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# A Systematic Review of Research Methodologies in American Indian and Alaska Native Suicide Research From 2010 to 2020

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***Objectives:*** American Indians and Alaska Natives (AIANs) experience significant disparities in their prevalence of suicidal ideation, attempts, and deaths when compared to all other racial/ethnic groups in the United States. In this systematic review (SR), we aim to examine the methodologies employed in AIAN suicide research during the past decade to highlight successful methodological practices and provide suggestions for improving future research. ***Method:*** The authors followed guidance by Siddaway et al. (2019) for conducting SRs. The databases PsycINFO, Ovid Medline, The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Education Resources Information Center, Bibliography of Native North Americans, Sociological Abstracts, and Academic Search Premier were searched for scientific articles published between 2010 and June 5, 2020 that specifically focused on AIAN suicide. The search yielded 937 citations; 240 full-text articles were screened for inclusion, and 72 articles were included in this review. ***Results:*** Findings revealed significant heterogeneity among methodologies employed in the corpus, making it difficult to draw robust conclusions about AIAN suicide. Notably, research partnerships that were initiated by an AIAN Tribal Nation in collaboration with a research team yielded meaningful contributions and positive outcomes as compared to traditional community-based participatory research approaches. Finally, several critical gaps in the literature emerged including a lack of data on sexual and gender minority AIANs, urban, and multiracial AIANs. ***Conclusions:*** Based on these findings, we propose the following recommendations: (a) standardize the assessment of suicide; (b) increase partnerships between Tribal Nations and researchers; and (c) pursue research centering specific high-risk populations (e.g., urban, sexual and gender minority, and multiracial AIANs).

***Public Significance Statement***
This systematic review demonstrates that the American Indian and Alaska Native (AIAN) suicide literature includes great variance in selected methodologies, indicating a need to standardize our approaches in future research so that knowledge can accrue. It is crucial to increase the number of collaborative partnerships between Tribal Nations and research teams to better understand the suicide crisis in "Indian Country." Significant gaps still exist in the literature such as a lack of data on particularly vulnerable AIAN populations (e.g., urban AIANs, sexual and gender minority), as well as AIAN suicide clusters, and researchers should focus on exploring these gaps in future efforts.



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American Indians and Alaska Natives (AIANs) in the United States (U.S.) face significant health disparities compared to other racial/ethnic groups (Xu et al., 2018). This includes the significant level of suicidality seen in AIANs, including a high prevalence of suicidal ideation, attempts, and deaths by suicide (Center for Disease Control and Prevention, 2010). While suicide is a pressing public health issue within the U.S. across racial/ethnic groups, research has found that AIANs have higher rates of death by suicide than any other group (Leavitt et al., 2018). Among AIANs aged 15–24, rates of death by suicide are greater than three times than that of similar aged people from other racial backgrounds (Leavitt et al., 2018). For AIANs under 18, suicide rates are nearly four times higher than adolescents of all other races (Gone & Trimble, 2012). As a result of this suicide crisis, a published call to increase suicide prevention efforts was put out by the U.S. Surgeon General in 1999 (U.S. Department of Health and Human Services (HHS), Office of the Surgeon General, and National Action Alliance for Suicide Prevention, 2012). Despite this call to action, the suicide rates have continued to increase for AIANs since 2003 (Leavitt et al., 2018). Scientific research by suicidologists presents an opportunity to learn more about this pressing issue and develop a broader understanding of suicide prevention and treatment options.

Over past decades, researchers have attempted to make sense of the suicide crisis among AIANs. Reviews of the literature have noted several prominent theories that have been published to help guide our understanding of AIAN suicide (O'Keefe et al., 2018). These theories include the Transactional–Ecological Framework, theories on Historical Loss, and the *Cuqyun* Model (Alcántara & Gone, 2007; see also Tucker et al., 2016; Allen et al., 2014). Other researchers have focused on culminating our knowledge about the risk and protective factors for suicide in AIANs (Borowsky et al., 1999; see also Harder et al., 2012). Particularly, interesting findings in this area have demonstrated that suicidal ideation and behaviors may differ across communities due to the cultural heterogeneity of Tribal Nations (Bolton et al., 2014). This is notable as there are over 570 unique federally recognized AIAN Tribal Nations within the U.S. and research suggests that suicide rates vary by Tribal region, with some of the highest rates reported in Indian Health Service (IHS) service areas of Tucson, Aberdeen, and Alaska (Indian Health Service, 2012).

However, much of the research has historically focused on identifying risk factors for suicide from an individualistic theoretical framework (Thira, 2014; see also Wexler et al., 2015). Depression, perceived discrimination, history of trauma, and substance use are some of the prominent risk factors for suicidal ideation or behaviors in AIANs (Burnette & Figley, 2016). On the other hand, protective factors often fall into four broad categories: Individual, family, community, and cultural factors (Wiglesworth et al., 2021). Past research has demonstrated that family characteristics (e.g., family caring) are the most consistently protective across studies; however, family factors have not been studied in adult AIANs (Wiglesworth et al., 2021).

A large portion of this collective knowledge on AIAN suicide comes from epidemiological surveys such as the Youth Risk Behavior Surveillance Survey, the National Longitudinal Study of Adolescent to Adult Health (Add Health), or the National American Indian Adolescent Health Survey (Borowsky et al., 1999; see also Ivanich & Teasdale, 2018; Manzo et al., 2015). While these surveys provide important insights, community-tailored research about AIAN suicide is less common. Wexler et al. (2015) found that only 20 empirical articles were published on risk and protective factors for AIAN suicide from 2004 to 2014. This may be due to the unique barriers present when conducting research with AIAN communities.

Several specific barriers to conducting suicide research with AIANs have been noted previously in the literature (Olson & Wahab, 2006). First, many Tribal Nations are hesitant to engage in research due to a long history of unethical and harmful research practices perpetuated against AIANs (Gone, in press; see also National Research Council, 1996). Non-Indigenous researchers are often unaware of Tribal sovereignty and may lack cultural sensitivity when conducting research on crucial topics such as suicide (James et al., 2018). They may also view AIANs as a homogenous group, thus complicating the categorization of race, ethnicity, or nationality of AIANs who participate in research (Olson & Wahab, 2006). Some AIAN Tribes have addressed this by creating Tribal Institutional Review Boards (IRBs) to ensure that their sovereignty and interests are protected (Gone, in press; Hull & Wilson Diné, 2017). However, only 11 IHS Area IRBs and 15 Tribally operated IRBs currently exist (Ketchum & Meyers, 2018). While Tribal Nations can benefit from research to address the suicide crisis, there is a lack of clear guidance on best practices for conducting suicide research in these populations, which may hinder the types of research being conducted and resultant knowledge appearing in the literature.

Past researchers have posited some important, specific recommendations on how to improve the state of AIAN suicide research. Wexler et al. (2015) recommended an increase in qualitative and mixed-method inquiries into AIAN suicide, so that suicidologists working with AIANs could take a more discovery-based approach while focusing on the social determinants for suicide. Olson and Wahab (2006) further noted that efforts should be made to increase funding for AIAN suicide research, to aggregate data across studies, to conduct more psychological autopsies and in-depth case studies, and to involve Tribal leaders in study design, implementation, and evaluation.

While there is clearly a need for methodologically rigorous and targeted research efforts within the field of AIAN suicide, no research to date has systematically examined the methodologies being utilized in AIAN suicide research to build insight on how to improve our future research efforts. Thus, in this systematic review (SR), we seek to examine the past decade of AIAN suicide literature with a specific focus on the methodologies being employed in the field. We believe that by reviewing how we are studying suicide in AIANs, we can better understand how to improve our collective body of knowledge moving forward and ensure that rigorous and culturally appropriate methodologies are being used as standard practice. Studies were examined in terms of key methodological features, and comparisons across studies are examined and contrasted to identify gaps and suggest future recommendations to help improve the knowledge base concerning suicide and AIAN peoples.

# Method

## Background

This study emerged from a cross-institutional collaboration of Indigenous identifying doctoral students (authors L.R., A.W., M.P., A.F., and M.A.) in the fields of clinical and counseling psychology who were interested in conducting meaningful research with peers from across the U.S., as well as receiving further training and guidance from an experienced American Indian (AI) academic researcher (author J.P.G) who mentored the team throughout the process. This work is one in a series of publications resultant from these efforts, including two sister manuscripts forthcoming on risk (Fetter et al., 2022) and protective factors (Wiglesworth et al., 2021) for AIAN suicide as well as publications on suicide interventions for AIANs (Pham et al., 2021a, 2021b).

In this article, we adhere to guidance established by Siddaway et al. (2019) for conducting an SR. In adhering to this guidance, we were interested in answering the question, *How have researchers investigated the topic of suicide for AIAN peoples during the past decade?* Given the interest in capturing variable methodologies, the suicide construct was kept purposefully broad to capture all potentially relevant research. As the aim of this review was to comprehensively capture all methodologies employed in this area of research—both quantitative and qualitative—study quality was not assessed owing to marked heterogeneity in the literature.

## Search Strategy

A social sciences librarian (author A.R.) who specializes in assisting with SR methodologies was consulted for her expertise in conducting comprehensive searches of the literature. First, A.R. designed strings of search terms to broadly capture literature relevant to suicide-related constructs and AIAN populations in the U.S. Two authors (L.R and A.W.) collaborated with the librarian to refine the scope of search terminologies and identify relevant bibliographic databases most likely to yield research on AIAN suicide.

Both keywords (e.g., suicide or suicides or suicidal or suicidality or "murder-suicide" or "homicide-suicide") and subject headings (e.g., self-destructive behavior) were used to target the desired literature across seven databases. The primary search strategy was designed in PsycINFO via Ovid, and the full search string is available in Supplemental Materials. The search was then translated to six other subject specific and multidisciplinary databases (see Figure 1). Results were limited to peer-reviewed journals. There were no limitations regarding publication language, but results were limited from 2010 through the date of the search to track recent trends.

The search was conducted on June 5, 2020 and yielded a total of 937 items from the seven databases. Deduplication using EndNote identified 410 unique items. The 410 items were then exported into the online screening tool Rayyan to allow for independent, masked screening (Rayyan, Ouzzani et al., 2016).

## Article Screening

### *Screening Criteria*

There were three primary criteria for including returned citations in the current review. First, articles were required to satisfy the scope of the review by being published online or in print since 2010. Second, articles were required to include at a sample of at least 90% AIAN participants or include a separate analysis for AIANs. Studies featuring only Indigenous peoples from other parts of the world were excluded. Finally, articles were required to explore a suicide-related construct, defined as *suicidal ideation*, *suicide attempt*, or *death by suicide*. Articles related to nonsuicidal self-injury that did not include a suicide-related construct as defined here were excluded.

### *Screening Process*

The two lead authors L.R. and A.W. assessed each article for eligibility and inclusion in the present study. Masked-review mode was configured in Rayyan for screening to ensure methodological rigor and assess inter-rater reliability with respect to the inclusion criteria. During Phase 1 of screening, authors L.R. and A.W. independently reviewed all 410 unique titles and abstracts to assess which articles clearly did not meet the search criteria (e.g., studies reporting samples from outside the U.S.). During the screening process, 36 borderline cases were identified. These cases were individually reviewed by the coauthors and a consensus decision was made to include or exclude them from the current review (per Siddaway et al., 2019). The two screeners identified 240 articles that appeared to meet the inclusion criteria based on the initial screening.

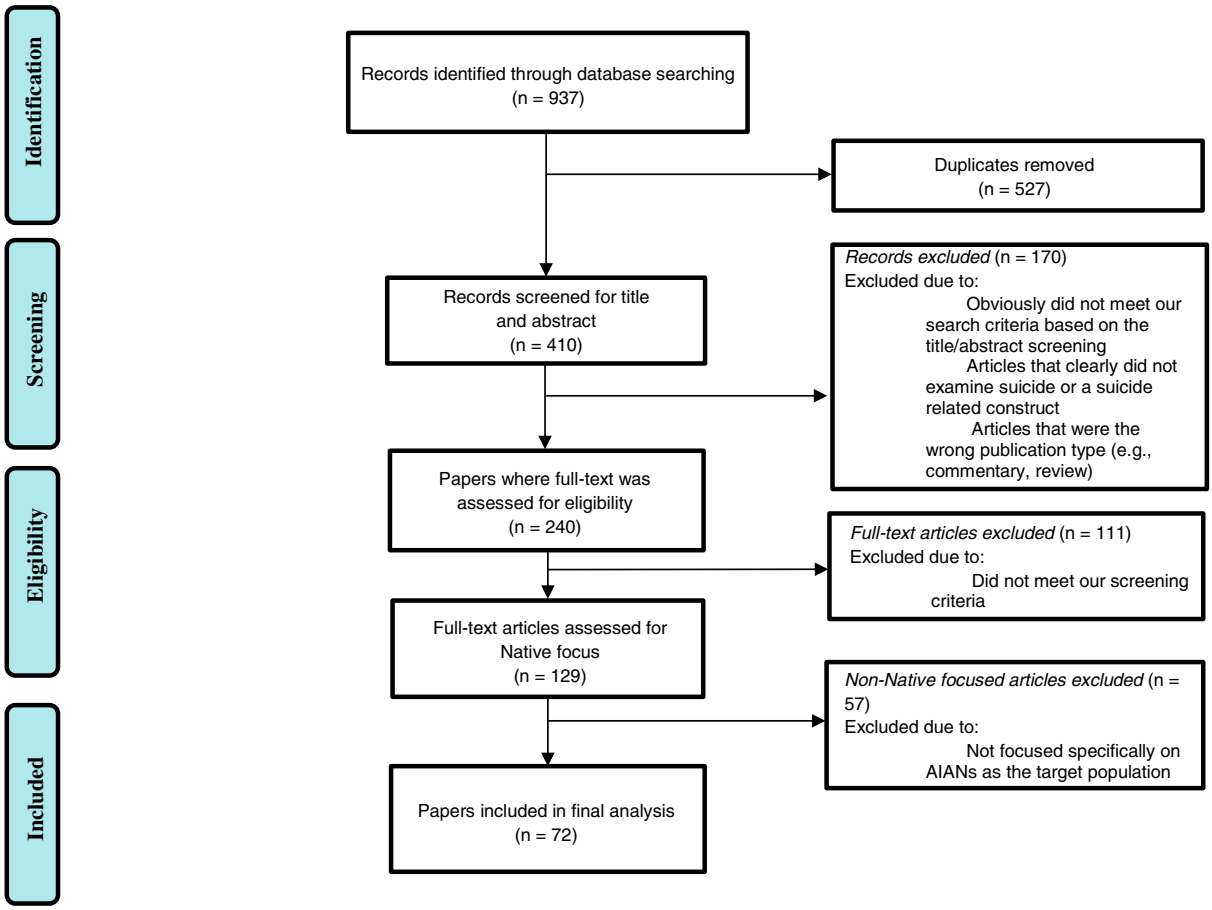
During Phase 2, four screeners independently reviewed the full texts of all remaining articles. The first pair of screeners (i.e., authors L.R. and A.W.) independently reviewed articles with author last names A-K, while the second pair of screeners (i.e., authors M.P. and M.A.) independently reviewed articles with author last names L-Z. During the screening process, 31 borderline cases were identified by the four screeners. These cases were individually reviewed by each screening pair and a decision was made to include or exclude them from the current review. After reviewing the full-text articles, a total of 130 articles met the inclusion criteria for the final screening phase.

During Phase 3, the four screeners identified a subset of articles in which AIAN peoples were a *primary focus* of interest within the study. For this paper, AIAN-focused studies can be understood as studies that explicitly stated their aim *to recruit or select AIAN participants with the intention of drawing conclusions related to suicide in AIAN populations*. In this final screening Phase, 5 borderline cases were identified by the four screeners and a decision was made through consensus to include or exclude them from the current review. After reviewing the final articles, 72 articles were identified in which AIANs were a primary focus of interest within the study.

## Data Extraction

The final 72 articles were transferred to a 5-person extraction team who systematically identified and coded the methodologies employed therein. The extraction document used in the present study was adapted from a template by The Cochrane Collaboration (Effective Practice & Organisation of Care, 2013). Data extracted from the articles were assigned to four broad categories: (a) sample characteristics (e.g., population, setting, number of participants, age range, and sex); (b) study design (e.g., timeframe, constructs studied, method of inquiry, measures used, and data collection procedure); (c) ethical considerations (e.g., Tribal oversight, administration or approval, and participatory research methods); (d) data analysis and results (e.g., statistical tests and brief findings, author

**Figure 1**
*PRISMA Flow Diagram*




*Note*. Databases searched include Psych Info by Ovid, Ovid Medline, The Cumulative Index to Nursing and Allied Health Literature (CINAHL), Education Resources Information Center (ERIC) via Elton B. Stephens Company (EBSCO Host Information Services), Bibliography of Native North Americans, Sociological Abstracts, and Academic Search Premier. See the online article for the color version of this figure.

interpretations). For each study, extracted information was systematically recorded in combined extraction documents (available on request from author L.R.). The first author randomly sampled 20% of the extraction documents to confirm standardized use and completion of the documents by the 5-person extraction team.

## Results

A PRISMA flow diagram (Moher et al., 2009), which includes an overview of the search and screening process, is found in Figure 1. Upon completing the three screening phases, we calculated a Kappa statistic (McHugh, 2012) to determine inter-rater reliability at each of the phases, with borderline cases qualifying as discordant ratings. Kappa statistics revealed strong agreement for Phase 1 ($\kappa = 0.82$) and Phase 3 ($\kappa = 0.86$) and moderate agreement for Phase 2 ($\kappa = 0.73$). Of the 72 studies, 46 (63.9%) measured suicidal ideation, 40 (55.6%) measured suicide attempt history, and 18 (25.0%) examined suicide deaths, with some measuring a combination of these variables. One included study did not fit into the above categories, as it adopted a qualitative methodology that examined participant thoughts, feelings, and experiences related to a broader concept of suicide (DeCou et al., 2013).

### General American Indian and Alaska Native Suicide Findings

Although not the direct focus of this SR, our analysis did reflect established knowledge about AIAN suicide. These studies revealed that AIANs had significantly higher rates of suicide, including ideation and attempts, in comparison with non-AIANs (Parker et al., 2019; see also Qiao & Bell, 2017; Stanley et al., 2020; Subica & Wu, 2018; Wexler et al., 2012; Zamora-Kapoor et al., 2016). While this finding is not novel to the literature, at times it remained the focus of articles published during the past decade. The methodologies employed across the 72 studies varied widely, thus making it difficult to build on previous work to further broaden scientific understanding of this critical issue. In the analyses to follow, comparisons between key components of the research designs and methodologies used in the current corpus are explored and described.

## Sampling Strategies

Table 1 provides a brief overview of the samples, settings, and data sets used throughout the corpus. The sample size of AIAN participants across studies ranged from 1 to 18,083 with a median of 131 participants. During the past decade of research, there was an evident lack of focus on urban AIAN populations; within the corpus, only four studies focused specifically on urban AIANs (Evans-Campbell et al., 2012; see also Manzo et al., 2020; Peters et al., 2019; Rieckmann et al., 2012). Another notable gap concerned the impact of age on AIAN suicide. Twenty-five studies failed to report any data (e.g., range, mean) regarding the age of participants. In the remaining 47 studies, ages ranged from <1 to 82 years of age. While the scope of the current SR did not target research examining Native Hawaiians, three studies included Native Hawaiians in addition to AIAN participants.

## Research Designs

Four themes emerged in the current corpus that described the type of contribution studies sought to make to the literature: (a) identify risk or protective factors for AIAN suicide, (b) report the prevalence of AIAN suicide, (c) describe the implementation of a preventive intervention effort for AIAN suicide, or (d) modify concepts or theories about AIAN suicide. Sixteen studies (22.2%) in the current corpus had more than one primary aim. Out of the four types of contributions, more than half of the studies had at least one primary aim to identify risk or protective factors for suicide ($n = 40$; 55.6%). Twenty-six (36.1%) aimed to describe the prevalence of suicide. Seven (9.7%) studies described an intervention or prevention effort for suicide, and 15 (20.8%) sought to deepen our theory or conceptualization for suicide.

**Table 1**
*Methodological Characteristics of AIAN Suicide Publications (N = 72)*

| Characteristic | *n* | % |
|---|---|---|
| Native American populations | | |
| American Indian | 45 | 62.5 |
| Alaska Native | 6 | 8.3 |
| AI and AN | 21 | 29.2 |
| Method of data analysis | | |
| Quantitative | 62 | 86.1 |
| Qualitative | 7 | 9.7 |
| Mixed-methods | 3 | 4.2 |
| Settings | | |
| School | 26 | 36.1 |
| Community | 16 | 22.2 |
| Clinic/health center | 14 | 19.4 |
| Geography | | |
| Reservation/Tribal | 23 | 31.9 |
| Urban | 4 | 5.6 |
| Data sets | | |
| YRBS | 7 | 9.7 |
| Add Health | 4 | 5.6 |
| NM-YRSS | 3 | 4.2 |
| Mortality | 6 | 8.3 |

*Note.* Some studies examined more than one Native population, so totals may not sum to 72. Percentages may not add up to 100% due to rounding. AIAN = American Indians and Alaska Native; AI = American Indian; AN = Alaska Native; YRBS = youth risk behavior survey (Center for Disease Control & Prevention, n.d.); Add Health = The National Longitudinal Study of Adolescent to Adult Health (Harris et al., 2009); NM-YRSS = New Mexico Youth Risk and Resilience Survey (Green et al., 2006).

Sixty-two out of 72 articles employed a quantitative research design. Statistical analyses used across the studies included bivariate analyses such as *t* tests or chi-squares ($n = 27$) and correlations ($n = 8$), and multivariate analyses such as analysis of variance or regressions ($n = 28$). A large subset of studies in the corpus only provided descriptive statistics ($n = 26$), thus limiting the ability to identify meaningful correlates or predictors of AIAN suicide. Only 14 studies accounted for potential covariates in their statistical analyses, with the most common being age, sex, and education of the participant or their parent(s). A total of 14 studies (19.4%) had a primary focus other than suicide in the current corpus.

Seven studies utilized qualitative research designs and three employed a mixed-method approach (Bell et al., 2014; see also DeCou et al., 2013; De Schweinitz et al., 2017; Gray & Muehlenkamp, 2010; Keller et al., 2019; Kohrt et al., 2017; Le & Gobert, 2015; Olson et al., 2011; Shaw et al., 2019; Tingey et al., 2014). Of the qualitative studies, select methodologies included thematic analysis, textual analysis, and case studies. Most of the studies in the corpus were cross sectional ($n = 61$). Eleven longitudinal studies were identified in the search, of which one completed secondary analyses on The National Longitudinal Study of Adolescent to Adult Health data (Add Health; Laster Pirtle & Brown, 2016). Another four were studies conducted through the collaboration between researchers at Johns Hopkins University and the White Mountain Apache Tribe (Cwik et al., 2014, 2016a, 2016b; see also Tingey et al., 2014).

## Suicide Assessment

Throughout the literature, suicide was assessed through three primary methods. Seventeen (23.6%) studies examined suicide through a researcher-defined question such as, "Have you ever attempted suicide?" (Albright et al., 2020; see also Harman, 2017; Ivanich & Teasdale, 2018; Turanovic & Pratt, 2017). Eleven (15.3%) studies assessed suicide attempts or death through examination of medical records or mortality reports. Only 28 (38.9%) of the articles used a previously validated questionnaire to assess the suicide variable. Among those that used a validated measure, a number of different questionnaires were used to assess suicidality. Notably, many of the questionnaires used to assess suicide throughout the literature have not been previously validated for use with AIANs (see Table 2).

## Suicide Risk and Protective Factors

Throughout the literature, there is considerable heterogeneity among the factors examined in relation to suicide. The most frequently examined variables within this literature are depression ($n = 22$; 8.0%), substance use ($n = 20$; 7.7%), biological sex ($n = 19$; 7.3%), and alcohol use ($n = 18$; 6.9%). However, a total of 104 unique variables were identified across the corpus that were studied in relation to suicide, with more than half ($n = 62$) being measured in only a single study. Given the large number of variables within the literature, it is difficult to assess the most prominent risk or protective factors for AIAN suicide (Wiglesworth et al., 2021; see also Fetter et al., 2022). Notably, in the past decade of research, there has been

**Table 2**
*Validated Questionnaires Utilized in AIAN Suicide Research During 2010–2020*

| Name of Questionnaire | Suicide variable assessed (SI/SA) | Studies that used measure *N* | Validated for these populations (Y/N) | Studies |
|---|---|---|---|---|
| Suicidal Ideation Questionnaire/Suicidal Ideation Questionnaire-Junior | SI | 8 | Yes | Arnold et al. (2013); Bell et al. (2014); Cwik et al. (2015); Cwik et al. (2016a); Hill et al. (2020); Kelley et al. (2018); Peters et al. (2019); Tingey et al. (2014) |
| Hopelessness Depression Symptom Questionnaire-Suicidality subscale | SI | 5 | Yes | Cole et al. (2013); Cole et al. (2020); O'Keefe and Wingate (2013); O'Keefe et al. (2014); Tucker et al. (2016) |
| The Patient Health Questionnaire-9 | SI | 1 | Yes | Le and Gobert (2015) |
| Suicidal Behaviors Questionnaire-Revised | SI/SA | 1 | Yes | Stanley et al. (2020) |
| Columbia Suicide-Severity Rating Scale | SI/SA | 1 | No | Cwik et al. (2015) |
| Suicide Intent Scale | SA | 1 | No | Cwik et al. (2015) |
| The Suicide Probability Scale | SI | 1 | No | Kohrt et al. (2017) |
| The suicide status form | SI | 1 | No | Kohrt et al. (2017) |
| Addiction severity index-native American version | SI/SA | 1 | No | Kropp et al. (2013) |
| Suicidality module of the M.I.N.I. | SI/SA | 1 | No | Parker et al. (2019) |
| Addiction severity index | SI/SA | 1 | No | Rieckmann et al. (2012) |
| The Suicidal Risk Questionnaire | SI/SA | 1 | No | Scheel et al. (2011) |
| Self-injurious thoughts and behaviors interview-short form | SA | 1 | No | Stanley et al. (2020) |

*Note*. Author devised questionnaires which have not been validated in the literature were excluded from the table. Questionnaires that assessed protective factors or reasons for living were excluded. AIAN = American Indians and Alaska Native; SI = suicidal ideation; SA = suicide attempt; Y = Yes; N = No;

minimal focus on Tribal cultural factors that impact AIAN suicide. Some examples that were observed in the current analysis included examining cultural commitment, awareness of Tribal traditional beliefs about suicide, spirituality, historical loss thinking, maintenance of traditional practices, and cultural health/values as risk and/or protective factors for suicide (Gray & Muehlenkamp, 2010; see also Scheel et al., 2011; Tucker et al., 2016). However, most of these variables were examined in a single study and within a specific Tribal community, hence limiting the generalizability to other AIANs. For a more detailed discussion of the risk and protective factors for suicide in AIANs, please refer to our related papers (Fetter et al., 2022; see also Wiglesworth et al., 2021).

## Community Engagement

A notable difference was observed in the corpus between studies that were initiated and driven by an AIAN community in contrast to studies designed and led by research teams. Those led by AIAN communities included studies whose methodologies were designed by the Tribal Nation, included heavy community input (e.g., advisory boards, elder input, and Tribal council oversight), and positioned the AIAN community as the primary stakeholder. Twenty-six (36.1%) of the publications in the current corpus described ongoing projects or individual studies that were approved or administered by a Tribal community, and 15 (20.8%) described utilizing a participatory research method. Most often this was defined as the Tribal Nation or community being involved in research questions, design, implementation, evaluation, or dissemination of results (Bell et al., 2014; see also Tingey et al., 2014). Of the 26 publications that were Tribally administered or approved, 11 were written about research partnerships with the White Mountain Apache Tribe and two were written about studies conducted with the Lumbee Tribe. When examining the projects that involved direct initiative, design, and involvement of a Tribal Nation in the research, seven publications came out of the White Mountain Apache and Johns Hopkins University partnership (Cwik et al., 2011 see also Cwik et al., 2015, 2016a, 2016b, 2018; Haroz et al., 2020; Tingey et al., 2014).

Analysis of this partnership highlighted the potential benefits when Tribal Nations engage in collaborative efforts with researchers to solve pressing public health concerns within their own community. Through this partnership, a community-based suicide surveillance system and prevention effort known as the *Celebrating Life* program was developed (Cwik et al., 2014). No other programs of this nature targeting suicide were identified in the literature over the last 10 years. Several significant impacts of this partnership were noted, including a reduction in suicide attempts and deaths for White Mountain Apache youth and adults (Cwik et al., 2016b). Out of all the articles using participatory methodologies, community-based participatory research was the most frequently cited methodological framework (Bell et al., 2014; see also De Schweinitz et al., 2017; Parker et al., 2019). Despite the benefits found in the current analysis from collaborative partnerships between Tribal Nations and researchers, a majority of studies ($n$ = 57) in the corpus did not use community-based or other participatory approaches.

## LGBTQ+ and Two-Spirit Samples

Only two (2.8%) studies explicitly assessed for the gender identity of the participants (Albright et al., 2020; Evans-Campbell et al., 2012). Evans-Campbell and colleagues sampled for AIAN and First Nations two-spirit participants (i.e., a term used to describe Indigenous peoples who mix, cross, or combine sex- or gender-based qualities or roles; Roscoe, 2019), including those who

self-identified as, "gay, lesbian, bisexual, transgender, or two-spirit or having engaged in same-sex sexual behavior in the past 12 months." This study did not include a heterosexual comparison group, as the focus was on comparing the differences between boarding school attendees and nonattendees (Evans-Campbell et al., 2012). Importantly, the question selected by the authors in this study blurs the line between gender identity and sexual orientation. This may not align with AIAN ways of being, as AIAN Tribal groups have been known to accommodate more than three genders and normalize fluidity and individual variance in terms of sexual orientation and gender (Roscoe, 2019). In the second study, Albright et al. (2020) assessed the gender identity of AIAN participants by including three gender options: Male, female, and transgender. However, they did not report any results on suicide and gender identity due to the low number of participants who identified as transgender in their sample. Twenty-eight (38.9%) of the articles in the total corpus did not include any gender and/or sex data of participants. As a result, no conclusions can be drawn about two-spirit or Lesbian, gay, bisexual, transgender, and queer/questioning (LGBTQ)+ suicide within the past 10 years.

## Tribal Nations Studied

Analysis of the data revealed that there are large gaps in knowledge pertaining to specific Tribal Nations and geographical regions in the literature. In the current corpus, there was no uniformity between studies regarding their methodology of inquiring about a participants' race (e.g., AIAN), nationality (e.g., specific Tribal Nation—Eastern Band of Cherokee), or ethnicity (e.g., Cherokee). There was also a lack of uniformity on how this information was reported throughout the studies. Many studies opted to only capture data on the broader racial categories of AIAN through self-identification; this was especially prominent in the epidemiological studies. Out of the 72 studies, 58.3% did not indicate any data on which specific Tribal Nation(s) or geographic regions were represented in their sample. This may be due to guidelines set forth that aim to protect Tribal Nations from the potentially harmful impacts of research and uphold the Tribal Nations right to confidentiality (Norton & Manson, 1996). Of the studies that reported gathering data regarding the specific nationality of participants, some articles named all Tribal Nations represented in the sample, while others chose to protect the identity of the Tribe and/or participants by only indicating the region (Bolton et al., 2014).

Some Tribal Nations were represented more frequently in the current corpus due to ongoing collaborative research projects being conducted within their communities (e.g., White Mountain Apache). A breakdown of geographic regions represented in the current corpus can be seen in Figure 2. Notably, the Tribes described in the current corpus represent only a small fraction of the total number of Tribal Nations within the U.S. Consequently, research published during the past decade provides an incomplete portrait of AIAN suicide, with most communities being omitted entirely from the literature. Past literature has demonstrated that the specific needs and concerns related to suicide can vary widely between AIAN communities, in part, due to the cultural heterogeneity of Tribal Nations (Bolton et al., 2014).

## Summary

The state of the research as reviewed here highlights the heterogeneity among research methods and approaches in the study of AIAN suicide. Over the past 10 years, there was a clear emphasis on quantitative methodologies and exploring a wide variety of potential risk/protective factors for suicide in AIANs. However, the variability in selected methodologies makes it impossible to compare and draw conclusions from the literature in a robust manner. Furthermore, many studies in the past decade analyzed large, publicly available epidemiological data sets gathered by federal agencies such as the Centers for Disease Control and Prevention rather than collecting original data. Those studies that designed their own questionnaires and collected original data contributed interesting findings, though nonreplicated methodologies hinder the prospects for knowledge to accrue over time. Overall, our analysis revealed that very little is known to date about the particular contours of AIAN suicide and greater methodological uniformity is needed across the literature to better understand this phenomenon. Some important data are absent from the literature, such as findings about urban, two-spirit or LGBTQ+ AIAN suicide, and AIAN suicide clusters. However, this corpus demonstrated that targeted research collaborations utilizing community-based or other participatory approaches show exceptional promise for contributing to the field. When Tribal Nations have made suicide research a priority and sought meaningful research partnerships, significant positive impacts were observed (Cwik et al., 2016b).

# Discussion

Results of the current review revealed an absence of general, best methodological practices for conducting suicide research with AIANs, which has led to difficulty in knowledge accruing over the last decade. This demonstrates a need to develop more precise theories to guide scientific inquiry into AIAN suicide to continue building knowledge about this crisis. Wexler et al. (2015) offered several important recommendations for the future of AIAN suicide intervention research. These recommendations included the promotion of descriptive studies utilizing both qualitative and mixed-method approaches as well as the entry into collaborative relationships for future suicide research with AIANs. We agree with the recommendations set out by Wexler et al. (2015) and propose an additional set of methodologically focused recommendations to guide future research on AIAN suicide based on the findings of the current review.

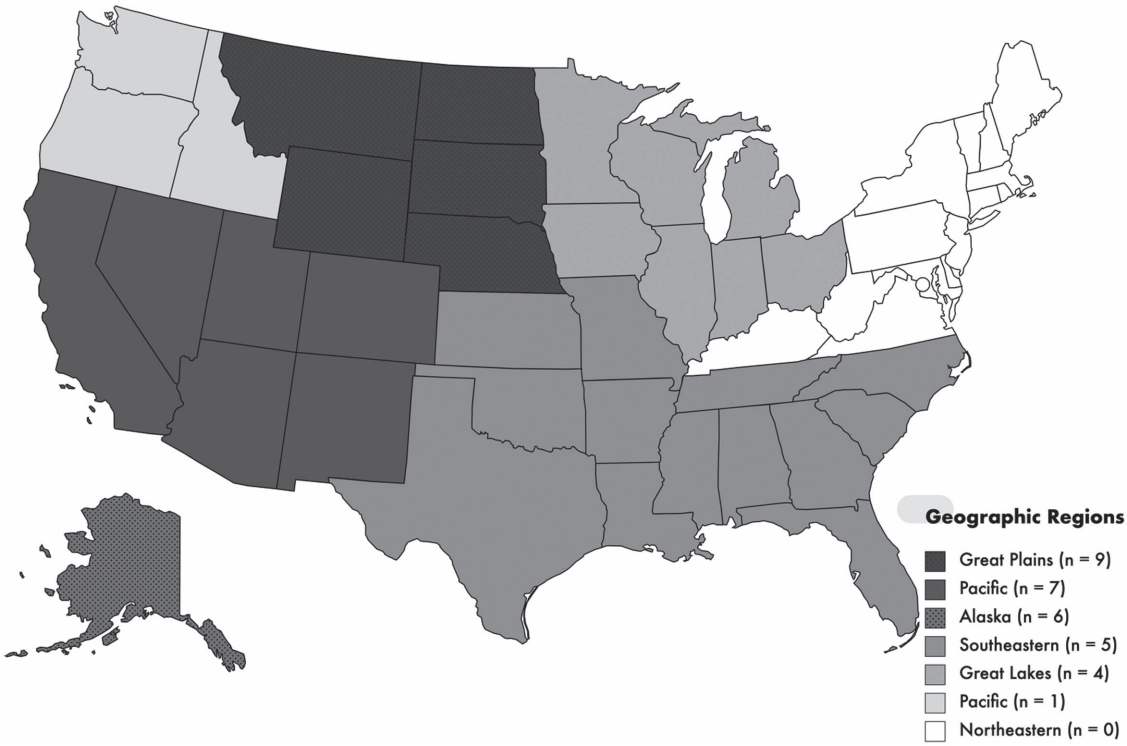
Importantly, our review revealed a need to engage flexibly in scientific inquiry, taking into consideration the specific needs of a given AIAN community and how these best practices may or may not serve the community due to the marked heterogeneity of how suicide impacts AIAN peoples. There is a need to strike a balance between both methodological rigor and tailoring approaches to the specific needs of the AIAN Tribal Nation—at times, these may come in conflict with one another. The following recommendations were designed to uphold a general standard for rigorous methodological inquiry, though they are meant to serve only as guidance rather than rules. Researchers should consider each of the following recommendations in the context of the specific needs, concerns, and values of the AIAN Tribal Nation with which they are partnering (Gone, in press). Each of these recommendations is intended to be applied flexibly, ultimately ensuring that Tribal sovereignty is upheld and honored throughout the research process. In subsequent sections, we discuss each of these recommendations in turn.

## Standardization of Suicide Assessment

Throughout this literature, there was variability in how researchers assessed AIAN suicide. Several studies assessed suicide through

**Figure 2**

*Geographic Regions Where Suicide Research Is Being Conducted*




*Note*. Tribal regions represented as unique research projects in the current corpus. Pacific (e.g., Yakama Tribe; $n = 1$ studies), Southwestern (e.g., Navajo, White Mountain Apache; $n = 7$ studies), Great Plains (e.g., Cheyenne, Cree, Kiowa, Ojibwe, Omaha, Osage, and Potawatomi; $n = 9$ studies), Great Lakes (e.g., Dakota, Ho-Chunk, Lakota, and Potawatomi; $n = 4$ studies), and Southeastern (e.g., Cherokee, Chickasaw, Choctaw, Comanche, Creek, Delaware Seminole, and Shawnee; $n = 5$ studies) regions of the United States.

researcher-derived questions, while others utilized previously validated questionnaires to assess suicidality (Albright et al., 2020; see also Bell et al., 2014; Harman, 2017). The questionnaires used throughout the corpus quantify suicidal ideation and behavior in a variety of ways, thus making it impossible to compare data across studies. There may also be underlying issues concerning the validity of the selected measures for AIANs. Hill et al. (2020) found that adaptations may be necessary to improve the psychometric properties of suicide questionnaires with AI youth. They noted that questions regarding thoughts of death may not account for the fact that thinking about death, dying, or the spirit world may not only be viewed positively by some AIANs, but that they may also be central to traditional belief systems (Hill et al., 2020). As a result, the construct validity of specific items on suicide questionnaires that have been validated for use with the general population may not be as robust for AIANs, thus limiting the conclusions that can be drawn about suicide within these populations.

Research by Hill et al. (2020) highlighted several important considerations that researchers need to make when selecting a questionnaire for use with AIANs. As few suicide-related questionnaires have been validated for use with AIANs, researchers should pay special attention to the type of measurement selected to assess suicide in these populations. The Suicide Ideation Questionnaire (SIQ) is a tool that has been previously validated for use with adolescent and adult AIANs and may be a good choice for future research (Keane et al., 1996). Furthermore, some research has emerged during the past decade that examined the validity of a strengths-based approach for assessing AIAN health. Kropp et al. (2013) developed the *Wicozani* Instrument, a new measure for Indigenous health and well-being based on traditional Dakota epistemologies. Preliminary findings suggested that the *Wicozani* Instrument had strong convergent validity with the SIQ and that it may be able to identify AIAN youth who are at risk for suicidal ideation (Kropp et al., 2013). Future researchers should seek to further examine the *Wicozani* Instrument as an alternative for assessing suicide risk in AIANs from a variety of Tribal Nations. In pursuance of a more robust literature, we recommend that researchers prioritize suicide assessment measures that have been validated for use with AIANs when possible: The Suicidal Ideation Questionnaire, the Hopelessness Depression Symptom Questionnaire-Suicidality subscale, The Patient Health Questionnaire-9, or the Suicidal Behaviors Questionnaire-Revised version.

## Research Partnerships

There are several unique challenges to conducting suicide research in AIAN communities. One of these challenges is the longstanding mistrust of research that developed from decades of unethical and harmful research practices with AIANs by non-Indigenous researchers (Institute of Medicine and National

Research Council, 1996; see also Van Assche et al., 2013). Although AIAN communities can potentially benefit from ethical and collaborative research partnerships, Tribal Nations are understandably hesitant to engage in research collaborations (Gone, in press). Tribal IRBs serve to protect Tribal Nations from unethical research practices and to streamline collaborative research processes toward greater relevance by allowing tribes to oversee and approve the research being conducted based on their own identified standards. However, receiving Tribal approval is only one step in utilizing participatory methodologies in research with AIANs. Two examples in the suicide literature demonstrated the difference between standard participatory methodologies compared to research partnerships that develop when Tribal Nations are actively involved in the development of collaborations to address the unique needs of their community.

The research partnership between the White Mountain Apache Tribe and Johns Hopkins University is an example of a Tribal Nation seeking out a research collaboration to address the high suicide rates in their community (Cwik et al., 2016a; see also Cwik et al., 2016b). For over 20 years, the White Mountain Apache Tribe has maintained their research partnership with Johns Hopkins University and has insisted on being actively involved in each stage of the research process to ensure that their own research sovereignty is upheld (Tingey et al., 2014). Notable benefits of this partnership have appeared in the literature, including lowered suicide rates in their community (Cwik et al., 2016b). In addition, the Lumbee Tribe had an academic-community partnership with the Wake Forest School of Medicine for suicide prevention known as the Lumbee Rite of Passage (Langdon et al., 2016). This collaboration revealed the importance of deeper Tribal engagement in which Tribal Nations are directly and actively involved in all stages of the research project (Langdon et al., 2016).

There is a crucial need for additional collaborative research partnerships of this kind if AIAN suicide is to be effectively understood and remedied. We recommend that academic institutions and research teams take an active approach to demonstrate their enthusiasm and willingness to engage in ethical and collaborative efforts with local Tribal Nations through outreach and invitations to local Tribal leaders to discuss potential partnerships. We further urge researchers to refrain from placing their values and expectations of community needs on Tribal communities when entering these collaborative conversations, and instead view their role as facilitators of community-driven research and action. Finally, Tribal Nations may consider drawing on these past examples of successful collaborative research partnerships for insights into how they might exercise their Tribal Sovereignty in research processes and protocols.

## Interdisciplinary Collaboration With Suicidologists

Another challenge of conducting research on AIAN suicide is the relatively low sample sizes and fluctuations in rates of suicidal behavior over time (Major et al., 2018). While the overall rate of AIAN suicide is significantly elevated compared to other racial/ethnic groups, specific rates among the more than 570 Tribes in the U.S. vary widely (Bolton et al., 2014). Researchers may also have difficulty recruiting AIAN participants for suicide-based research due to the cultural stigma toward suicide experienced in some communities (Langdon et al., 2016). This may lead some researchers to feel ill-equipped to undertake specific, suicide-related inquiries with AIANs and thus leave suicide-related variables out of their studies.

Interestingly, several studies in the current corpus were not specifically focused on suicidality as the primary area of interest, but rather assessed suicidality (e.g., suicidal ideation, attempts, or deaths) among other variables of interest (Legha et al., 2020; see also Rieckmann et al., 2012). This demonstrated a unique way to capture data on AIAN suicide that might otherwise be omitted from the literature. To build collective knowledge on AIAN suicide, there is a critical need for more interdisciplinary collaborations between researchers who are interested broadly in AIAN mental health disparities (e.g., substance use and anxiety) and suicidologists who are particularly interested in the suicide crisis in AIAN communities. Such collaborations could be particularly meaningful with researchers in the field of public health research, medicine, or other behavioral health disciplines. If researchers working with AIANs feel ill-equipped to include suicidality as a variable of interest within their studies, we recommend as standard practice that researchers adopt a proactive approach and seek out collaborations with AIAN suicidologists who can contribute this important expertise to the research team.

The current research demonstrates that AIANs have significantly elevated levels of suicidality, which are likely present even when not specifically assessing for it in a research sample (Center for Disease Control and Prevention, 2010). Thus, by actively including suicidologists in multidisciplinary collaborations, we can begin to address this pressing issue and build new insights into this difficult area of research. Furthermore, it is important that all findings related to suicide are accurately and consistently disseminated to better understand the nuances of this phenomenon. We recommend that all researchers who include a suicide-related variable in their research with AIANs include a brief description of these findings in subsequent publications or reports even when these constitute (adequately powered) nonsignificant findings. This will help the field to increase our body of knowledge and inform future areas of inquiry.

## Gaps in the Literature

Four specific gaps in the literature emerged from the current review. First, research including two-spirit and LGBTQ+ AIANs during the past decade was scarce, with no studies explicitly examining the impact of holding these marginalized identities on suicide ideation or behaviors. Only two studies in the current review assessed for the gender identity or sexual orientation of the participants (Evans-Campbell et al., 2012; see also Albright et al., 2020). This is notable, as the broader literature around LGBTQ+ individuals in the general population demonstrates that they experience significantly higher rates of suicidal thoughts, behaviors, and death compared to non-LGBTQ+ individuals (Ream, 2019). Particularly, data from The Trevor Project (2019) indicated that AIAN LGBTQ youth are 2.5 times more likely to make a suicide attempt than White LGBTQ youth, making this a particularly concerning gap in the current literature. In building our understanding of suicide in AIAN peoples, we recommend that future researchers include nonbinary gender options and assess the sexual orientation of AIAN participants separately. This aligns with conducting culturally grounded research which makes space for Indigenous ways of knowing and

will help us to better understand who is at highest risk for suicide within AIANs communities.

Second, research specifically focused on urban AIAN communities was lacking in the current corpus. Only four studies during the past 10 years sought to examine suicide in urban AIANs. Evans-Campbell et al. (2012) found that urban AIANs who had formerly attended boarding school were significantly more likely to have suicidal thoughts and to have a history of suicide attempts than nonattendees. Prior evidence suggests that the risk factors for suicidality in urban AIANs differ from those who live or grew up in a rural setting or on a reservation (Freedenthal & Stiffman, 2004; Manzo et al., 2020). Importantly, there are more than 1.5 million urban AIANs, with some of the largest populations in the metropolitan areas of Phoenix–Mesa–Scottsdale, Tulsa, Los Angeles–Long Beach–Anaheim, and Oklahoma City (Center for Disease Control and Prevention, 2018). Urban AIANs face unique barriers to care due to a lack of visibility, resources, and uniform policy concerning urban AIAN health (Urban Indian Health Commission, 2007). Thus, we recommend that future researchers seek to engage in robust research with urban AIANs to understand the unique risk or protective factors for suicidality in urban settings.

Third, there were interesting findings in the current corpus about multiracial AIANs (i.e., AIANs who also identify as having ancestry from another ethnoracial group). One study indicated that multiracial AIANs are at higher risk for suicide than monoracial AIANs, though no other studies in the literature collected information or disseminated results on multiracial AIAN identity and suicide (Parker et al., 2019). This is a particularly important area of future inquiry, considering that the 2010 U.S. Census indicated that there are at least 1.4 million individuals who identify as AIAN and White (Jones & Bullock, 2012). Another study found that being inconsistently racially classified as AIAN by an interviewer may be related to increased suicidal ideation, though this was not explored in other research (Laster Pirtle & Brown, 2016). Considering the above studies were the only ones to explore racial identity and/or classification with respect to suicide risk, we recommend that future researchers continue to explore this vital area. Researchers may consider collecting data on multiracial AIANs more routinely and running statistical comparisons to those who identify solely as AIAN, so that we can better understand the unique risk factors present for multiracial AIANs.

Finally, there is a lack of data on AIAN suicide clusters in the current literature. Research by the Substance Abuse and Mental Health Services Administration found only two published research articles on suicide clusters within AIAN communities, and each was published prior to 2010 (Substance Abuse and Mental Health Services Administration [SAMHSA], 2017). Suicide clusters may be particularly hard to study systematically due to their unpredictable emergence and their elevated occurrence in rural, close-knit Tribal communities (SAMHSA, 2017). However, future researchers should consider the implications and importance of finding strategic ways to study these events to build our understanding of the causes, risk, and/or protective factors for suicide clusters in AIAN communities.

## Conclusion

This review examined the state of AIAN suicide research conducted during the past 10 years. Findings revealed that methodological approaches vary widely across studies and that new knowledge about the suicide crisis affecting AIAN peoples has rarely appeared. In developing a fuller understanding of the problem of AIAN suicide through future research, we suggested several, flexible recommendations that will increase our collective knowledge of AIAN suicide. One recommendation is the need to standardize suicide assessment methods, thus paving the way for future cross-study comparisons. A second recommendation is that future researchers should take a proactive approach by seeking out more interdisciplinary collaborations with suicidologists, thus increasing the original data collected on AIAN suicide. A third recommendation is a crucial call for Academic Institutions and research teams to explicitly demonstrate their interest in meaningful collaborations with Tribal Nations and commitment to upholding Tribal sovereignty through the research process; as well as for Tribal Nations to consider how these partnerships can serve their communities and demonstrate an openness to discuss such partnerships with institutions who have made clear their interest and efforts to position Tribal Nations as key members of the research process. Our final recommendation is to increase our focus on addressing specific gaps that persist in the current literature including the lack of data on specific, vulnerable AIAN subgroups such as urban, two spirit or LGBTQ+, and multiracial AIANs and suicide clusters. We are hopeful that the next decade of research will reveal more vigorous knowledge that can assist us in addressing the crisis of AIAN suicide.

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