State of Injury

To acknowledge the intersection of voluntary and involuntary migration among the AI/AN communities in the US we will examine differences in homicide victim's birthplace by state using the "BirthPlace" variable against the "DeathState" variable. A positive "migration" decedent was coded "1" if the recorded birth and death states are different (e.g., BirthPlace = "Oregon" and DeathState = "Nevada"). All other decedents whose birth and death state are the same will be coded as "0" to indicating 'No Migration'.

Incident-Level Variables

The NVDRS incident category variable captures the type of incident reported by responders to the incident and the weapon type variable indicates the type of weapon (if any) involved in the incident. These categories reflect the suspected cause of death and formal identification of victims involved by first responders.

Incident Category

The complete homicide incident independent categorical variable includes: 1) Single homicide; 2) Multiple Homicide; 3) Homicide(s) Followed by Legal Intervention; 4) Single legal intervention death; 3) Multiple homicide; 4) Mutual Homicide/Shootout; 5) Single Homicide Followed by Suicide; and 5) Homicide(s) Followed by Suicide(s), Over 2 Fatalities (CDC, 2022). UD incident categories include "Single Death of Undetermined Intent" or "Multiple Deaths of Undetermined Intent" for UD deaths (CDC, 2022). Legal intervention deaths are reported as either "Single Legal Intervention Death" or "Multiple Legal Intervention Deaths" (CDC, 2022).

Weapon-Type

NVDRS collects data on all mechanisms of violence that lead to a homicide. The

Weapon-Type variable includes the following categories: 1) Biological weapons; 2) Firearm; 3) Blunt instrument; 4) Drowning; 5) Explosive; 6) Fall; 7) Fire or burns; 8) Firearm; 9) Hanging, strangulation, suffocation; 10) Intentional neglect (e.g., starving a baby); 11) Motor Vehicle; 12) Non-powder gun; 13) Other (e.g. taser, electrocution, nail gun); 14) Other transport vehicle (e.g., trains, planes, boats); 15) Personal weapons; 16) Poisoning; 17) Shaking (e.g., shaken baby syndrome); 18) Sharp instrument; and 19) Unknown (NVDRS, 2018). Those values =Unknown will be included in my numerator to calculate a completeness for homicide and UD, then all “Unknown” values will be removed for further analysis. Firearm, as a main contributor, is selected for further analyses in aim 2.

Systems-Level Variables

The systems that feed data into the NVDRS surveillance system span across federal, state, and Tribal agencies. In an interest of comparing effectiveness of systems procedure across these agencies for the AI/AN population, the paper will look at four (migration, homelessness, toxicology, autopsy) system variables across all homicide incidents to identify any disparities.

Autopsy

In deaths that require investigation, a medical examiner, district attorney, or in some cases a family member may order an autopsy be performed. The autopsy variable was coded “1” for those cases who received a full or partial autopsy and “0” for deaths where no autopsy was either ordered or performed.

Toxicology

Toxicology screening was included as a dichotomous variable to examine prevalence of screening for each subset of homicide decedents. The variable “NoToxicologyAvailable” was coded “0” for those who did have a toxicology screening post-mortem and “1” for those victims

who did not.

Law Enforcement Narrative

The “NarrativeLE” variable is a free text variable with the narrative of the event from first-responders. The narrative summary describes information about the incident, victims, and suspect(s) (CDC, 2022). According to the NVDRS coding manual (Version 6,0; CDC, 2022), the outline of types of data elements coming from law enforcement narratives are:

- Incident narrative
- Person type
- Zip code, county
- Age/sex/race/ethnicity
- When and where (injury/death)
- Additional person descriptors
- Wounds
- Circumstances
- Victim-suspect relationship
- History of victim abuse
- Suspect was victim caretaker
- Weapon type
- Firearm descriptors
- Poison details

U.S. Census Bureau

U.S. Census Bureau population estimates for Race categories (AI/ANs and NHW) will be used as the denominator in calculating manner of death-specific (homicide, UD, LI) mortality rates for all groups by place in this study. There is a severe lack of accurate population data for AI/ANs in the U.S. and this is the best match to the NVDRS data available at this time.

USEPA Tribal Lands

Zip code was the unit of analysis for of this study to differentiate between AI/AN homicide deaths on Federal Indian Reservation lands (RL [including Trust lands]) and Non-Tribal Lands (NTL). ArcGIS intersecting zip code layers and Census-identified Tribal Lands

were developed by the United States Environmental Protection Agency (USEPA) using ArcGIS (2016). The Zip Code to Tribal Lands Lookup Table is a dataset managed by the U.S. EPA Office of Environmental Information. The digital table provides a list of the intersections between U.S. Census Zip Code Tabulation Areas (ZCTAs) and the USEPA Tribal Lands spatial data. The tool allows for users to look up all Tribal lands that intersect or overlap with any given zip code in the U.S. The purposes for creating the table were to aid the USEPA in identifying Tribal resources, however it is a powerful tool for a geospatial identification of Tribal lands as no other comprehensive tool exists for Tribal lands-based research (Santiago-Torres et al., 2021). ZCTAs include all lands in the geographic area and some overlap with non-Tribal lands (NTLs) is expected. Decedent observations will be as coded “1” or positive when their “InjuryZip” correlates to an overlapping USEPA-identified RL ZCTA and all others will be coded as “0” for negative or no overlap (NTL).

Regionality in AI/AN Health Research

Regionality and duality in residence FR/NTL among indigenous populations in the U.S. is especially important research consideration due to the nature of indigeneity and its reflexivity with the natural landscape and resources, data management, policy, and representation, among other characteristics of culture. Indigenous knowledge and traditional cultural practices maintained the health of AI/AN for thousands of years before colonial contact. Acknowledging these cultural regions is common anthropological practice to tailor research methods and social services (e.g., Indian Health Service) to distinct cultural groups. NVDRS participating states in the dataset will be analyzed collectively then grouped into ten modified IHS regions as follows: Alaska, Albuquerque, Bemidji, Billings, California, Great Plains, Nashville, Navajo (modified to include Phoenix Area and Tucson Area), Oklahoma, and Portland regions (See Table 5).

Study Sample

Based on this inclusion criteria, the resulting NVDRS Sample included a total of 37,472 Homicide decedents, 2,184 AI/AN and 35,288 NHW, between 2005-2020. AI/AN homicide decedents included 1,654 male and 530 female and ranged from 0-93 years old. NHW homicide decedents included 22,956 male and 12,331 female with an age range of 0-101 years. Legal intervention-specific homicide (LI) accounted for 3,166 total decedents, 184 AI/AN and 2,982 NHW.

The NVDRS UD sample included 35,149 total observations, 807 AI/AN and 34,342 NHW between 2005-2020. AI/AN UD decedents included 516 males and 291 females with an age range of 0-93. NHW UD decedents included 21,381 males and 12,961 females with an age range of 1-100 years.

Analytic samples and specific methods for each aim are outlined in the following section. Table 2 lists the data and variables for each aim.

Aim 1 Analyses

We analyzed state-level National Violent Death Reporting System (NVDRS) data for the most comprehensive available year (2020), including all U.S. states, the District of Columbia, linked to U.S. Census Bureau 2020 population estimates, and USEPA ZCTAs. The sample for includes all race classified decedents of homicide or undetermined intent identified as either 1) American Indian or Alaska Native (Hispanic and non-Hispanic) and 2) non-Hispanic White recorded in the National Violent Deaths Reporting System for 2020. The sample will include decedents from both sexes (male and female) and children and adults from all age groups.

Inclusion criteria for my study sample will be based on race classification. Race classified

American Indian/Alaska Natives (AI/AN) defined as persons with origins among any of the original people of North America (and Alaska) who maintain cultural identification through Tribal affiliation community recognition (CDC, 2021) will be included including those recorded as having Hispanic ethnicity. The primary dependent variable is death rate for homicide, UD, and LI. The primary independent variables are race/ethnicity (AI/AN and NHW) and place (RL/NTL). A multilevel design was employed to characterize rates of homicide and UD at the 1) state; 2) regional; and 3) RL vs. NTL levels.

Mortality Rates

The equations for each mortality rate and place designation are:

Total U.S. [Race] [Manner of Death] Mortality Rate =

$$\frac{\text{Total number AIAN [Manner of Death]}}{\text{Total number AIAN Population}} \times 100,000$$

Total [State] [Race] [Manner of Death] Mortality Rate =

$$\frac{\text{Total number AIAN [Manner of Death] per State}}{\text{Total [State] number AIAN Population}} \times 100,000$$

Total [Region] [Race] [Manner of Death] Mortality Rate =

$$\frac{\text{Total number AIAN [Manner of Death] per Region}}{\text{Total [Region] number AIAN Population}} \times 100,000$$

Due to the inaccessibility of AI/AN race/ethnicity population data for 2020 by ZCTA, reliable population denominators for RL and NTL distinction are not available at the time of this study. All RL and NTL rates are therefore suppressed in Tables 4-7, counts that meet the reporting level (n=5) are provided at the state level.

Linear Regression

We fit multiple linear regression models that relate homicide and UD rate (Y) to the Race/Ethnicity (AI/AN, NHW) and place (RL, NTL) binary variables in the following equation:

$$\hat{Y} = \hat{\beta}_0 + \hat{\beta}_1 \text{Race/Ethnicity} + \hat{\beta}_2 \text{RL/NTL}$$

Hypotheses testing of the null hypothesis will determine whether the null hypothesis ($H_0 = 0$) is true where Race/Ethnicity and RL/NTL do not contribute to the predicted rates of homicide and UD or whether the alternate hypothesis ($H_1 \neq 0$) where either Race/Ethnicity or RL/NTL contributes to predicted rates of homicide and UD.

Statistical Analysis

All analyses will be performed using R Statistical Software (v4.1.3, R Core Team 2022). Descriptive statistics were used to report counts, percentages, and measures of central tendency for individual, social, and systems characteristics for the full sample and AI/ANs and non-Hispanic whites (NHW). Mortality rates for each dependent variable (homicide, LI, UD) were calculated using population estimates from the U.S. Census Bureau for 2020 as the denominator for each place designation (nation, state, IHS region) and expressed per 100,000 population. To explore my hypotheses that race, and place play a role in levels of homicide, LI, and UD, I have fit a simple linear regression model with the continuous rate per 100,000 as my main dependent variable to test whether there is a relationship with independent variables Race/Ethnicity and Place. These methods are congruent with NVDRS suicide rate calculations reported in chapter 2 (Leavitt, et al., 2018). Odds ratio and 95% confidence intervals will be computed to see if there are differences in homicide, UD between subsets and by place of death. Statistical significance

level of $\alpha=0.05$ were used to determine results.

Aim 2 Analyses

We analyzed state-level data from the National Violent Death Reporting System (NVDRS) for all race/ethnicity classified AI/AN and NHW recorded as a decedent of homicide or UD during years 2005-2020, including all ages and both sexes. All other race and ethnicity classifications are excluded. Each decedent's "InjuryZip" were linked with overlapping RL ZCTAs ($n=2,292$) to determine place designation as RL or NTL. The final analytic sample included 72,621 total decedents (37,742 homicide and 35,149 UD) with 5,566 identified as RL decedents and 67,055 NTL.

The primary dependent variable for this analysis included observations for three dichotomous death investigation procedures. The primary independent variable is race/ethnicity (AI/AN and NHW). The NVDRS variables "AutopsyPerformed", "NoToxicology", and "NarrativeLE" were used to compare the proportions completed by race/ethnicity and place. Our hypothesis is that the AI/AN racial/ethnic group experiences contact with systemic procedures differently than NHWs and that places like reservations introduce barriers to thorough death investigations through jurisdictional confusion.

Select covariates include age, sex, education level, homelessness, migration, incident type, and weapon type (firearm for homicide and LI, poisoning for UD). As an exploratory variable, we tested our sample for completeness and missing values (including all "unknown" and "NA" data field entries).

Statistical Analysis

All analyses were performed using R Statistical Software (v4.1.3, R Core Team 2022). Most of the variables in the dataset are categorical or dichotomous. For these variables,

frequency distributions and proportions were run for the full sample of each manner of death and stratified by race/ethnicity and place of death (RL and NTL). Missing values for all selected variables will be used to calculate percentage of completeness and compared between groups as outlined in our exploratory aim 2-2b, then removed for further analyses. Range, mean, and standard deviation were obtained for the continuous age variable and stratified by race and place. Pearson's Chi-square tests of independence and Fisher's exact tests were conducted for primary independent variables to assess for differences in distribution by race/ethnicity. A 95% confidence interval and odds ratio (OR) to test the strength of any associations identified were computed for each test using a statistical significance level of $\alpha=0.05$ to determine results.

Table 1. Overview of specific aims: Datasets, participants, variables

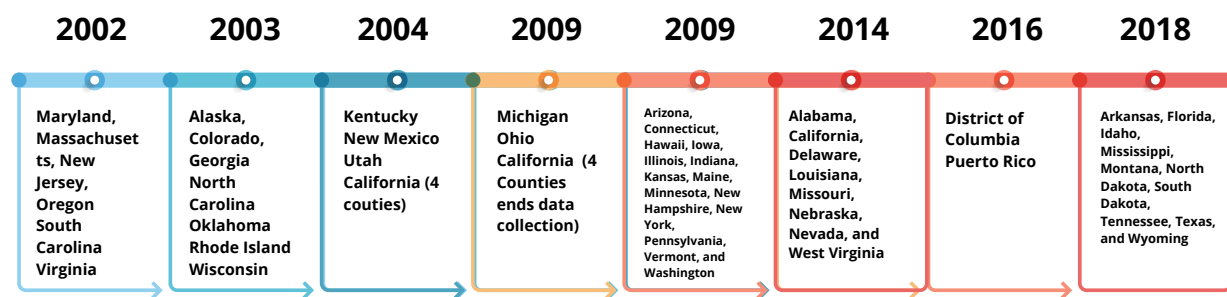
X	<i>Specific Aim 1</i>	<i>Specific Aim 2</i>
Datasets		
NVDRS	X	X
USEPA ArcGIS Table	X	X
National Vital Statistics Population Estimates	X	X
Participants		
Race classified American Indian and Alaska Native (AI/AN) decedents of Hispanic and non-Hispanic ethnicity (homicide, undetermined(UD), and legal intervention (LE))	X	X
Race classified non-Hispanic White decedents (homicide, undetermined(UD), and legal intervention (LE))	X	X
Primary Independent Variables	Race/Ethnicity	Race/Ethnicity
Place of Death – United States	X	X
Place of Death – IHS Region	X	X
Place of Death – RL/NTL	X	
Primary Dependent Variables	Homicide and Undetermined Intent (UD) prevalence rate	Homicide and Undetermined Intent (UD) prevalence rate
Individual-Level Variables		
Sex (Male or Female)		X
Age (Groups)		X
Education (Level)		X
Homelessness		X
Migration		X
Incident-Level Variables		
Incident Category		X
Weapon Type		X
Systems-Level Variables		
Autopsy Performed		X
Toxicology		X
Law Enforcement Narrative		X

Table 2. ICD-10 External Causes of Death Codes for Manners of Death Meeting the NVDRS Case Definition IDC-10 Codes

Manner of death	Death ≤1 year after injury	Death >1 year after injury	Deaths any time after injury
Intentional self-harm (suicide)	X60–X84	Y87.0	U03 (attributable to terrorism)
Assault (homicide)	X85–X99, Y00–Y09	Y87.1	U01, U02 (attributable to terrorism)
Event of undetermined intent	Y10–Y34	Y87.2, Y89.9	N/A
Unintentional exposure to inanimate mechanical forces (firearms)	W32–W34	Y86	N/A
Legal intervention (excluding executions, Y35.5)	Y35.0–Y35.4, Y35.6, Y35.7	Y89.0	N/A

Source: Centers for Disease Control and Prevention. National Violent Death Reporting System (NVDRS) Coding Manual Revised [Online] 2021 National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (producer). Available from URL: www.cdc.gov/injury

Figure 3. NVDRS State Entry by Year



Data availability by state and year of entry into NVDRS

Note: Collection of NVDRS data commenced the year following system entry

Table 3. Physical Indian Health Service Areas in the U.S. – States & Tribal Nations (or population)

Physical IHS Areas	States Included	Tribal Nations (n) Or Population AI/AN (n)
Alaska Area	Alaska	228
Albuquerque Area	New Mexico, Colorado, Texas, Utah*	27
Bemidji Area	Illinois, Indiana, Michigan, Minnesota, Wisconsin	34
Billings Area	Montana, Wyoming	70,000 AI/AN
California Area	California, Hawaii Ke Ola Mamo	109
Great Plains Area	North Dakota, South Dakota, Nebraska, Iowa	17
Nashville Area	Texas*, Arkansas, Louisiana, Missouri, Mississippi, Tennessee, Kentucky, Indiana, Illinois*, Indiana*, Ohio, West Virginia, Virginia, North Carolina, South Carolina, Georgia, Florida, Maryland, Pennsylvania, New York, New Jersey, Vermont, Massachusetts, Connecticut, New Hampshire, Rhode Island, Maine	36
Navajo Area	Arizona, Nevada, New Mexico*, Utah	244,000 AI/AN
Oklahoma City Area	Oklahoma	
Phoenix Area**	Arizona, Nevada, Utah	140,000 AI/AN
Portland Area	Oregon, Washington, Idaho	43
Tucson Area**	Arizona	2

* States that were duplicated in multiple service areas were reorganized to one

** Entire areas where the city is co-located in a larger geographic area were combined with the larger service area (i.e., Phoenix and Tucson combined to Navajo Area)

* Utah was only included in the Navajo Area

* Texas was only included in the Albuquerque Area

* Illinois was only included in Bemidji Area

* Indiana was only included in Bemidji Area

* New Mexico was only included in the Navajo Area

** Phoenix Area was combined with Navajo Area

** Tucson Area was combined with Navajo Area

CHAPTER 4: RESULTS

In this chapter I report the results of the analyses conducted to test each research hypothesis for each specific aim. A total of 48 NVDRS states, and the District of Columbia reported 75,787 AI/AN and NHW deaths from violent homicide, undetermined (UD), and legal intervention (LI) between 2005-2020. Homicide (n=37,472, 49.4%) accounted for the majority of violent deaths. Deaths of undetermined intent (UD) (n=35,149, 46.4%) followed homicide, and legal intervention (LI) (n=3,166, 4.2%) had the lowest number of deaths. A total of 2,293 zip code tabulation areas (ZCTA) were identified as overlapping with reservation lands (RL) using USEPA data. ZCTAs were linked to injury zip codes in NVDRS to classify all manners of death by RL or all other non-Tribal Lands (NTL). 5,939 (7.8%) of all incidents were classified as RL cases. Homicides (n=3,567, 60.1%) accounted for the majority of RL cases, UD (n=1,999, 33.0%) were next, and LI (n=373, 6.3%) had the least. Of all RL cases, the majority were identified as NHW (n=4,398, 74.1%). However, among the AI/AN sample alone, 48.5% of all incidents occurred on RL (n=1,541) compared to 7.2% of NHW (n=5,939).

Results for aim one include the sample of homicide (n=5,346) and UD (3,555) decedents from 2020 only. Based on racial classification, homicide and UD frequency, distribution by place, and population size, state and combined regional homicide rates calculations are expressed per 100,000 population for aim one. A summary of linear regression analyses using aim one rate calculations is provided at the state and regional levels. Aim two encompasses the entire sample for each violent death. Descriptive statistics by race/ethnicity (AI/AN and NHW), and place (reservation lands [RL], non-Tribal lands [NTL]) are provided for select individual and social characteristics, incident variables, and system variables. A summary of results of the Pearson's chi-square tests of independence of system-level variables is provided.

Aim 1 Results

In aim 1 we determined 2020 mortality rates for American Indian/Alaska Natives by manner of death (homicide, undetermined[UD], and legal intervention [LI]) and compare by place of death (nation, state, region, reservation lands) and to non-Hispanic whites.

2020 NVDRS Homicides

The sample consisted of 5,346 decedents of homicide in 2020. AI/AN accounted for 330 (6.2%) vs. 5,018 (93.8%) NHW of all sample decedents. Within this NVDRS homicide sample, decedents identified as NHW were reported for all states with the exception of Florida and Hawaii where zero total NVDRS homicide were recorded. Despite the presence of a U.S. Census calculated population of AI/AN, an additional 18 states and territories reported zero AI/AN homicides incidents in the NVDRS for any years between 2005-2020. The remaining 32 states all reported between 1-62 AI/AN and 1-251 NHW retained for further analyses. However, cells with n-sizes less than 5 are suppressed and rates are calculated using cell sizes of 20 or greater following CDC policy.

The overall national homicide rate for AIANs in the U.S. was 8.9, over three times the rate of NHW at 2.6 per 100,000 population. Decedents of AI/AN racial classification were reported for 32 states while decedents of racial/ethnic NHW identity were reported for 48 states and the District of Columbia in 2020. Incidents occurring within ZCTAs overlapping reservation lands (RL) were reported in 20 states for AI/ANs and 28 states for NHWs (Table 4). A total of 18 states reported incidents of homicide for both AI/AN and NHW on RL and NTL for 2020 (Alaska, Arizona, California, Idaho, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, Utah, Washington,

and Wyoming). We hypothesized that there would be difference in homicide rates between racial and ethnic groups and that those differences would be most prominent on RL, and within states associated with the Alaska Area, the American Southwest and Midwestern regions.

State-Level Homicide Rates

State homicide mortality rates among the AI/AN population ranged from 9.0 in Oklahoma to 36.0 in South Dakota and rates for NHWs ranged from 1.2 in New York to 6.5 in West Virginia. State differences by race and ethnicity showed that among states who reported AI/AN homicides (n=32), all available rates for AI/AN (n=7) were higher than NHWs. The most visible disparities between state AI/AN homicide rates were in South Dakota where the 2020 rate of AI/AN homicide was 16 times (AI/AN=36.0, NHW=2.2) that of NHWs based on respective state populations. Other states reporting drastic disparities by population calculated rates were Alaska at over nine times (AI/AN=24.2, NHW=2.5), Montana at seven times (AI/AN=29.6, NHW=4.2), and Arizona at nearly six times (AI/AN=19.4, NHW=3.3) the rate of each states NHW homicide by population.

State RL and NTL Homicide

A total of 9.6 percent of all homicides in 2020 occurred on or near Indian Country. Approximately 32.9 percent of those incidents involved AI/AN decedents compared to 67.1 percent identified as NHW. Reportable AI/AN RL state homicide counts ranged from five in California to 45 in Arizona. NHWs reported between five in Idaho and Kansas to 120 in Oklahoma in 2020. On NTL, AI/AN homicides ranged from six in Minnesota to 24 in North Carolina whereas NHWs ranged from nine in Wyoming to 251 in Ohio. Due to the

inaccessibility of population data by race/ethnicity and ZCTA, rate calculations for available counts by RL/NTL were not included at the time of this publication.

State Homicide Multivariable Model

A regression model was run for all state rates; however, CDC policy prohibits use of rate calculations using cell sizes less than 20, which prevented all RL and NTL rates and many total state rates from inclusion. Based on the fitted model, there is a statistically significant relationship between rates of state homicide, race/ethnicity, and place (RL/NTL) ($p < .0001$). The model had an adjusted R-square of 0.09 indicating our model accounts for nine percent of the variation in state homicide rates.

Regional-Level Homicide

Regional homicide rates were higher for AI/ANs compared to NHW in nine of ten regions. Rates by region ranged from 6.0 in the Bemidji Area to 30.7 in the Billings Area ($M=13.6$, $SD=9.8$) for AI/ANs. The NHW population showed rates from 1.5 in the California Area to 6.2 in the Oklahoma Area ($M=2.8$, $SD=1.3$). Overall regional homicide rates by population were highest among AI/ANs in the Billings Area which includes Montana and Wyoming at 30.7 and the Oklahoma Area for NHWs at 6.2 per 100,000 population. Differences by race and ethnicity show rates of homicide were in stark contrast with Great Plains Area reporting almost 13 times the rate for AI/AN compared to White (24.6 and 1.9 respectively). Other regional disparities include Alaska Area at over nine times ($AI/AN=24.2$ and $NHW=2.5$), Billings Area at eight times ($AI/AN=30.7$ and $NHW=3.6$), and Navajo Area at five times the rate of NHW in the same region. The closest rates of homicide between AI/ANs and NHW was in the Nashville Area where AI/AN reported 1.6 times the rate of NHWs.

Regional RL and NTL Homicide Rates

All ten IHS regions reported incidents in ZCTAs overlapping reservation lands (RL). Incidents were reported for both racial and ethnic groups (AI/AN and NHW) in nine out of ten regions and reportable counts were present for six regions for AI/AN and all ten regions for NHW. Due to the inaccessibility of population data by race/ethnicity and ZCTA, rate calculations were not calculated at the RL/NTL level at the time of this publication.

Regional Homicide Multivariable Model

A regression model was run for all regional rates; however, CDC policy prohibits use of rate calculations using cell sizes less than 20, which prevented all RL and NTL rates and many total state rates from inclusion. Based on the fitted model, there is a statistically significant relationship between regional rates of regional homicide, race/ethnicity, and place (RL/NTL) ($p=.001$). The model had an adjusted R-square of 0.25 indicating our model accounts for 25 percent of the variation in regional homicide rates.

2020 NVDRS Undetermined Intent (UD)

Deaths of undetermined intent (UD) were reported for most U.S. states and territories with the exception of Florida, Guam, and Hawaii in 2020. A total of 23 states reported UD decedents for AI/ANs. The total UD sample consisted of 3,555 decedents, mostly NHW ($n=3,459$) with AI/AN accounting for 2.7 percent of decedents. Racial classification, UD frequency, distribution by place, and population size, have determined state homicide rates and calculations are expressed per 100,000 population for each state (Table 5). The overall rate of UD for AI/ANs in the U.S. in 2020 was 2.6 and NHWs was 1.8.

State-Level Undetermined (UD) Rates

Rates of AI/AN UD were reportable only in Arizona (6.9), nearly three times the rate for NHWs in the state (2.5). NHW rates of UD ranged from 0.3 in California with most falling under 2.6. Two outliers were identified for NHWs in Michigan at 5.5 and an alarming 35.2 in Maryland. The only other reportable count of UD for AI/ANs was in Alaska with 14 compared to 19 for NHWs.

State RL and NTL Undetermined (UD)

Incidents occurring within ZCTAs overlapping reservation lands (RL) were reported for 22 states, 2 reporting only AI/AN RL incidents, and 13 reporting only NHW RL incidents. A total of 7 states reported UD incidents for both AI/AN and NHW on RL and NTL (Alaska, Arizona, California, Colorado, Montana, Nevada, and New Mexico). Approximately 4.2 percent of all AI/AN and NHW UD deaths occurred in RL ZCTAs, with the majority of those identified as NHW (73%). Due to the inaccessibility of population data by race/ethnicity and ZCTA, rate calculations for RL and NTL decedents were not included at the time of this publication.

State Undetermined (UD) Multivariable Model

A regression model was run for all state rates; however, CDC policy prohibits use of rate calculations using cell sizes less than 20, which prevented all RL and NTL rates and many total state rates from inclusion. Based on the fitted model for state UD, race/ethnicity, and place (RL/NTL), we determined there is a statistically significant relationship ($p=.001$). The model had an adjusted R-square of 0.04 indicating our model accounts for four percent of the variation in state UD rates.

Regional Undetermined (UD) Rates

Regionally, AI/AN and NHW rates of UD were highest in the Navajo Area (AI/AN=5.7, NHW=2.2). UD was higher for AI/AN in reportable regions compared to NHWs with the Navajo and Portland regions displaying a two-fold difference. Despite the high reporting of AI/AN homicides in the Oklahoma region, zero UD decedents were reporting in the region in 2020. The remaining six regions reported UD counts that did not meet the reporting threshold ($n=20$) for CDC policy restrictions and therefore were suppressed.

Regional Undetermined (UD) Multivariable Model

A regression model was run for all regional rates; however, CDC policy prohibits use of rate calculations using cell sizes less than 20, which prevented all RL and NTL rates and many total state rates from inclusion. Based on the fitted model for regional UD, a statistically significant relationship ($p=.001$) between race/ethnicity, and place (RL/NTL) was identified. The model had an adjusted R-square of 0.02 indicating our model accounts for two percent of the variation in regional UD rates.

Legal Intervention (LI)

The sample of LI decedents from 2020 did not allow a meaningful analysis at the state and regional level. All years (2005-2020) provided a reasonable sample size; therefore, an analysis of LI is provided in the next section featuring results from the aim 2 analyses.

Aim 2 Results

In aim 2 we describe individual and social (age, sex, education level, homelessness, migration), incident (incident type and weapon type), and system (homelessness, autopsy, toxicology, law enforcement narrative completion) characteristics for AI/AN violent death

(homicide, undetermined, legal intervention) decedents from 2005-2020 and identify any associations with completion of system-level variables (autopsy, toxicology, and law enforcement narrative) by place of death (RL or NTL) compared to NHWs.

2005-2020 Homicide

The homicide sample included 37,472 NVDRS decedents between the years 2005 and 2020. Table 8 shows all descriptive characteristics for the homicide sample selected for this study. The majority of all homicides involved a single decedent (80.2%), and firearm was the primary weapon type reported (55.5%). Homicide victims' ages ranged from 0-101 years, most decedents were male (65.7%), and had a high school diploma, GED, or some college (44.7%). Social characteristics reflect a low homelessness reported (2.6%) and approximately 39.1% of decedents migrated from their birth state prior to their death. Systemically, high levels of autopsy, toxicology, and law enforcement narrative presence were observed for the sample. We hypothesized that a higher proportion of homicide among AI/AN would occur on RL and that death investigation data (autopsy, toxicology, law enforcement narrative) presence would be lower than NHWs and lower on RL.

Race, Ethnicity, and Homicide

Decedents of homicide between 2005-2020 were predominantly NHW (n=35,288, 94.2%) compared to AI/AN (n=2,184, 5.8%). Among the portion of AI/AN homicides, the age of decedents ranged from 0-93 years (M=34.1, SD=15.7), most were male (74.7%), and reported an educational achievement level of high school diploma, GED, or some college (44.9%). Socially, AI/AN decedents reflected a 5.0 percent homeless status and 22.7 percent migration status. Systems-level characteristics of AI/AN homicide decedents show high autopsy (97.3%) and

toxicology (91.3%) performance, with slightly lower presence of a law enforcement narrative (74.8%). The NHW portion of the sample ranged in age from 0-101 years ($M=41.2$, $SD=19.8$), were mostly male (65.1%), and had high school diploma, GED, or some college (44.6%) reported as their highest education level achieved. Homelessness was low for NHWs at 2.4 percent and 40.0 percent were categorized as positive for migration. Systemically, autopsy (96.5%), toxicology (85.5%), and presence of a law enforcement narrative (86.8%) all had high reports.

Differentiation between AI/AN and NHW decedent were most prominent by age group, education level, migration status, weapon type, and law enforcement narrative. More AI/AN decedents were identified as an adult between 18-55 years (79.6% vs. 66.3% NHW) while NHWs reported more seniors 55 years and older (23.5% vs. 9.6% AI/AN). NHW reported higher numbers of college degrees attained by decedents (12.4%) compared to AI/AN (4.9%). Weapon types other than firearms differed specifically for sharp instruments and personal weapons, where AI/AN reported more (22.0% vs. 14.7% NHW) sharp instruments; 9.6% vs. 6.5% NHW personal weapons). Finally, law enforcement narratives were captured for 86.8 percent of NHW decedents, compared to only 74.8 percent for AI/ANs.

Reservation Lands (RL) and Homicide

When considering the location of the injury and co-location with RL-identified ZCTAs, clearer differences are revealed between AI/AN and NHW homicide decedents. AI/AN decedents were younger ($M=33.8$ vs. $M=41.0$ NHW), a higher percentage had a 12th grade or less education level (41.4% vs. 28.1% NHW), and a much lower amount were reported to have migrated (20.0%) compared to NHW (49.2%). NHWs had over two time the proportion of decedents who had attained a college degree on both RL (13.4% vs. 4.9% AI/AN) and NTL

(12.3% vs. 4.7% AI/AN). Homelessness reported was highest for AI/AN NTL decedents at 7.2 percent, with the next closest being RL NHW (3.0%). Slightly more NTL AI/AN homicide decedents had migrated (25.2% vs. 20.0 RL AI/AN) but overall, NHW migrated most, and the highest reported groups were NHW on RL at 49.2%, compared to NHW on NTL (39.4%) suggesting higher mobility overall in the NHW population. The most variation in weapon type was observed in the AI/AN RL group where only 38.4 percent were attributed to firearm and a higher prominence of sharp instrument (26.9%), blunt instrument (10.8%), and personal weapons (10.3%) filled the gaps. No major differences were observed for autopsy or toxicology performance, but the proportion of present law enforcement narrative was lowest for the RL AI/AN group at 68.0 percent, with the next lowest being NTL NHWs at 77.2 percent.

Homicide Hypotheses Testing

Results from the chi-square test of independence and odds ratios (OR) for each select homicide variable are reported in Table 8. Tests performed for race/ethnicity against all four variables met our significance level for homicide. A chi-square test of independence was performed to examine the relationship between race/ethnicity and primary UD weapon type (firearm). The relationship between these variables was significant $X^2(\text{NA}, N = 36,929) = 69.06$, $p < .001$. NHW homicide decedents were more likely (OR 1.44 95% CI 0.1.32, 1.57) than AI/AN to have a firearm as the primary weapon type compared to AI/AN. NHW were more likely (OR 1.77 95% CI 1.52, 2.07) than AI/AN to have a toxicology performed after death than AI/ANs. Lastly, the test results for law enforcement narrative were significant, $X^2(\text{NA}, N = 37,472) = 248.96$, $p < .001$ X^2 . NHW homicide decedents were less likely (OR 0.45 95% CI 0.45, 0.50) than AI/AN to have a blank law enforcement narrative. The smallest difference observed was for race/ethnicity and autopsy performance. While the test was significant $X^2(\text{NA},$

$N = 37,377$) = 5.42, $p = .02$, it was small and NHW homicide decedents were slightly less likely (OR 0.71 95% CI 0.52, 0.92) than AI/AN to have an autopsy performed after death than AI/ANs.

2005-2020 Undetermined (UD)

Table 9 shows all descriptive characteristics for the 35,149 UD decedents between 2005-2020. The majority of decedents were classified as single UD deaths (98.9%), were males (62.3%), and involved poisoning (70.5%) as the primary weapon type. UD decedents' age ranged from 0-100 with high school diploma, GED, or some college (49.9%) reported as the highest level of education completed. Socially, the majority of UD decedents were not homeless (90.6%) and had not migrated (62.5%). There was a high level of completion of systems-level autopsy, toxicology, and law enforcement narrative completion for the total sample. We hypothesized UD frequency among AI/AN would be higher on NTL and that death investigation variables would have higher completion compared to RL UD decedents.

Race, Ethnicity, and Undetermined (UD)

UD among AI/AN accounted for 2.3 percent ($n=807$) of the total sample and had wider variation in incident type. Poisoning was the predominant weapon type overall. NHW reported a higher percentage of poisoning than AI/AN. Almost a third of AI/AN UD deaths had an "Unknown" weapon type contributing to their death (AI/AN=29.4%, NHW=9.2). AI/ANs reported lower age (range= 0-93, $M=36.8$, $SD=18.9$), education level (80.5% earned a high school diploma, GED, or less, 3.4% earned a college degree) compared to the NHWs (age range=0-100, $M=42.5$, $SD=16.8$; 69.5% earned a high school diploma, GED, or less, 12.5% earned a college degree). Differences observed in social characteristics include only slightly

higher homelessness for AI/ANs (4.7%) and negative migration (72.2%). Systemic investigative procedures were slightly lower (-1-2%) for AI/AN UD decedents compared to NHWs.

Reservation Lands and Undetermined (UD)

As observed in previous sections, a closer look at the socio-graphic areas overlapping reservation lands (RL) introduces more contrasts between AI/ANs and NHWs. UD decedents co-located within ZCTAs categorized as RL equaled $n=1,999$ decedents between 2005-2020. The majority of RL UD decedents were NHW (80.3%), however, nearly half (49.0%) of AI/AN UD decedents were RL deaths. Victims were mainly male (58.2%) with the higher proportion of females reported for RL for both racial and ethnic groups (AI/AN=37.7%, NHWs=42.8%). RL AI/AN decedents also reflected the lowest age ($M=36.1$, $SD=20.8$) by race, ethnicity, and place, and the highest proportion of child decedents (0-17 years=19.6%). Educational achievement was lower on RL for both groups with 80.6 percent of AI/AN decedents earning a high school diploma or GED and 3.6 percent earning a college degree, compared to 77.9 percent and 15.0 percent for NHW respectively. Higher reports of “Unknown” entries were associated with NTL for both groups (AI/AN=18.1% vs. 13.7%, NHW=17.5% vs. 7.0%).

Undetermined (UD) Hypotheses Testing

Results from the chi-square test of independence and odds ratios (OR) for each select UD variable are reported in Table 9. The test for autopsy performed did not meet our significance level. A chi-square test of independence was performed to examine the relationship between race/ethnicity and primary UD weapon type (poisoning). The relationship between these variables was significant. NHW UD decedents were far more likely (OR 7.41 95% CI 6.31, 0.8.74) than AI/AN to have a poisoning as the primary weapon type. The test for UD toxicology

was significant $\chi^2(\text{NA}, N = 35,149) = 25.29, p < .001$, which suggests NHW homicide decedents were less likely (OR 0.57 95% CI 0.46, 0.72) than AI/AN to have a toxicology performed after death. Lastly, the test results for law enforcement narrative were significant, $\chi^2(\text{NA}, N = 35,149) = 12.03, p < .001$. NHW UD decedents were less likely (OR 0.74 95% CI 0.62, 0.88) than AI/AN to have a blank (missing) law enforcement narrative than AI/ANs.

2005-2020 Legal Intervention (LI)

The legal intervention (LI) sample included 3,166 total decedent recorded in the NVDRS between 2005-2020. Table 10 shows all descriptive characteristics for the homicide sample selected for this study. The majority of LI decedents were identified as NHW (94.2%) while AI/AN represented the remaining 5.8 percent. The majority (>94% AI/AN and NHW) of all LI incidents were classified as single LIs (one decedent) and were as a result of a firearm (>91% AI/AN and NHW) and were identified as male decedents (>94% AI/AN and NHW).

Race, Ethnicity, and Legal Intervention (LI)

NVDRS AI/AN decedents of LI were categorized as single legal interventions (96.7%) with 94.6 percent of all incidents involving a firearm. Social and individual characteristics of AI/AN LI decedents show decedents had a mean age of 34.8 years (SD=10.6) and were predominantly male (95.1%). Most decedents had a high school diploma, GED, or some college (59.2%), had very little homeless status reported (87.0% “Unknown”), and the majority had not migrated (70.7%, meaning they were killed in the same state as their reported birth state in NVDRS). A look at the systemic death investigation procedures captured in NVDRS shows autopsy and toxicology performance were high at 98.4 percent and 95.1 percent respectively. There was slightly less completion of a law enforcement narrative at 83.2 percent.

Decedents identified as NHW were also predominantly single intervention incidents (94.8%) with 91.9 percent involving a firearm. The mean age of NHW decedents was 40.6 years (SD=13.5) and the majority (94.7 %) were male. More NHW LI decedents were reported in the high school, GED, or some college category (54.2%) than any other, the majority were identified as not homelessness (88.8%), and 55.8 percent of decedents had not migrated prior to death. At the systems level, NHW had high autopsy and toxicology performance (97.9% and 91.3%) and a law enforcement narrative was present for 84.9 percent of all incidents.

Differences were observed between AI/AN and NHW LI decedents on the individual, social, and systems levels of this analysis. The major difference was in the age of LI decedents where the range for AI/AN was 14-67 (M=34.8, SD=10.6) compared to NHW who reflected a range of 12-91 (M=40.6, SD=13.5) suggesting the AI/AN population loses more young persons to LI and primarily within years where potential social and economic capital is high. The highest number of LI decedents had a high school diploma, GED, or some college category. AI/AN reported 31 percent as having less than a 12th grade education compared to 18.3 for NHWs. At the other end of the education gradient, NHW reported 11.4 percent of all LI decedents had a college degree, whereas AI/AN reported only 4.9 percent. Social characteristics differed drastically for homeless status where 87.0 percent of AI/AN decedents had an “Unknown” status reported compared to just 5.9 percent for NHWs. With regard to migration status, a larger portion of AI/AN had died in the same state they were born in compared to NHWs (70.7% and 55.8% respectively). No major differences were observed between the groups for presence of a law enforcement narrative.

Reservation Lands (RL) and Legal Intervention (LI)

After categorizing LI incidents by ZCTAs overlapping RL, 373 incidents were co-located with RL. Nearly half of all AI/AN incidents occurred on RL (48.4%), compared to NHWs (9.5%). Most incidents were identified as a “single legal intervention death” with the highest report for firearm as a weapon type occurring for RL AI/ANs (95.5%). Differences observed between AI/AN and NHW decedents carried over by place where AI/AN tended to have a lower mean age and shorter age range than NHWs on RL and NTL. AI/AN decedents on RL reported the largest proportion in the lowest attainment level, “12th grade or less” at 33.7 percent, compared to 28.4 percent for NTL AI/AN and 18.7 percent for RL NHWs. Higher educational achievement was primarily observed for NHW decedents with RL NHWs showing the highest number of college degrees at 11.6 percent. No major differences were observed for homeless status between the groups by place, but migration differed in that the majority of AI/AN decedents on RL (73.0%) and NTL (68.4%) compared to NHWs (RL=47.2%, NTL=56.7%) had not migrated from their birth state, suggesting low geographical mobility. At the systems level, the only major difference observed was in presence of a law enforcement narrative. AI/AN decedents had lower law enforcement narrative presence (RL=78.8%, NTL=87.4%) compared to all NHWs (RL=91.9%, NTL=86.2%).

Legal Intervention (LI) Hypotheses Testing

Results from the chi-square test of independence and odds ratios (OR) for each select LI variable are reported in Table 10. A chi-square test of independence was performed to examine the relationship between race/ethnicity and primary LI weapon type (firearm), autopsy, toxicology, and presence of a law enforcement narrative. None of the tests met our significance level for reporting.

Exploratory Aim 2.a

The original intent of this aim was to determine whether a difference could be detected in missing (NA) or “unknown” response. A missingness analysis was not performed as the majority of the data included in the analysis is complete. It is important to note that some of the “completed” fields include text responses that equal “NA” and “unknown”, however, they are not clearly identifiable and thus could not be included with confidence in this analysis. Selected variables in aim 2 with categories equal to “NA” and “unknown” are reported in aim 2 tables if they were available. One visible example in this study is the percent of “unknown” listed as the weapon type for undetermined intent (UD) deaths. AI/AN had far lower poisoning deaths, the leading cause of UD, compared to whites with approximately 29 percent listed as “unknown” (NHW=9.2%). Greater disparities were observed for AI/AN decedents on RL where 32.1 percent had an “unknown” weapon type, indicating neither a manner of death or cause of death could be determined for a third of AI/AN victims.

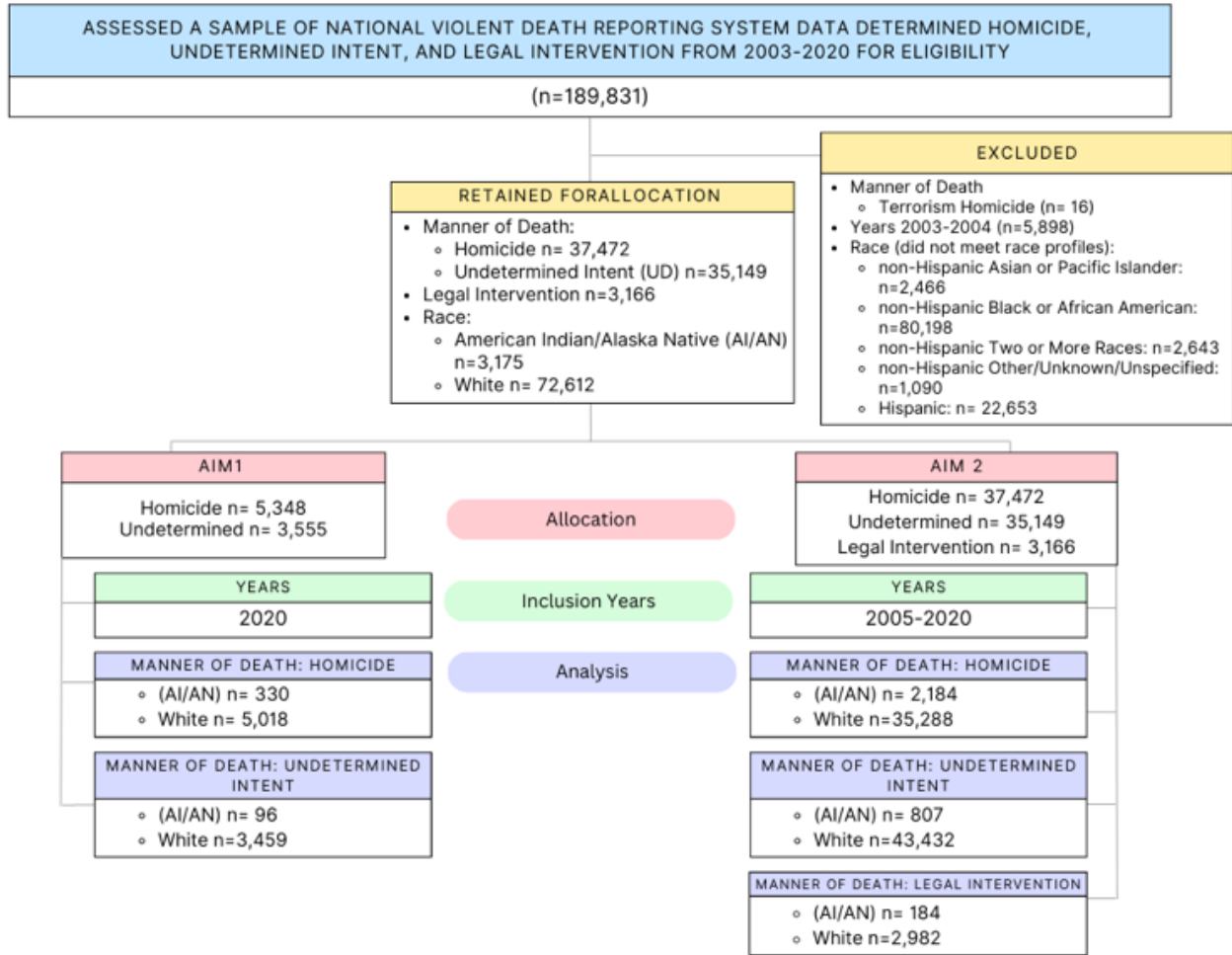
Figure 4. NVDRS Sample Consort Diagram

Table 4. (AIM 1) Homicide Rates in 2020 per 100,000 population by Race, and Place of Death (Reservation Lands vs. Non-Tribal Lands), Using the National Violent Deaths Reporting System.

Place			Total US				Non-Tribal Lands (NTL)				Reservation Lands (RL) ¹			
Data Type			Homicide Counts		Homicide Rates		Homicide Counts		Homicide Rates		Homicide Counts		Homicide Rates	
Race/Ethnicity			AI/AN ²	NHW ³	AI/AN	NHW	AI/AN	NHW	AI/AN	NHW	AI/AN	NHW	AI/AN	NHW
Total NHW population	Total pop AI/AN	Total pop NHW												
US	3727135	191697647	330	5,016	8.9	2.6	161	4,674	*	*	169	344	*	*
Alabama	33,625	3220452	0	153	0.0	4.8	0	151	0.0	*	0	-	0.0	-
Alaska	111575	435392	27	11	24.2	2.5	17	9	-	-	10	-	-	-
Arizona	319512	4322337	62	142	19.4	3.3	17	106	-	*	45	36	*	*
Arkansas	27177	2114512	0	133	0.0	6.3	0	125	0.0	*	0	8	0.0	-
California	631016	16296122	19	257	-	1.6	14	240	-	*	5	17	-	-
Colorado	74129	4082927	9	122	-	3.0	8	122	-	*	-	0	-	0.0
Connecticut	16051	2395128	0	31	0.0	1.3	0	30	0.0	*	0	-	0.0	-
Delaware	5148	597763	0	15	0.0	2.5	0	15	0.0	*	0	0	0.0	0.0
District of Columbia	3193	273194	0	-	0.0	-	0	-	0.0	-	0	0	0.0	0.0
Florida	94795	12422961	0	0	0.0	0.0	0	0	0.0	0.0	0	0	0.0	0.0
Georgia	50618	5555483	0	203	0.0	3.7	0	203	0.0	*	0	0	0.0	0.0
Hawaii	4370	333261	0	0	0.0	0.0	0	0	0.0	0.0	0	0	0.0	0.0
Idaho	25621	1510360	-	29	-	1.9	0	24	0.0	*	-	5	-	-
Illinois	96948	7868227	-	117	-	1.5	-	117	-	*	0	0	0.0	0.0
Indiana	26086	5241795	-	227	-	4.3	-	227	-	*	0	0	0.0	0.0
Iowa	14486	2694521	0	40	0.0	1.5	0	40	0.0	*	0	0	0.0	0.0
Kansas	30995	2222462	0	66	0.0	3.0	0	65	0.0	*	0	5	0.0	-
Kentucky	12801	3711254	0	202	0.0	5.4	0	202	0.0	*	0	0	0.0	0.0
Louisiana	31657	2657652	0	135	0.0	5.1	0	130	0.0	*	0	5	0.0	-
Maine	7885	1237041	0	18	0.0	1.5	0	16	0.0	*	0	-	0.0	-
Maryland	31845	3007874	-	75	-	2.5	-	75	-	*	0	0	0.0	0.0
Massachusetts	24018	4896037	0	45	0.0	0.9	0	45	0.0	*	0	0	0.0	0.0
Michigan	61261	7444974	-	154	-	2.1	-	147	-	*	-	7	-	-
Minnesota	68641	4423146	13	58	-	1.3	6	51	-	*	7	7	-	-
Mississippi	16450	1658893	-	104	-	6.3	-	102	-	*	-	-	-	-

Missouri	30518	4740335	-	230	-	4.9	-	228	-	*	0	-	-	-
Montana	67612	916524	20	38	29.6	4.1	-	32	-	*	17	6	-	-
Nebraska	23102	1538052	-	32	-	2.1	-	30	-	*	-	-	-	-
Nevada	43932	1588463	-	76	-	4.8	-	50	-	*	-	26	-	*
New Hampshire	3031	1216203	0	15	0.0	1.2	0	15	0.0	-	0	0	0.0	0.0
New Jersey	51186	5112280	0	35	0.0	0.7	0	35	0.0	*	0	0	0.0	0.0
New Mexico	212241	1078937	33	47	15.6	4.4	16	34	-	*	17	13	-	-
New York	149690	11143349	-	130	-	1.2	-	127	-	*	0	-	0.0	-
North Carolina	130032	6488459	25	225	19.2	3.5	24	222	*	*	-	-	-	-
North Dakota	38914	645938	7	16	-	2.5	-	14	-	-	-	-	-	-
Ohio	30720	9080688	-	251	-	2.8	-	251	-	*	0	0	0.0	0.0
Oklahoma	332791	2514885	30	157	9.0	6.2	6	37	-	*	24	120	*	*
Oregon	62993	3169096	5	82	-	2.6	-	68	-	*	-	14	-	-
Pennsylvania	31052	9750687	-	170	-	1.7	-	170	-	*	0	0	0.0	0.0
Puerto Rico	17870	560,592	0	15	0.0	2.7	0	15	0.0	-	0	0	0.0	0.0
Rhode Island	7385	782920	-	11	-	1.4	-	11	-	-	0	0	0.0	0.0
South Carolina	24303	3243442	0	169	0.0	5.2	0	166	0.0	*	0	-	0.0	-
South Dakota	77748	715336	28	16	36.0	2.2	14	16	-	-	14	0	-	0.0
Tennessee	28044	4990938	-	209	-	4.2	-	209	-	*	0	0	0.0	0.0
Texas	278948	14609365	-	200	-	1.4	-	200	-	*	0	0	0.0	0.0
Utah	41644	2573413	-	51	-	2.0	-	45	-	*	-	6	-	*
Vermont	2289	577751	-	10	-	1.7	-	10	-	-	0	0	0.0	0.0
Virginia	40007	5208856	-	137	-	2.6	-	137	-	*	0	0	0.0	0.0
Washington	121468	5130920	13	144	-	2.8	-	118	-	*	9	26	-	*
West Virginia	3706	1610749	0	105	0.0	6.5	0	105	0.0	*	0	0	0.0	0.0
Wisconsin	60428	4737545	0	94	0.0	2.0	0	74	0.0	*	0	20	0.0	*
-Wyoming	13898	488374	5	12	-	2.5	-	9	-	-	-	-	-	-

Data.census.gov 2020 data Accessed March 2, 2023

Abbreviations: *AI/AN* American Indian/Alaska Native, *NHW* non-Hispanic White, *RL* Reservation and associated Trust Lands, *NTL* Non-Tribal and associate trust Lands, *SD* standard deviation.

Note:

Dashes “-” are displayed for cells where frequencies less than 5 and where cells under n=20 were prohibited from rate calculations following the CDC policy.

Asterisks “*” are displayed for cells where frequencies meet cell size requirements but population data pertaining to the denominator for RL and NTL distinction were not available.

¹ This category includes decedents who were identified within zip code tabulation areas identified as overlapping Reservation or trust lands (RL) identified in the USEPA tribal lands table.

² American Indian/Alaska Native is defined as Person with origins among any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition (includes Alaska Natives).

³ non-Hispanic white (NHW) is defined as Person with origins among any of the original peoples of Europe, North Africa, or the Middle East with no Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin (Ethnicity).

18 states reported incidents of homicide for both AI/AN and NHW on RL and NTL for 2020 (Alaska, Arizona, California, Idaho, Michigan, Minnesota, Mississippi, Montana, Nebraska, Nevada, New Mexico, North Carolina, North Dakota, Oklahoma, Oregon, Utah, Washington, and Wyoming)

Table 5. (AIM 1) Undetermined (UD) Rates in 2020 per 100,000 population by State, Race, and Place of Injury (Reservation Lands vs. Non-Tribal Lands), Using the National Violent Deaths Reporting System.

Place			Total US				Non-Tribal Lands (NTL)				Reservation Lands (RL) ¹			
Data Type			UD Counts		UD Rates		UD Counts		UD Rates		UD Counts		UD Rates	
Race/Ethnicity			AI/AN ²	NHW ³	AI/AN	NHW	AI/AN	NHW	AI/AN	NHW	AI/AN	NHW	AI/AN	NHW
Total NHW population	Total pop AI/AN	Total pop NHW												
US	3727135	191697647	96	3,459	2.6	1.8	56	3,317	*	*	40	109	*	*
Alabama	33,625	3220452	0	27	0.0	0.8	0	26	0.0	*	0	-	0.0	-
Alaska	111575	435392	14	19	-	-	-	16	-	-	6	-	-	-
Arizona	319512	4322337	22	108	6.9	2.5	7	70	-	*	15	38	-	*
Arkansas	27177	2114512	0	47	0.0	2.2	0	46	0.0	*	0	-	0.0	-
California	631016	16296122	-	51	-	0.3	-	46	-	*	-	5	-	*
Colorado	74129	4082927	-	34	-	0.8	-	32	-	*	-	-	-	-
Connecticut	16051	2395128	0	6	0.0	-	0	6	0.0	-	0	0	0.0	0.0
Delaware	5148	597763	0	5	0.0	-	0	5	0.0	-	0	0	0.0	0.0
District of Columbia	3193	273194	0	-	0.0	-	0	-	0.0	-	0	0	0.0	0.0
Florida	94795	12422961	0	0	0.0	0.0	0	0	0.0	0.0	0	0	0.0	0.0
Georgia	50618	5555483	0	40	0.0	0.7	0	40	0.0	*	0	0	0.0	0.0
Hawaii	4370	333261	0	0	0.0	0.0	0	0	0.0	0.0	0	0	0.0	0.0
Idaho	25621	1510360	0	12	0.0	-	0	9	0.0	-	0	-	0.0	-
Illinois	96948	7868227	0	56	0.0	0.7	0	56	0.0	*	0	0	0.0	0.0
Indiana	26086	5241795	-	116	-	2.2	-	116	-	*	0	0	0.0	0.0
Iowa	14486	2694521	0	36	0.0	1.3	0	36	0.0	*	0	0	0.0	0.0
Kansas	30995	2222462	-	18	-	-	-	18	-	-	0	0	0.0	0.0
Kentucky	12801	3711254	0	57	0.0	1.5	-	57	0.0	*	0	0	0.0	0.0
Louisiana	31657	2657652	-	77	-	2.9	-	77	-	*	0	0	0.0	0.0
Maine	7885	1237041	-	29	-	2.3	-	28	-	*	0	-	0.0	-
Maryland	31845	3007874	-	1059	18.8	35.2	6	1059	-	*	0	0	0.0	0.0
Massachusetts	24018	4896037	0	56	0.0	1.1	0	56	0.0	*	0	0	0.0	0.0
Michigan	61261	7444974	-	406	-	5.5	-	404	0.0	*	0	-	0.0	-
--Minnesota	68641	4423146	-	28	-	0.6	-	24	-	*	0	-	0.0	-
Mississippi	16450	1658893	0	-	0.0	-	-	4	-	-	0	0	0.0	0.0
Missouri	30518	4740335	-	69	-	1.5	-	68	-	*	0	-	0.0	-
Montana	67612	916524	-	14	-	-	-	13	-	-	5	-	-	-
Nebraska	23102	1538052	-	14	-	-	-	12	-	-	0	-	0.0	-
Nevada	43932	1588463	-	36	-	2.3	-	21	-	*	-	15	-	-

New Hampshire	3031	1216203	0	7	0.0	-	0	7	0.0	-	0	0	0.0	0.0
New Jersey	51186	5112280	0	27	0.0	0.5	0	27	0.0	*	0	0	0.0	0.0
New Mexico	212241	1078937	-	11	-	-	6	7	-	-	7	-	-	-
New York	149690	11143349	-	285	-	2.6	-	279	0.0	*	0	6	0.0	*
North Carolina	130032	6488459	-	46	-	0.7	-	46	-	*	0	0	0.0	0.0
North Dakota	38914	645938	0	5	0.0	-	0	4	0.0	-	0	-	0.0	-
Ohio	30720	9080688	0	87	0.0	1.0	0	87	0.0	*	0	0	0.0	0.0
Oklahoma	332791	2514885	0	23	0.0	0.9	0	13	0.0	-	0	10	0.0	-
Oregon	62993	3169096	-	49	-	1.5	-	46	-	*	0	-	0.0	-
Pennsylvania	31052	9750687	0	95	0.0	1.0	0	95	0.0	*	0	0	0.0	0.0
Puerto Rico	17870	560,592	0	-	0.0	-	0	2	0.0	-	0	0	0.0	0.0
Rhode Island	7385	782920	0	13	0.0	1.7	0	13	0.0	-	0	0	0.0	0.0
South Carolina	24303	3243442	-	23	-	0.7	-	22	-	*	0	-	0.0	-
South Dakota	77748	715336	-	-	-	-	0	-	0.0	-	-	0	-	0.0
Tennessee	28044	4990938	0	102	0.0	2.0	0	102	0.0	*	0	0	0.0	0.0
Texas	278948	14609365	0	29	0.0	0.2	0	29	0.0	*	0	0	0.0	0.0
Utah	41644	2573413	0	44	0.0	1.7	0	39	0.0	*	0	5	0.0	-
Vermont	2289	577751	-	15	-	-	-	15	-	-	0	0	0.0	0.0
Virginia	40007	5208856	0	21	0.0	0.4	0	21	0.0	*	0	0	0.0	0.0
Washington	121468	5130920	-	76	-	1.5	-	59	-	*	-	0	-	0.0
West Virginia	3706	1610749	0	21	0.0	1.3	0	21	0.0	*	0	0	0.0	0.0
Wisconsin	60428	4737545	0	33	0.0	0.7	0	32	0.0	*	0	0	0.0	0.0
Wyoming	13898	488374	0	21	0.0	-	0.0	-	0.0	0.0	0	-	0.0	-

Data.census.gov 2020 data Accessed March 2, 2023

Abbreviations: *UD* undetermined intent, *AI/AN* American Indian/Alaska Native, *NHW* non-Hispanic White, *RL* Reservation and associated Trust Lands, *NTL* Non-Tribal and associate trust Lands, *SD* standard deviation.

Notes:

Dashes “-” are displayed for cells where frequencies less than 5 and where cells under n=20 were prohibited from rate calculations following the CDC policy.

Asterisks “*” are displayed for cells where frequencies meet cell size requirements but population data pertaining to the denominator for RL and NTL distinction were not available.

¹ This category includes decedents who were identified within zip code tabulation areas identified as overlapping Reservation or trust lands (RL) identified in the USEPA tribal lands table.

² American Indian/Alaska Native is defined as Person with origins among any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition (includes Alaska Natives).

³ non-Hispanic white (NHW) is defined as Person with origins among any of the original peoples of Europe, North Africa, or the Middle East with no Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin (Ethnicity).

7 states reported UD incidents for both AI/AN and NHW on RL and NTL (Alaska, Arizona, California, Colorado, Montana, New Mexico, and Washington)

Table 6. AI/AN and NHW Homicide Rates per 100,000 Population by IHS Region and RL/NTL

REGION	Total AI/AN ²	Total NHW ³	RL ¹ AI/AN	NTL AI/AN	RL NHW	NTL NHW
R1 Alaska	24.2	2.5	-	-	*	*
R2 Albuquerque	7.6	1.9	-	*	*	*
R3 Bemidji	-	2.2	-	-	*	*
R4 Billings	30.7	3.6	*	-	*	*
R5 California	-	1.5	-	-	*	*
R6 Great Plains	24.6	1.9	-	*	*	*
R7 Nashville	4.4	2.6	-	*	*	*
R8 Navajo	17.0	3.2	*	*	*	*
R9 Oklahoma	9.0	6.2	*	-	*	*
R10 Portland	9.5	2.6	-	-	*	*

Abbreviations: *AI/AN* American Indian/Alaska Native, *NHW* non-Hispanic White, *RL* Reservation and associated Trust Lands, *NTL* Non-Tribal and associated trust Lands, *SD* standard deviation.

Notes:

Dashes “—” are displayed for cells where frequencies less than 5 and where cells under n=20 were prohibited from rate calculations following the CDC policy.

Asterisks “*” are displayed for cells where frequencies meet cell size requirements but population data pertaining to the denominator for RL and NTL distinction were not available.

¹ This category includes decedents who were identified within zip code tabulation areas identified as overlapping Reservation or trust lands (RL) identified in the USEPA tribal lands table.

² American Indian/Alaska Native is defined as Person with origins among any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition (includes Alaska Natives).

³ non-Hispanic white (NHW) is defined as Person with origins among any of the original peoples of Europe, North Africa, or the Middle East with no Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin (Ethnicity).

Table 7. AI/AN and NHW UD Rates per 100,000 Population by IHS Region and RL/NTL

REGION	Total AI/AN ²	Total NHW ³	RL ¹ AI/AN	NTL AI/AN	RL NHW	NTL NHW
R1 Alaska	-	-	-	-	-	-
R2 Albuquerque	-	0.4	-	-	-	*
R3 Bemidji	-	2.2	-	-	-	*
R4 Billings	-	-	-	-	-	-
R5 California	-	0.3	-	-	-	*
R6 Great Plains	-	1.1	-	-	-	*
R7 Nashville	-	2.0	-	-	-	*
R8 Navajo	5.7	2.2	4.0	*	*	*
R9 Oklahoma	0.0	-	0.0	-	-	-
R10 Portland	3.3	1.4	-	-	*	*

Abbreviations: *UD* undetermined intent, *AI/AN* American Indian/Alaska Native, *NHW* non-Hispanic White, *RL* Reservation and associated Trust Lands, *NTL* Non-Tribal and associate trust Lands, *SD* standard deviation.

Note: Dashes “-” are displayed for cells where frequencies less than 5 and where cells under n=20 were prohibited from rate calculations following the CDC policy.

¹ This category includes decedents who were identified within zip code tabulation areas identified as overlapping Reservation or trust lands (RL) identified in the USEPA tribal lands table.

² American Indian/Alaska Native is defined as Person with origins among any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition (includes Alaska Natives).

³ non-Hispanic white (NHW) is defined as Person with origins among any of the original peoples of Europe, North Africa, or the Middle East with no Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin (Ethnicity).

Table 8. (Aim 2) Multilevel Descriptive characteristics of Homicide study population, by total sample and Place (Reservation Lands vs. Non-Tribal Lands, National Violent Deaths Reporting System, 2005-2020.

			Pearson's Chi-square ³ by Race/Ethnicity		Place of Death			
Race/Ethnicity	Total AI/AN ¹	Total NHW ²	χ^2, p value	OR [†] 95% CI	AI/AN		NHW	
Injury location					Reservation Lands ⁴	Non-Tribal Lands	Reservation Lands ⁴	Non-Tribal Lands
Number of homicides, n (%)	2,184 (100.0)	35,288(100.0)			1,059 (48.5)	1,125 (51.5)	2,508 (7.1)	32,780 (92.9)
<i>Individual and Social Level Characteristics</i>								
Mean age (SD)	34.1 (15.7)	41.2 (19.8)			33.8 (15.9)	34.4 (15.5)	41.0 (19.6)	41.2 (19.8)
Age range	0-93	0-101			0-93	0-85	0-96	0-101
Age group, n (%)								
child 0-17	235 (10.8)	3,540 (10.0)			123 (11.6)	112 (10.0)	268 (10.7)	3,272 (10.0)
adult 18-54	1,739 (79.6)	23,408 (66.3)			838 (79.1)	901 (80.1)	1,638 (65.3)	21,770 (66.4)
senior 55+	210 (9.6)	8,299 (23.5)			98 (9.3)	112 (10.0)	601 (24.0)	7,698 (23.5)
NA	-	41 (0.1)			-	-	-	40 (0.1)
Sex, n (%)								
Female	530 (24.3)	12,331 (34.9)			253 (23.9)	277 (24.6)	804 (32.1)	11,527 (35.2)
Male	1,654 (75.7)	22,956 (65.1)			806 (76.1)	848 (75.4)	1,704 (67.9)	21,252 (64.8)
Unknown	0	-			0	0	0	-
Education Level, n (%)								
12 th grade or less, no diploma	785 (36.0)	8,596 (24.4)			439 (41.4)	346 (30.8)	704 (28.1)	7,892 (24.1)
High school graduate, GED, or some college	980 (44.9)	15,775 (44.6)			506 (47.8)	474 (42.1)	1,336 (53.3)	14,439 (44.0)
College Degree	105 (4.9)	4,372 (12.4)			52 (4.9)	53 (4.7)	337 (13.4)	4,035 (12.3)
Unknown	289 (13.2)	6,010 (17.0)			36 (3.3)	230 (20.4)	127 (5.1)	5,883 (17.9)
NA	25 (1.1)	535 (1.5)			26 (2.5)	22 (1.9)	-	531 (1.6)
Homeless Status, n (%)								
Yes	110 (5.0)	849 (2.4)			29 (2.7)	81 (7.2)	75 (3.0)	774 (2.4)
No	1876 (85.9)	31,649 (89.7)			938 (88.6)	938 (83.4)	2,310 (92.1)	29,339 (89.5)
Unknown	136 (6.2)	1,407 (4.0)			76 (7.2)	60 (5.3)	68 (2.7)	1,339 (4.1)

NA	62 (2.8)	1,383 (3.9)			16 (1.5)	46 (4.1)	55 (2.2)	1,328 (4.1)
Migration, n (%)								
Yes	495 (22.7)	14,147 (40.0)			212 (20.0)	283 (25.2)	1,234 (49.2)	12,913 (39.4)
No	1,678 (76.8)	20,917 (59.3)			844 (79.7)	834 (74.1)	1,266 (50.5)	19,651 (59.9)
NA	11 (0.5)	224 (0.6)			-	8 (0.7)	8 (0.3)	216 (0.7)
<i>Incident Level Characteristics</i>								
Single homicide	1945 (89.1)	28,120 (79.7)			948 (89.5)	997 (88.6)	1,965 (78.3)	26,155 (79.8)
Multiple homicide	151 (6.9)	3,058 (8.7)			65 (6.1)	86 (7.6)	244 (9.7)	2,814 (8.6)
Single homicide followed by suicide	57 (2.6)	2,747 (7.8)			29 (2.7)	28 (2.5)	188 (7.5)	2,559 (7.8)
Multiple deaths – homicide followed by suicide/legal intervention, mutual shootout, or other	31 (1.4)	1,363 (3.9)			17 (1.4)	14 (1.3)	111 (4.4)	1,252 (3.8)
Weapon Type, n (%)								
Blunt instrument	199 (9.1)	3,001 (8.5)	$\chi^2 69.06$ $p < .001^{**}$	OR 1.44 (CI 1.32, 1.57)	114 (10.8)	85 (7.6)	221 (8.8)	2,780 (8.5)
Firearm [§]	1030 (47.6)	19,784 (56.1)			407 (38.4)	623 (55.4)	1,444 (57.6)	18,340 (55.9)
Hanging, strangulation, suffocation	64 (2.9)	1,752 (5.0)			35 (3.3)	29 (2.6)	96 (3.8)	1,656 (5.1)
Motor vehicle, bus, motorcycle	38 (1.7)	477 (1.4)			21 (2.0)	17 (1.5)	28 (1.1)	449 (1.4)
Personal weapons	210 (9.6)	2,284 (6.5)			109 (10.3)	101 (8.9)	159 (6.3)	2,125 (6.5)
Sharp instrument	482 (22.0)	5,202 (14.7)			285 (26.9)	197 (17.5)	376 (15.0)	4,826 (14.7)
All Other ⁵	71 (3.3)	1,453 (4.1)			43 (4.1)	28 (2.5)	92 (3.7)	1,361 (4.2)
Unknown	63 (2.9)	819 (2.3)			36 (3.4)	27 (2.4)	64 (2.6)	755 (2.3)
NA	27 (1.2)	516 (1.5)			9 (0.8)	18 (1.6)	28 (1.1)	488 (1.5)
<i>System Level</i>								
Autopsy Performed, n (%)								
Autopsied (full or partial) [§]	2124 (97.3)	34,058 (96.5)	$\chi^2 5.42$ $p = 0.02$	OR 0.71 (CI 0.53, 0.95)	1,027 (97.0)	1,097 (97.5)	2,416 (96.3)	31,642 (96.5)

Not autopsied	46 (2.1)	960 (2.7)			21 (2.0)	25 (2.2)	86 (3.4)	873 (2.7)
Unknown	5 (0.2)	184 (0.5)			-	-	-	182 (0.6)
NA	9 (0.4)	86 (0.2)			7 (0.7)	-	-	83 (0.3)
Toxicology, n (%)								
Yes	1994 (91.3)	30,187 (85.5)			973 (91.9)	1021 (90.8)	2,310 (92.1)	27,877 (85.0)
No [§]	190 (8.7)	5,101 (14.6)	$\chi^2 56.19$ $p < .001$	OR 1.77 (CI 1.52, 2.07)	86 (8.1)	104 (9.2)	198 (7.9)	4,903 (15.0)
Law Enforcement Narrative								
Yes	1,633 (74.8)	30,632 (86.8)			720 (68.0)	913 (81.2)	2,104 (83.9)	25,309 (77.2)
No [§]	551 (25.2)	4,656 (13.2)	$\chi^2 248.96$ $p < .001$	OR 0.45 (CI 0.41, 0.50)	339 (32.0)	212 (18.8)	209 (8.3.0)	4,447 (13.6)

Abbreviations: *AI/AN* American Indian/Alaska Native, *NHW* non-Hispanic White, *RL* Reservation and associated Trust Lands, *NTL* Non-Tribal and associate trust Lands, *SD* standard deviation.

Column percentages are calculated and may not total 100% due to rounding.

Note: Dashes “-” are displayed for cells with less than 5 counts following the CDC cell size suppression policy.

[†] Odds ratios measure the association between the decedent having the weapon type, or system level characteristic and the race of the decedent being NHW. Each adjusted odds ratio used AI/AN as the reference group. No Odds ratios were run by place (RL/NTL).

[§] Chi-squared test result for difference between AI/AN and white significant at $p < 0.05$.

¹ American Indian/Alaska Native (AI/AN) is defined as Person with origins among any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition (includes Alaska Natives).

² non-Hispanic white (NHW) is defined as Person with origins among any of the original peoples of Europe, North Africa, or the Middle East with no Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin (Ethnicity).

³ This category includes decedents who were identified within zip code tabulation areas identified as overlapping Reservation or trust lands (RL) identified in the USEPA tribal lands table.

⁴ We performed a Pearson’s chi-square test in independence on weapon type, and system level variables to compare American Indian/Alaska Natives (referent group) to Non-Hispanic White decedents.

⁵ All Other includes: Other weapon includes biological weapons, intentional neglect, non-powder gun, other transport vehicle, personal weapons, shaking, sharp instrument, and other (e.g., taser, electrocution, nail gun).

Table 9. (Aim 2) Multilevel Descriptive characteristics of Undetermined Intent study population, by total sample and Place (Reservation Lands vs. Non-Tribal Lands, National Violent Deaths Reporting System, 2005-2020.

Race/Ethnicity	Total AI/AN ¹	Total NHW ²	Pearson's Chi-square ³ by Race/Ethnicity		Place of Death			
			χ^2, ρ value	OR [†] 95% CI	AI/AN		NHW	
Injury Location					Reservation Lands ⁴	Non-Tribal Lands	Reservation Lands ⁴	Non-Tribal Lands
Number of Undetermined, n (%)	807 (100.0)	34,342 (100.0)			393 (48.7)	414 (51.3)	1,606 (4.7)	32,736 (95.3)
<i>Individual and Social Level Characteristics</i>								
Mean age (SD)	36.8 (18.9)	42.5 (16.8)			36.1 (20.8)	37.6 (16.8)	41.2 (20.4)	42.5 (16.6)
Age range	0-93	0-100			0-93	0-83	0-99	0-100
Age group, n (%)								
child 0-17	121 (15.0)	1,804 (5.3)			77 (19.6)	44 (10.6)	205 (12.8)	1,599 (4.9)
adult 18-54	558 (69.1)	25,435 (74.1)			243 (61.8)	315 (76.1)	1,002 (62.4)	24,433 (74.6)
senior 55+	127 (15.7)	7,050 (20.5)			73 (18.6)	54 (13.0)	397 (24.7)	6,653 (20.3)
unknown	1 (0.1)	-			-	-	-	-
NA	72 (8.9)	53 (0.2)			-	29 (7.0)	-	51 (0.1)
Sex, n (%)								
Female	291 (36.1)	12,961 (37.7)			148 (37.7)	143 (34.5)	687 (42.8)	12,274 (37.5)
Male	516 (63.9)	21,381 (62.3)			245 (62.3)	271 (65.5)	919 (57.2)	20,462 (62.5)
Education Level, n (%)								
12 th grade or less, no diploma	270 (33.5)	6,697 (19.5)			143 (34.3)	127 (30.7)	449 (28.0)	6,248 (19.1)
High school graduate, GED, or some college	379 (47.0)	17,166 (50.0)			182 (46.3)	197 (47.6)	802 (49.9)	16,355 (50.0)
College Degree	28 (3.4)	4,286 (12.5)			14 (3.6)	14 (3.4)	241 (15.0)	4,045 (12.4)
Unknown	129 (16.0)	5,857 (13.7)			54 (13.7)	75 (18.1)	112 (7.0)	5,745 (17.5)

NA	-	336 (1.0)	-	-	-	334 (1.0)
Homeless Status, n (%)						
Yes	38 (4.7)	1,125 (3.3)	13 (3.3)	35 (8.5)	37 (2.3)	1,088 (3.3)
No	686 (85.0)	31,176 (90.1)	354 (90.1)	332 (80.0)	1,529 (95.2)	29,647 (90.6)
Unknown	47 (5.8)	1,014 (5.9)	23 (5.9)	24 (5.8)	21 (1.3)	993 (3.0)
NA	36 (4.5)	1,027 (0.8)	-	23 (5.5)	19 (1.2)	1,008 (3.1)
Migration, n (%)						
Yes	223 (27.6)	12,711 (37.0)	84 (21.4)	139 (33.6)	848 (52.8)	11,863 (36.2)
No	583 (72.2)	21,388 (62.3)	308 (78.4)	275 (66.4)	758 (47.2)	20,630 (63.0)
NA		243 (0.7)				243 (0.7)
<i>Incident Level Characteristics</i>						
Incident Category, n (%)						
Single death of undetermined intent	796 (98.6)	33,976 (98.9)	387 (98.5)	409 (98.8)	1,581 (98.4)	32,395 (99.0)
Other	11 (1.4)	366 (1.0)	6 (1.5)	5 (1.2)	25 (1.6)	341 (1.0)
Weapon Type, n (%)						
Blunt instrument	58 (7.2)	656 (1.9)	25 (6.4)	33 (8.0)	27 (1.7)	629 (1.9)
Drowning	56 (6.9)	1046 (3.0)	28 (7.2)	28 (6.8)	59 (3.7)	987 (3.0)
Fall	27 (3.3)	806 (2.3)	15 (3.8)	12 (3.0)	43 (2.7)	763 (2.3)
Fire or burns	36 (4.5)	556 (1.6)	22 (5.6)	14 (3.4)	42 (2.6)	514 (1.6)
Firearm	52 (6.4)	1064 (3.1)	27 (6.9)	25 (6.0)	83 (5.2)	981 (3.0)
Hanging, strangulation, suffocation	27 (3.3)	598 (1.7)	14 (3.6)	13 (3.1)	50 (3.1)	548 (1.7)
Motor vehicle, bus, motorcycle	33 (4.1)	425 (1.2)	16 (1.5)	17 (4.1)	35 (2.2)	390 (1.2)
Personal Weapons	18 (2.2)	109 (0.3)	13 (3.3)		7 (0.4)	102 (0.3)
Poisoning [§]	210 (26.0)	24,562 (71.5)	76 (19.3)	134 (32.4)	856 (53.3)	23,706 (72.4)
Unknown	237 (29.4)	3,172 (9.2)	126 (32.1)	111 (26.8)	344 (21.4)	2,828 (8.6)
NA	8 (0.1)	488 (1.4)	-	-	21 (1.3)	467 (1.4)

$\chi^2 819.85$
 $p < .001$
 OR 7.41
 (CI 6.31, 8.74)

All Other ⁵	45 (5.6)	860 (2.5)			27 96.9)	23 (5.5)	39 (2.4)	821 (2.5)
<i>System Level</i>								
Autopsy Performed, n (%)								
Autopsied (full or partial)	660 (81.8)	28,808 (83.9)	$\chi^2 3.14$ $p = .077$	OR 0.08 (CI 0.98, 1.42)	325 (82.7)	335 (80.9)	1,182 (73.6)	27,626 (84.4)
Not autopsied	139 (17.2)	5,299 (15.4)			62 (15.8)	77 (18.6)	417 (26.0)	4,882 (14.9)
Unknown	7 (0.9)	110 (0.3)			6 (1.5)	-	6 (0.4)	104 (0.3)
NA		125 (0.4)					-	124 (0.4)
Toxicology, n (%)								
Yes	715 (88.6)	31,991 (93.2)			351 (89.3)	364 (87.9)	1,528 (95.1)	30,463 (93.1)
No [§]	92 (11.4)	2,351 (10.7)	$\chi^2 25.29$ $p < .001$	OR 0.57 (CI 0.46, 0.72)	42 (10.7)	50 (12.1)	78 (4.9)	2,273 (6.9)
Law Enforcement Narrative, n (%)								
Yes	598 (74.1)	26,183 (76.2)			290 (73.8)	314 (75.8)	1,418 (88.3)	24,812 (75.8)
NA [§]	171 (21.2)	5,695 (16.6)	$\chi^2 12.03$ $p < .001$	OR 0.74 (CI 0.62, 0.88)	92 (23.4)	79 (19.1)	145 (9.0)	5,550 (17.0)

Abbreviations: *AI/AN* American Indian/Alaska Native, *NHW* non-Hispanic White, *RL* Reservation and associated Trust Lands, *NTL* Non-Tribal and associate trust Lands, *SD* standard deviation.

Column percentages are calculated and may not total 100% due to rounding.

Note: Dashes “-” are displayed for cells with less than 5 counts following the CDC cell size suppression policy.

[†] Odds ratios measure the association between the decedent having the weapon type, or system level characteristic and the race of the decedent being NHW. Each adjusted odds ratio used AI/AN as the reference group.

[§] Chi-squared test result for difference between AI/AN and white significant at $p < 0.05$.

¹ American Indian/Alaska Native (AI/AN) is defined as Person with origins among any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition (includes Alaska Natives).

² non-Hispanic white (NHW) is defined as Person with origins among any of the original peoples of Europe, North Africa, or the Middle East with no Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin (Ethnicity).

³ This category includes decedents who were identified within zip code tabulation areas identified as overlapping Reservation or trust lands (RL) identified in the USEPA tribal lands table.

⁴ We performed a Pearson's chi-square test in independence on weapon type, and system level variables to compare American Indian/Alaska Natives (referent group) to Non-Hispanic White decedents.

⁵ All Other includes: Other weapon includes biological weapons, intentional neglect, non-powder gun, other transport vehicle, personal weapons, shaking, sharp instrument, and other (e.g., taser, electrocution, nail gun).

Table 10. (AIM 2) RAW Multilevel Descriptive characteristics of Legal Intervention study population, by total sample and Place (Reservation Lands vs. Non-Tribal Lands, National Violent Deaths Reporting System, 2005-2020.

Race/Ethnicity	Total AI/AN ¹	Total NHW ²	Pearson's Chi-square ³ by Race/Ethnicity		Place of Death			
			χ^2, ρ value	OR [†] 95% CI	AI/AN		NHW	
Injury Location					Reservation Lands ⁴	Non-Tribal Lands	Reservation Lands ⁴	Non-Tribal Lands
Legal Intervention deaths, n (%)	184 (100)	2,982 (100)			89 (48.4)	95 (51.6)	284 (9.5)	2,698 (90.5)
<i>Individual and Social Level Characteristics</i>								
Mean age (SD), years	34.8 (10.6)	40.6 (13.5)			34.9 (10.0)	34.7 (11.1)	40.2 (13.7)	40.5 (13.5)
Age Range	14-67	12-91			14-67	17-65	12-83	13-91
Sex, n (%)								
Female	9 (4.9)	157 (5.3)			3 (3.4)	6 (6.3)	16 (5.6)	141 (5.2)
Male	175 (95.1)	2,825 (94.7)			86 (96.6)	89 (93.7)	268 (94.4)	2557 (94.8)
Education Level, n (%)								
12 th grade or less, no diploma	57 (31.0)	545 (18.3)			30 (33.7)	27 (28.4)	53 (18.7)	492 (18.2)
High school graduate, GED, or some college	109 (59.2)	1,616 (54.2)			48 (53.9)	61 (64.2)	184 (64.8)	1,432 (53.1)
College Degree	9 (4.9)	339 (11.4)			8 (9.0)	-	33 (11.6)	306 (11.3)
Unknown	9 (4.9)	458 (15.4)			-	6 (6.3)	14 (4.9)	444(16.5)
NA	0 (0)	24 (0.8)			0 (0)	0 (0)	0 (0)	24 (0.9)
Homeless Status, n (%)								

Yes	7 (2.8)	103 (3.5)			-	6 (6.3)	8 (2.8)	95 (3.5)
No	15 (8.2)	2,642 (88.6)			79 (88.8)	81 (85.3)	254 (89.4)	2,388 (88.5)
Unknown	160 (87.0)	175 (5.9)			8 (9.0)	7 (7.4)	15 (5.3)	160 (5.9)
NA	-	62 (2.1)			-	-	7 (2.5)	55 (2.0)
Migration, n (%)								
Yes	54 (29.3)	1,307 (43.8)			24 (27.0)	30 (31.6)	150 (52.8)	1,157 (42.9)
No	130 (70.7)	1,664 (55.8)			65 (73.0)	65 (68.4)	134 (47.2)	1,531 (56.7)
NA	0 (0)	11 (0.4)			0 (0)	0 (0)	-	10 (0.4)
<i>Incident Level Characteristics</i>								
Incident Category, n (%)								
Single legal intervention death	178 (96.7)	2,826 (94.8)			86 (96.6)	92 (96.8)	267 (94.0)	2,559 (94.8)
Other LI	6 (3.3)	156 (5.2)			-	-	17 (6.0)	139 (5.2)
Weapon Type, n (%)								
Firearm	174 (94.6)	2,741 (91.9)	$\chi^2 0.83$ p= 0.38	OR 0.74 (CI 0.62, 0.88)	85 (95.5)	89 (93.7)	257 (90.5)	2,484 (92.1)
Other ⁵	10 (5.4)	213 (7.1)			-	6 (6.3)	27 (9.5)	191 (7.1)
NA	0 (0)	28 (0.9)			0 (0)	0 (0)	5 (1.8)	23 (0.9)
<i>System Level</i>								
Autopsy Performed, n (%)								
Autopsied (full or partial)	181 (98.4)	2,919 (97.9)	$\chi^2 12.03$ p= .38	OR 0.74 (CI 0.34, 1.42)	87 (97.8)	94 (98.9)	272 (95.8)	2,647 (98.1)
Not autopsied	-	53 (1.8)			-	-	11 (3.9)	43 (1.8)
Unknown	0 (0)	5 (0.2)			0 (0)	0 (0)	0 (0)	5 (0.2)
NA	0 (0)	5 (0.2)			0 (0)	0 (0)	-	-
Toxicology, n (%)								
Yes	175 (95.1)	2,723 (91.3)			82 (92.1)	93 (97.9)	274 (96.5)	2,548

No	9 (4.9)	259 (8.7)	$\chi^2 0.09$ p= .79	OR 0.83 (CI 0.17, 2.60)	7 (7.9)	-	10 (3.5)	(94.4) 250 (9.3)
Law Enforcement Narrative, n (%)								
Yes	153 (83.2)	2,532 (84.9)			70 (78.8)	83 (87.4)	261 (91.9)	2,325 (86.2)
No	30 (16.3)	396 (13.3)	$\chi^2 3.21$ p= 0.07	OR 1.85 (CI 0.94, 4.16)	19 (21.3)	11 (11.6)	23 (8.1)	373 (13.8)

Abbreviations: *AI/AN* American Indian/Alaska Native, *NHW* non-Hispanic White, *RL* Reservation and associated Trust Lands, *NTL* Non-Tribal and associate trust Lands, *SD* standard deviation.

Column percentages are calculated and may not total 100% due to rounding.

Note: Dashes “-” are displayed for cells with less than 5 counts following the CDC cell size suppression policy.

[†] Odds ratios measure the association between the decedent having the weapon type, or system level characteristic and the race of the decedent being NHW. Each adjusted odds ratio used AI/AN as the reference group.

[§] Chi-squared test result for difference between AI/AN and white significant at p<0.05.

¹ This category includes decedents who were identified within zip code tabulation areas identified as overlapping Reservation or trust lands (RL) identified in the USEPA tribal lands table.

² American Indian/Alaska Native is defined as Person with origins among any of the original people of North America and who maintains cultural identification through tribal affiliation or community recognition (includes Alaska Natives).

³ non-Hispanic white (NHW) is defined as Person with origins among any of the original peoples of Europe, North Africa, or the Middle East with no Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin (Ethnicity).

⁴ We performed chi-square tests to compare American Indian/Alaska Natives (referent group) to Non-Hispanic White decedents.

⁵ All Other includes: Other weapon includes biological weapons, intentional neglect, non-powder gun, other transport vehicle, personal weapons, shaking, sharp instrument, and other (e.g., taser, electrocution, nail gun).

CHAPTER 5: DISCUSSION

Summary of Results

Where AI/AN violent deaths meet reporting requirements, they are higher than NHWs. A significant percentage of AI/AN decedents for each manner of death occurred on RL, the sparse fractions of original lands where indigenous communities have been effectively quarantined for centuries. Of all seven states with violent homicide counts high enough to report rates for AI/ANs, they are substantially higher than NHW rates at a range of 1.5 to 16 times. AI/AN undetermined intent (UD) deaths met reporting standards for Arizona and corresponding Navajo region, home of the largest (Navajo) reservation in the US. UD rates were nearly three times the rate of NHW in Arizona and over twice as high as NHWs across the Navajo Area region.

This finding is as we expected as researchers, and they validate the lived experience of every single American Indian and Alaska Native person in the United States. The truth is the rates and counts for AI/AN are likely greater because of the misclassification of many AI/AN as NHWs. IHS Areas further illustrate cultural regionality in violence and shine a light on the aftermath of policies and practices of institutional racism. Of all AI/AN incidents of violent homicide, UD, and LI between 2005-2020, approximately 49% occurred on RL where Tribal organizations estimate only 30-40% of all AI/AN in the U.S. live. Many eastern states (mainly in the Nashville Area), with documented AI/AN populations report zero deaths of AI/AN in NVDRS. For example, Arkansas is home to 27,000 AI/ANs from 21 federally recognized Tribal nations, yet zero violent deaths among the population are reported and NHWs reflect a moderate rate (6.3 per 100,000) of homicide.

Victims of AI/AN ancestry were younger than NHW for all manners of death, with the lowest mean ages reported on RL for homicide and UD, and only +0.2 years for LI victims on

NLT. Guns are the biggest killer in incidents of interpersonal violence, especially for young boys and men in high violence areas and those who find themselves entangled with armed agents of law enforcement. After death, AI/AN RL victims of violent death are less likely to have had a law enforcement narrative documented across all manners of death. The measures of “law enforcement narrative” consists of free-text, so entries of “missing”, “not available”, “no Tribal report”, etc. were counted as complete. Therefore, these results are undercounts of the true race/place disparity. Why, when there are often multiple jurisdictions activated in the case of an AI/AN RL violent death, are fewer law enforcement reports recorded in NVDRS? Perhaps there is a reasonable justification, perhaps its lingering institutional racism, or perhaps AI/AN have been framed by white men in power, priests, police, generals, administrators, policy-makers, presidents, in a whitewashed lens as people from a failing active genocide that needs resurgence by any means necessary. The people hardest stricken by violent killing in this study are families of young, undereducated American Indian and Alaska Natives men and boys on resource-deprived Reservation Lands.

Integrated Discussion

Violent homicide, UD, and LI claimed the lives of 3,175 AI/ANs and 72,612 NHWs between 2005-2020. AI/AN represent approximately 2% of the U.S. population but 3% of all deaths from lethal violence in this study. The majority of homicide and LI victims were adults between the ages 18-55 years, were male, and involved a firearm. The majority of UD victims followed along the same demographics with a primary weapon type of poisoning. The skew toward males homicide victimization follows trends consistently reported by the CDC across all racial and ethnic groups for the past five years (Ertl et al., 2019; Kennedy, Cerel, Kheibari, Leske, & Watts, 2021; Petrosky et al., 2020; Sheats et al., 2022; Wilson et al., 2022). While

males make up the majority of our sample of decedents, research shows they are also highly linked to incidents as perpetrators (Ertl, 2019; Petrosky, 2020; Sheats, 2022; Wilson, 2022). The role of intimate partner violence (IPV) cannot go unstated in this study. Although, IPV was not included as a research aim, the body of literature on IPV resulting in homicide of women (femicide) is stark. Kivisto (2015) reported nearly 1 out of 7 homicides worldwide involved the death of an intimate partner with men 4 times as likely to have perpetrated the offense. Other research shows IPV rates of females are 4 to 5 times higher than males (Campbell, et al., 2007), and in 2022, the CDC reported 45.3% of homicides among females in 2019 were related to IPV (Wilson, Liu, Bridget, et al., 2022). Thus, homicide risks associated with sex (and gender) are paramount, but compounded in populations with large proportions of youth, and low educational achievement. The severity is clear and remains a likely undercount of the issue given the ongoing investigation of the unknown numbers of missing and murdered indigenous women (MMIW).

Perhaps the most alarming finding that aligns with the literature on violent death is that approximately 10% of all homicides occurred among children 0-17 years of age. Race and ethnicity played a role in UD as well, where a larger percentage of AI/AN UD deaths were among children between 0-17 years (15.0%) compared to NHW (5.3%). A study in 2022 found that infants less than one year old, had higher homicide rates compared to children 1-14 years (Wilson, Liu, Bridget, et al., 2022). Previous works using NVDRS to understand UD among children found that the majority of their sample were also less than one year old (81.0%) and male (62.0%) (Wu et al., 2017). As the demographics of children and infants grows with the population, prioritization of infants and children for homicide prevention is warranted. Because this study focused on the AI/AN population these findings are exponentiated due to the population trends in Indian Country. In 2021, the population of AI/AN (reported in Census as

AI/AN “Alone”, i.e., not including two or more races, or ethnicity) under 18 years of age was 26.4%, compared to 22.1% of NHWs; the AIAN-alone estimated percentage of individuals under five years was 6.0% compared to 5.6% of NHWs (U.S. Census Bureau, n.d.).

Approximately 69.7% of all study decedents had a high school diploma or GED recorded as their highest education level completed. Lower strata for education level were reported for AI/AN across all manners of death and inversely, NHWs had consistently higher reports of having earned a college degree. AI/AN western educational achievement is markedly different from other racial/ethnic groups in the U.S. The National Center for Education Statistics (2008) reported AI/AN students had drastically lower public-school enrollment (1.2%) with most (46%) of those in rural (or remote) areas (DeVoe and Darling-Churchill, 2008). This suggests many AI/AN children are receiving inadequate or alternate education. Of the list of 367 American Indian Boarding Schools from the National Native American Boarding School Healing Coalition (2020), 73 remain open today. The states with the highest number of schools are Oklahoma (83), Arizona (51), Alaska (33), New Mexico (26), and South Dakota (25) (National Native American Boarding School Healing Coalition, 2020). Fifteen schools were identified as still boarding in 2020 with the longest operating school active today located in Salem, Oregon (Chemawa Indian School).

Adults with higher education are associated with lower unemployment rates and higher median incomes therefore education is a strong social determinant of health to include in our study. As of 2014, AI/AN had the lowest percentage (14%) of adults who had earned at least a bachelor’s degree (NCES, 2008). AI/AN are severely underrepresented in post-secondary education with attendance rates reported at 17% compared to 60% of the total U.S. population according to the Postsecondary National Policy Institute (2019). A U.S. Department of

Education report on postbaccalaureate enrollment showed that in fall of 2014 AI/ANs accounted for 0.005 percent of the 2.9 million enrolled students and only 41% met the 6-year graduation rate, the lowest of all racial groups (Musu-Gillette et. al., 2017). Additionally, the AI/AN population recorded a drop in degrees awarded across the board between the years 2013 and 2014 with the highest at the bachelor's level (-5.7%), followed by Masters' (-5.4%) and Doctor's (-4.3%) (NCES.ed.gov report). Educational achievement is also skewed by sex with approximately 60% of all degrees awarded to AI/AN men. Still, as of 2006 there were 32 tribally controlled colleges and universities (TCU) in 12 states, an increase of 23% between 2001-2006 (DeVoe and Darling-Churchill, 2008). TCUs may prove to be an important catalyst in spurring alternate (indigenous, non-western) educational advancements that are tailored to AI/AN community needs.

Homelessness was highest for NTL AI/AN and AI/AN decedents were much less mobile according to our migration variable. The operationalization of a migration variable, specifically for AI/AN, centralizes the role of place in cultural and legal terms where and when certain health services and other community resources are restricted to RL (e.g., IHS eligibility and service⁵),

⁵ Indian Health Service Eligibility Requirements:

1. Is of Indian and/or Alaska Native descent as evidenced by one or more of the factors:
Meaning an individual must be of **Indian descent** and belong to the Indian community which may be verified by tribal descendency or census number. An individual must be a member, enrolled or otherwise, or an Indian or Alaska Native Tribe or Group under Federal supervision.
2. An individual resides within his/her Tribal Purchases/Referred Care (PRC) delivery area The Tribal PRC delivery area encompasses the Reservation, trust land, and the counties that border the reservation. Resides on tax-exempt land or owns restricted property.
3. Residency documentation for eligibility established with the new IHS-976, PROOF OF RESIDENCY form. The form became effective in 2020 for all IHS federal sites. Tribal sites have the option to utilize the IHS-976 form or establish their own form for documentation.
4. Notification and authorization of approval for payment. An individual must be authorized by PRC authorizing official for the payment of services.
5. PRC funds are limited to the medical or dental services considered medically necessary and listed within the established Area IHS medical/dental priorities. A copy of the Area IHS **medical/dental priorities** is available at the local IHS health centers and hospitals including Priorities or Care section of this webpage.

and other opportunities (i.e., employment, educational institutions) are only accessible externally. The connection between systemic racism and policies that purposely disadvantaged AI/AN families and lands reduce access to housing, employment, social resources, neighborhood and educational quality (Williams & Mohammed, 2013). Thus, systemic/institutionalized racism conceptually aligns with our measures of homelessness and migration. Homelessness among AI/AN may be a measure of an operationalized mix of disadvantage systems at place in a network and migration may be one indicator of an attempt to escape the localized disadvantage of a reservation society. Studies show AI/AN are over-represented among homeless populations (Kasprow, 1998, Cole, 2020). A study on health risk factors among AI/ANs in Oklahoma showed the AI/AN sample (n=109) were more likely to experience discrimination and more likely to sleep on the street versus shelters (Cole, Hebert, Reitzel, Carroll, & Businelle, 2020). Another study looked at the homeless veteran population through the Veterans Affairs' Health Care for Homeless Veterans program in 71 cities and found that AI/AN were overrepresented by 19 percent compared to all other races (Kasprow & Rosenheck, 1998).

Resource separation specific to the AI/AN population is based on a process of repetitive proof of AI/AN ancestry, status of each Tribal nation, and their lands. One clear example is process (outlined on the previous page footnote) by which the health of individual citizens from federally recognized Tribal Nations is overseen by the Indian Health Service (IHS). Despite the direct delivery of health services through IHS, AI/AN communities suffer from massive health

An individual medical need at the time of services must be within the medical priorities being funded at that time.

6. An individual must apply for and use all alternate resources that are available and accessible, such as Medicare A and B, state Medicaid, state or other federal health program, private insurance, etc. The IHS facility is also considered a resource, and therefore, the PRC funds may not be expended for services reasonably accessible and available at IHS facilities.

disparities (NCAI, 2021). Development of healthcare programming tailored to a community's needs is a lengthy process and healthcare budget is a key input. IHS spending on IHS healthcare in 2017 was \$4,078 per capita in the eligible services population (United States Government Accountability Office, 2018). In contrast, spending in other branches of the US healthcare system far outweigh IHS with the Veteran's Administration reporting \$10,692 per capita, and Medicare at \$13,185 per capita (2.6 and 3.2 times higher than IHS spending) (United States Government Accountability Office, 2018). The severe deficit in healthcare expenditure for the AI/AN population requires careful strategic management and prioritization of funds for the type and level of care the service population requires. Targeted research efforts for important health outcomes like violence out of reach for many Tribal nations. Many times, health care needs are not met through IHS leaving a crucial gap in communities and unmet needs.

Another significant barrier for Indian Country is the issues of competing health disparities. Tribal nations find themselves with more health issues than there are time, funding, and attention to adequately address. In the case of violence, epidemic rates of youth suicide (Ivanich et al., 2022, O'Keef et al., 2019, Burrage, Gone, and Momper, 2016, Tower, 1989) demands substantial attention and resources from Tribal nations and organizations. Additional attention to high-level research efforts favors inferential designs using aggregated national or state data (that include AI/AN without addressing the group directly). The direction of focus of homicide is even further siloed into aggregated reports of broad domains like the imbalance of violence toward female victimization and incidents attributed to intimate-partner predisposing factors. The limited scope of human resources and funding leaves a deficit understanding of the total impact of AI/AN homicides and UD deaths out of focus.

The overwhelming number of incidents involving a firearm confirms previous studies on violent deaths. Differences for AI/AN and on RL may also reflect resources availability. Lower education, leading to less employment opportunity, especially in highly disadvantaged areas like reservations may reduce access to firearms and especially handguns. Jurisdictional scapegoating in Indian Country which seeds the poor response to violent deaths and incident reporting of AI/AN peoples, especially those on reservation lands, is also a possible culprit contributing to underreporting. Variables associated with the death investigation process showed small differences in autopsy and toxicology performance, but AI/AN (23.7%) were more likely to have a missing law enforcement narratives NHWs (14.8%). The essential term in these deaths is “intent”, which involves triggering a set of investigative procedures to determine the cause and manner of death. Law enforcement play a significant role in collection of incident variables, so the lower rates of law enforcement narratives for AI/AN deaths is cause for concern. Which leads to the idea that there may exist an interaction with Public Law 280 states. NCAI (n.d.) listed the estimated highest populations of AI/AN as Alaska, Oklahoma, New Mexico, South Dakota, and Montana. PL-280 could prove to be a strong moderator of homicide as some legacy mandatory PL-280 states (Alaska and Minnesota) and elected PL-280 states (Arizona, Nevada, South Dakota, and Wyoming) states exhibit extreme homicide rates as reported in the present work. AI/ANs, who made up an estimated 2.9% of the U.S. population in 2020, with an estimated 30% living on reservation lands (NCAI, n.d.) would each trigger the jurisdictional matrix.

Indian Country has received new attention to murders and cases of unreported violence veiled as missing cases in states we have identified with already high disparities in violent death, like Alaska and Montana. With the agenda to acknowledge and rectify cases of Missing and

Murdered Indigenous Women (MMIW), the momentum has expanded the titles to encompass the missing and murdered people (MMIP) in all indigenous communities across the U.S. and Canada and specifically, girls and two-spirit (MMIWG2) community members.

In 2019, Executive Order 13898 (2019) formed the Task Force on Missing and Murdered American Indians and Alaska Natives or Operation Lady Justice (OLJ). Statements from the Deputy Bureau Director in the Office of Justice Services in the Bureau of Indian Affairs (Addington, 2019) highlighted the gaps in criminal justice systems across Federal, state, Tribal and local governments where responsibility overlaps for the AI/AN community. Gaps are associated with how law enforcement officials handle and follow-up cases involving AI/AN though underreporting, racial misclassification, gender or racial bias, and lack of law enforcement resources required for appropriate follow-up (Addington, 2019). The mission of the Task Force is to 1) Conduct appropriate consultation with Tribal government regarding MMIP; 2) Develop model protocols and procedures including best practices for MMIP (e.g., improving law enforcement response, data sharing and communication; improving use of criminal databases [National Missing and Unidentified Persons System (NamUs), the National Crime Information Center (NCIC), and the Combined DNA Index System (CODIS) including the National DNA Index System (NDIS)]; 3) Establish a multi-disciplinary and multi-jurisdictional review team; 4) Address the need for greater clarity of roles, authority, and jurisdiction throughout the lifecycle of AI/AN MMIP cases (including facilitating formal agreements, education and outreach, publishing a best practices guidance).

While this study was designed shed light on the lethal violence among AI/AN, the violence perpetrated through history by colonial institutions of government, economic enterprise, and academic spheres should be equally weighed. A great deal of this study focuses on

institutionalization of racial biases toward AI/AN which have also been used to restrain other communities of color. These broken systems and their promotion of unequal representation of collective histories, traumas, knowledge, and epistemologies of unique American groups are hardened by power imbalance. This leaves little to no power to the communities to change the course of future lived experiences. Power must be shifted to afford freedom to change in the most vulnerable communities like AI/AN .

Violent homicide, undetermined intent (UD), and legal intervention (LI) deaths, indiscriminately affect all Americans. Direct trauma of each loss leads to a host of secondary victims in the family and community. Navigating the weight of that loss is directly linked to the resources each secondary victim has access to. Persistently disadvantaged groups and communities like American Indians and Alaska Natives bear a disproportionately heavy burden with severely insufficient resources. Our hypotheses used a historical context to prove that place has a powerful impact in violent homicide, undetermined intent (UD), and legal intervention (LI) deaths among American Indian and Alaska Natives. Where we were able to report, our assumptions were correct in that NHWs rates would be relatively stable compared to AI/AN and that marked differences would exist dependent upon the place.

Limitations

The proposed study has three important limitations, racial misclassification, data access, and data availability. First, the issue of racial misclassification is a substantial concern for the AI/AN population. If we consider the range according to previous racial re-classification works (Stehr-Green, Bettles (2016), Joshi and Lan, (2018)), this study could shift to include an additional 10-12 percent of AI/ANs. Not only would it increase the number of AI/AN and associated disparities, but it would also remove incorrectly categorized race counts for other

racial groups. This sizable inaccuracy currently remains undetectable without more research and funding of Tribal epi-centers operating racial classification correction projects.

Secondly, data access varies widely for NVDRS, and use of the data has use restrictions important to this study. Levels of interpersonal lethal violence in NVDRS has increased steadily since 2010, but part of the rise is due to new states/territories/jurisdictions becoming available. For example, Hawaii and Florida are included in the system but reported zero entries into NVDRS according to our sample. Additionally, there are instances where only a portion (certain counties) of a state were included, left, then returned. This is the case for counties in California and Texas currently only reports for 4 of their 254 counties. When data are available across states, use of the data is restricted by cell size. In this study a majority of AI/AN data do not meet the cell size requirements for rate calculation and many others do not meet regular cell-size reporting policy standards. Not being allowed to calculate proportions due to the population size is a clear example of systemic racism. Not only do these policies affect this study, but all studies using small population data. Other groups affected are Asians and Pacific Islanders. Pacific Islanders have survived a similar history as AI/AN and could have similar trends in violent death. However, due to the small size of their population and the lack of any data for Hawaii, there is an immense unknown for that group.

The problem is that death counts are final, they are not derived of estimates and the communities have experienced and processed each death accounted for in this study. The United States federal government practices careful restriction of surveillance data reporting due to potential for identification of study populations as a protective measure for communities. When governmental bureaucracy prevents the representation of AI/AN deaths in official reporting, it perpetuates the structural racism toward indigenous communities and unduly impacts AI/ANs

beyond the initial death itself. At what point do we acknowledge that the harm that outweighs the benefits of that protective policy? How many more AI/AN have to die violently before Tribal-serving governments and organizations are allowed to receive this vital information that exists in these restricted access databases? This appears to be a primary reason prevention efforts for AI/AN could be failing communities across the U.S. Without accurate data including the rates across Indian Country in this study that we have calculated but are not allowed to present, the public health significance related to violent deaths among AI/AN cannot be fully stated. Violent deaths go undercounted, limiting the rationale for additional resources and funding to intervene. Nevertheless, this is the most comprehensive data on violent deaths for all participating states (48) and DC between the years 2005-2020 currently available through NVDRS. As the population of AI/AN continues to transform, through correcting misclassifications and advancement of Census data collection standards and access, the role of NVDRS will continue to play an important role in understanding and advocating for resources to help prevent fatal violence.

Lastly, the issue of data availability. Poor administrative efforts to acknowledge AI/AN ancestry (even state vs federal recognition) and lands is a crucial dilemma. Monitoring physical geographical spaces in Indian Country is an evolving challenge as types of land vary so widely and there exists no lead agency to take on the project. It is also relevant to point out the existing acknowledged Tribal lands are far smaller than the accustomed land original ceded and protected under treaty rights specific to each Tribal nation and likely do not account for lands recently purchased by Tribal nations or returned to them by private owners. The intentional exclusion of originally ceded lands is a separate but equal social justice issue in for AI/AN communities. We have provided the best estimate of populations on RL as possible using reliable linked data. Still,

the population estimates used for calculations of race in this study are skewed toward reservation lands in two ways. First, ZCTAs are overlapping and do not stop at the boundary of reservation lands as they are winding and patchy. This means there are decedents who were categorized as RL decedents but could have actually occurred off RL but in an adjoining ZCTA. Second, there is no reliable data for population on and off RL available at the present time. Therefore, state populations for AI/AN were used to calculate both RL and NTL rates. We acknowledge that this skews the rates toward RL in areas with low RL residency and toward NTL where RL residency is high. Each state will not align with the 30/70 estimate reported by NCAI, so we did attempt to collect data from the Census, American Community Survey, and ArcGIS. Several calls were made to the Census directly and we are currently awaiting a return call. Other data available were from the 2010 Census which would undercut current AI/AN numbers due to updated data collection methods and 2010 would not match the most complete data in NVDRS. The American Community Survey had information at the ZCTA level, but the race/ethnicity combinations did not match our target samples of Hispanic and non-Hispanic AI/AN and NHW. Despite these limitations, the results of this study contribute to our most comprehensive representation of violence-related mortality for AI/AN to date which remains undercounted.

Directions for Future Research

The future of violence research is budding and there are many gaps needing filled for many populations including AI/ANs. The potential to incorporate new census categories and summary files for AI/AN including ZCTAs when they become available is a promising avenue. Use of this new data would help to create a larger sample of AI/AN by including those responses to the most recent census that include multiple race categories in addition to the original set. It

would also help to better align RL and NTL populations by linking either the ZCTA data used in this study or other newer lists of zip codes associated with Indian Country.

The role of new technology like GIS to make better use of AI/AN land layers and the possibility of collaborating amongst Tribal nations to create their own layers is a fruitful research space. For example, there are projects at the (internal) Tribal level to map their reservation, ceded ancestral lands and other resources under their management. That coupled with students at TCUs, where the power shift toward indigenous researchers is nurtured, could be a great combination.

Spatial analyses of proximity to high violence ZCTAs could uncover hidden risk factors. As highlighted in some of the MMIP work, co-location of high violence ZCTAs to what are known as “Man camps”, resulting from oil booms and other big industry are a concern. Many on the front lines of the environmental justice movement in Indian Country also have high encounters with private security contractors, who are neither military nor law enforcement but serve the same services. The NVDRS analysis guide indicates deaths at the hands of these groups are not included as a legal intervention, thus are difficult to tease out of the larger homicide data. The future of violence research should also equally aim at healing through Tribal landscapes. Studies on traditional cultural places (TCP) to better understand the place from an indigenous lens are necessary steps in developing and evaluating prevention for AI/AN as many healing practices revolve around environmental reciprocity.

Conclusion

This dissertation describes homicide, undetermined intent (UD), and legal intervention among AI/AN by multilevel place, select individual and social characteristics, and to NHWs. In nearly all comparisons and at every level, the pervasive disparity in violent deaths for AI/ANs was

observed. A narrower look at sovereign RL reveals even higher violent disparities, despite the known undercounting due to misclassification issues for the U.S. AI/AN population.

Operationalization of culturally-specific place measures (RL/NTL) lends special strength to this analysis and emphasize the historical antecedents to contemporary social determinants of violent homicide for AI/ANs. The toll of this burden is multidimensional, through loss of economic capital, emotional grief, and lasting trauma that contributes to the disadvantaged social environment for some AI/AN communities. Indigenous populations must also account for traditional loss of a valued and productive member of the specific Tribal culture, an indicator of indigenous health remain unseen in mainstream public health. The addition of this most destructive and traumatic type of violence for communities who persistently struggle with lacking resources of many types (economic, social, cultural, etc.) increases the burden with each coming generation. Even worse, institutional barriers to reporting on violence continue to shield Tribal nations and Tribal-serving organizations from empirical evidence that the problem exists and is as bad, or worse than they perceive it to be. This dissertation is a small step in closing the gaps in understanding violence in AI/AN communities using the best available data. AI/AN homicide, some (reportable) UD, and LI is higher by population than NHWs. When these incidents occur, AI/AN victims are almost always younger than NHWs, cutting years of life and cultural resilience.

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