

# Alcohol consumption and pregnancy in American Indian and Alaska Native women: A scoping review of the literature

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## Abstract

American Indian and Alaska Native communities have diverse cultures, histories, and contemporary experiences. Grouping them together masks the differences in health and lifestyle behaviors, chronic disease rates, and health outcomes among them. This is particularly true for data on drinking during pregnancy among American Indian and Alaska Native women. The goal of this article is to describe how generalizing findings from data gathered from often small, geographically specific samples, combined with inferior research methodologies, has led to misunderstandings about drinking among preconceptual and pregnant American Indian and Alaska Native women. We conducted a scoping review using PubMed and the “PCC mnemonic” (population, concept, and context) as our guide. Our search terms included the population (American Indian and Alaska Native women), concept (alcohol), and context (immediately before or during pregnancy) and focused on PubMed articles in the United States. Using these search terms, we uncovered a total of 38 publications and eliminated 19, leaving 19 for review. Methodologically (i.e. how data were collected), we found most previous research on prenatal or preconceptual alcohol use with American Indian and Alaska Native women used retrospective data collection. We also assessed who data were collected from and noted two groups: studies that sampled higher-risk women and those that focused on American Indian and Alaska Native women in specific geographic areas. Restricting data collection to higher-risk American Indian and Alaska Native women or conducting small studies in specific geographic areas has generated an incomplete and inaccurate picture of American Indian and Alaska Native women as a whole as well as those who consume alcohol. Data from select groups of American Indian and Alaska Native women may overestimate the true prevalence of drinking during pregnancy among this population. Updated and accurate data on drinking during pregnancy are urgently needed to inform the development of interventions and prevention efforts.

## Keywords

alcohol, American Indian/Alaska Native, pregnancy, scoping review, women

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## Introduction

More than 570 American Indian and Alaska Native (AIAN) Tribes have been federally recognized in the United States. Located in 36 states in both urban and rural locations, Native nations have diverse cultures, languages, contemporary experiences, and histories.<sup>1</sup> Adding to this diversity are state recognized Tribes, Tribes without federal or state recognition, and urban AIAN communities. Grouping these diverse communities into a single AIAN population,

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especially in national studies, masks important differences in health outcomes among them.<sup>2</sup> For example, movement of individuals between urban and rural areas—known as circular migration or residential mobility—can result in incomplete data, particularly in longitudinal research, where study designs might not adequately capture differences in characteristics that vary substantially in urban and rural settings.<sup>3</sup> In addition, centuries of federal policy aimed at the destruction of the AIAN population through land and resource theft and forced assimilation into the broader US population has led, understandably so, to mistrust of the government, resulting in a lack of interest in or willingness to participate in research.<sup>4</sup> National statistics for the AIAN population are, as a consequence, often incomplete or inaccurate.

This lack of comprehensive data is particularly true for assessing drinking in AIAN communities. The historical context is fraught with misconceptions that must be understood when assessing research and statistics on drinking among AIAN people. Prior to colonization by European settlers, AIAN people had virtually no experience with alcohol consumption.<sup>5</sup> When alcohol was introduced by European colonists, AIAN Tribes had little time to develop social, legal conventions, or guidelines, as early traders quickly established a demand for alcohol by introducing it as a medium of trade.<sup>6</sup> This deliberate and strategic use of alcohol for trade was eventually used as a “tool of diplomacy” in official dealings between the United States and Native nations and eventually as “a bargaining chip in the appropriation of traditional land holdings.”<sup>7</sup> Once alcohol was introduced, “transient foreigners” were the only models of drinking behaviors for AIAN communities, which was problematic as excessive drinking was pervasive among the early European colonists.<sup>7</sup> Soon after, stereotypes on excessive alcohol consumption among AIAN people emerged.

These stereotypes included a belief that biological differences were responsible for making AIAN people more prone to alcohol problems.<sup>8</sup> This so-called “firewater myth” posited that “some hereditary peculiarity makes it impossible for Indians to drink without disastrous consequences.”<sup>9</sup> This notion of a biological or genetic propensity for alcohol problems among AIAN people continues today,<sup>10</sup> without a scientific basis but with serious consequences such as stereotyping, stigma, and discrimination.<sup>10–12</sup> The “firewater myth” in part led to the passing of a federal law in 1832 that prohibited the sale of liquor to all AIAN people.<sup>8</sup> This federal law was not rescinded until the early 1950s. Moreover, belief in biological vulnerabilities to alcohol has been associated with increased alcohol consumption, frequency of heavy drinking, and alcohol consequences among AIAN college students<sup>10</sup> and greater drinking days among reservation dwellers.<sup>12</sup> The firewater myth highlights the power of negative stereotypes on actual behaviors.

Harmful stereotypes regarding drinking patterns with AIAN people evolved from alcohol research itself. A well-known example is the 1979 Barrow Alaska Study, which began with a community request to understand substance use and substance use treatment.<sup>13,14</sup> To meet this need, university-based sociological researchers distributed a cross-sectional, multi-variable survey to Alaska Native adults in Barrow. The study found that 41% of the population considered themselves to be excessive drinkers, 60% felt badly about the consequences of their drinking, and more than half reported that drinking ultimately created severe problems with their family and spouse.<sup>13,14</sup> One quarter were abstainers, and drinking in this community was described primarily as a social event.<sup>13,14</sup> Ultimately, the study results were disseminated at a public Tribal meeting in Barrow and through a press release. Because of the press release, *The New York Times* ran a front-page article titled, “Alcohol Plagues Eskimos,” and the United Press International Wire Services distributed a press release announcing, “What we have Here is a Society of Alcoholics.”

In 1981, a formal statement made by the director of public health from Barrow at the Fifth International Symposium on Circumpolar Health in Copenhagen, Denmark condemned both the study and the news reports, stating, “The release of the questionable results of the study to a nationwide news source prior to informing the studied community is a classic example of researchers utilizing Indigenous people as so many laboratory specimens.”<sup>15</sup> We offer the firewater myth and the Barrow Alcohol Study as examples of how alcohol policies and research have perpetuated stereotypes about drinking among AIANs. Contrary to these stereotypes, several rigorous studies document that drinking patterns among AIAN and White groups are similar<sup>16–20</sup> and that consequences of excessive drinking, such as fetal alcohol syndrome, are not significantly higher in AIAN than non-AIAN groups.<sup>21,22</sup>

The goal of this review is to describe, through examination of publications on drinking during the preconceptual and prenatal period, how data from small, geographically specific sample sizes and suboptimal research methodologies have led to misconceptions regarding alcohol consumption among AIAN populations. In particular, inaccurate data have reinforced historical stereotypes about AIAN people and alcohol use, while broader sociocultural and historical factors that may be related to alcohol use have been neglected.<sup>23,24</sup> We conducted a scoping review since they are useful for examining emerging evidence or when the specific areas to address in a systematic review are unclear.<sup>25,26</sup> Scoping reviews are recommended for examining how research is conducted on a certain topic over time, such as alcohol research with AIAN women, to summarize the evidence, and to identify knowledge gaps.<sup>26,27</sup> As noted by others, scoping reviews are “particularly helpful when the

literature is complex and heterogenous,”<sup>27</sup> as we believe it is with AIAN communities, which are highly diverse with respect to geography and cultural. This scoping review synthesizes the research literature on drinking among AIAN women before and during pregnancy and makes the case that inaccuracies about alcohol use are especially evident for pregnant AIAN women.

## Methods

In this review, we investigate the impact of how alcohol research has historically been conducted and its impact on our collective understanding of AIAN women’s alcohol use. We used PubMed to conduct the scoping review, using the “PCC mnemonic” as our guide, per methodological recommendations on scoping reviews.<sup>27</sup> Our research terms—the inclusion criteria for the scoping review—included the population (AIAN women), concept (alcohol), and context (immediately before or during pregnancy). We included research articles focused on AIAN women in the United States rather than general samples of AIAN men and women or global Indigenous communities. We included research from US national samples in the Results section to compare data on AIAN women.

As a review of the existing literature, neither institutional review or other ethics board approval nor informed consent was required for publication. No data were shared per standard data practices.

## Results

Using the search terms “American Indian Alaska Native, women, alcohol” in PubMed, we identified 38 publications. We eliminated 10 that were not focused on women, did not include references to pregnancy or the preconception period in the abstract, or did not include alcohol consumption behaviors, yielding 28 publications to read, summarize, and critique. After reading the publications, an additional nine were eliminated because they did not assess drinking behaviors related to pregnancy (i.e. did not collect or include data on actual use) but instead were preliminary reports on interventions developed for AIAN women. Our final review included 19 articles.

Because this was a scoping review, our abstraction focused on the sample population and data collection methods to inform gaps in knowledge. Methodologically (how data were collected), most previous research on prenatal or preconceptual alcohol use among AIAN women relied on retrospective data collection, such as through the Timeline Followback<sup>18–29</sup> or the CAGE screening tools,<sup>30,31</sup> which are used to survey participants about past binge drinking, usually within the last 30 days.<sup>32,33</sup> Some studies collected data through qualitative methods that established the types of alcohol consumed, the number of individuals sharing alcohol, and the timeframe of drinking

episodes.<sup>18,32</sup> Next, we were interested in who data were collected from and determined that the literature comprises two groups: (1) publications that sampled higher-risk AIAN women such as those who previously had or are currently at risk for an alcohol-exposed pregnancy and (2) publications that sampled AIAN women in circumscribed geographic areas and Tribal communities to examine alcohol use. As noted above, we included some data in the Results section below that originated from the literature search for the scoping review; these are presented to compare findings in AIAN women with other general samples of women.

### *Sampling higher-risk participants*

While research often presents AIAN alcohol consumption as widespread or an epidemic, drinking among AIAN women is quite variable,<sup>16–35</sup> with study results depending largely on who data are collected from. Data on drinking rarely emanate from general samples of pregnant or preconceptual AIAN women; more often, data are derived from vulnerable groups, such as women at high risk for an alcohol-exposed pregnancy, with a focus on preventing fetal alcohol syndrome. For example, one study noted that AIAN women from three Great Plains communities who were at risk for an unintended pregnancy consumed an average of 7.0 drinks per occasion and reported a mean of 7.9 binge drinking episodes in the past 90 days.<sup>36</sup> However, data were only collected from preconceptual women who were binge drinking and not from their counterparts who were not binge drinking.

In a study not centered on a high-risk subpopulation, among 661 AIAN women seen at one Indian Health Services prenatal clinic in the Great Plains, 16% consumed alcohol during pregnancy.<sup>37</sup> This figure is similar to national data from the Behavioral Risk Factor Surveillance System survey (2018–2020) that found that almost 14% of pregnant women from all races/ethnicities reported current drinking.<sup>38</sup> A clinic-based study in California that screened all preconceptual AIAN women established 33% were at risk for an alcohol-exposed pregnancy,<sup>39,40</sup> defined as drinking four or more standard drinks per occasion and/or eight or more standard drinks per week and having vaginal intercourse with a man without an effective contraceptive method.<sup>41</sup> While the California study did not include a non-AIAN comparison group, a national study in the United States estimated 75% of women who wanted to get pregnant as soon as possible reported drinking alcohol in the past month, putting them at risk for an alcohol-exposed pregnancy.<sup>42</sup>

The most accurate comparison of prenatal alcohol consumption comes from a cohort study that recruited 2753 (56%) pregnant White women and 2124 (44%) pregnant AIAN women at five sites in North Dakota and South Dakota.<sup>18,29</sup> Data on alcohol consumption (using the

Timeline Followback) and other health behaviors were collected three to four times throughout pregnancy. White women consumed alcoholic beverages during pregnancy more often than AIAN women (63% vs 52%) but AIAN women more often than White pregnant women engaged in binge drinking (41% vs 28%).<sup>18</sup> Most drinking among both races occurred during the first trimester. Compared to their White counterparts, AIAN pregnant women also had a lower risk of drinking in the second and third trimesters and postpartum, but a higher risk of binge drinking in the first trimester.<sup>18</sup>

### ***Sampling in geographic regions***

Variability in drinking among AIAN women before and during pregnancy is also observed within US geographic regions. A study of 125 AIAN women from urban and rural areas near Anchorage reported 35% used alcohol during the first trimester of pregnancy, and 8% consumed alcohol beyond the first trimester.<sup>43</sup> This compares to data on the general US population from the Behavioral Risk Factor Surveillance System, which reported the prevalence of any alcohol use during pregnancy was 10%, and the prevalence of binge drinking was 3%.<sup>44</sup> However, the National Epidemiologic Survey on Alcohol and Related Conditions reported that White women displayed the highest prevalence of binge drinking during pregnancy (21%) and drinking in general (45%) among all racial and ethnic groups.<sup>45</sup> An analysis of the National Survey of Drug Use and Health also concluded that AIAN pregnant women had lower rates of alcohol use compared to other racial and ethnic groups.<sup>19</sup> Regardless of race, excessive drinking during pregnancy often occurs during the first trimester before women find out they are pregnant. Most women stop drinking alcohol when they discover they are pregnant.<sup>46</sup>

Rates of alcohol abstinence were also substantial among AIAN pregnant women,<sup>47</sup> with variation by geographic location. An analysis of data from the National Maternal and Infant Health Survey noted that 20% of pregnant urban AIAN woman reported drinking, although those who did drink consumed on average less than one drink per month.<sup>48</sup> Data collected by the Pregnancy Risk Assessment Monitoring System from five states documented that 89% and 87% of AIAN and White women, respectively, denied drinking alcohol during the last trimester of pregnancy.<sup>20</sup> Another investigation with 559 White and 259 AIAN women from South Dakota reported alcohol consumption in the last 3 months of pregnancy did not significantly differ between the groups (5% and 10%, respectively) after adjusting for demographic characteristics. The authors concluded their findings “challenge commonly held beliefs of elevated alcohol consumption among AIAN compared with other races.”<sup>17</sup> Education, employment, and mental health were all protective against drinking before and during pregnancy in AIAN women.<sup>49,50</sup> One national study

composed of respondents representing diverse races and ethnicities reported that the risk for alcohol-exposed pregnancy did not differ by race and ethnicity but was positively associated with level of education.<sup>42</sup>

In addition, risky drinking prior to pregnancy has been found to influence continued drinking during pregnancy.<sup>51</sup> A survey with 1436 non-pregnant AIAN women aged 16 and older selected at random from the Tribal rolls of four unspecified Tribal sites found that 40% were abstinent from alcohol in the last 12 months.<sup>33</sup> Data from the South Dakota Tribal Pregnancy Risk Assessment Monitoring System estimated that 43% of AIAN women from four states in the Great Plains (North Dakota, South Dakota, Nebraska, and Iowa) reported binge drinking in the 3 months prior to pregnancy.<sup>52</sup> In contrast, a larger study with data from five states (Alaska, New Mexico, Oklahoma, South Dakota, and Washington) observed AIAN women were less likely to report pre-pregnancy alcohol use than White women (56% vs 76%).<sup>20</sup> Finally, data from the American Indian Service Utilization, Psychiatric Epidemiology, Risk and Protective Factors Project produced prevalence estimates of 59%–69% for lifetime abstinence, depending on the age group, among women aged 15–54 living in the Southwest. These statistics compare to a prevalence of lifetime alcohol abstinence of 29%–40% among AIAN women living in the Great Plains and of 36%–47% in the general US population.<sup>34</sup>

### **Conclusion**

Scoping reviews have limitations such as the possibility some relevant studies might have been overlooked.<sup>53</sup> Nonetheless, the publications highlighted in this scoping review suggest data are inadequate to conclude that AIAN women are at higher risk of alcohol use during pregnancy than women in the general US population. In addition, meaningful differences among AIAN communities have been observed regarding alcohol consumption. Limiting data collection to higher-risk AIAN women and conducting small studies in circumscribed geographic areas has led to incomplete and insufficient data on alcohol use during pregnancy among a broader segment of AIAN women. Data from the extant literature on highly selected subgroups or from retrospective or cross-sectional surveys have likely overestimated the true incidence and prevalence of drinking among AIAN women by not including those with no risk.<sup>54</sup> This flawed approach reinforces historical stereotypes about AIAN people and alcohol use, while broader sociocultural and historical influences that may be related to alcohol or substance use have been neglected.<sup>23,24</sup> Future research should correct the shortcomings of the data collected in these ways, acknowledge the harm resulting from flawed methods, and develop rigorous data-driven public health interventions for AIAN women at risk for alcohol overuse.

Future studies might also consider the use of ecological momentary assessment which sends participants frequent

electronic messages and asks them to report behaviors in real time and in their natural environment.<sup>55</sup> Ecological momentary assessment has been used extensively to understand drinking behaviors in the general United States population.<sup>56–64</sup> Data can be collected during risky times—such as evenings or weekends—as well as during non-drinking times to establish patterns and facilitators of drinking and abstinence.<sup>62</sup> Ecological momentary assessment reduces retrospective recall bias and can produce rigorous data on binge drinking patterns (type of alcohol, precipitants of drinking, and situations in which risky drinking occurs).<sup>62</sup> Although ecological momentary assessment has not been used with AIAN populations, it holds promise to tackle some of the methodological concerns regarding alcohol use among AIAN women.

This review underscores a pressing need for well-designed epidemiological studies that collect comprehensive data from AIAN women. A comprehensive national epidemiological assessment conducted among both urban and rural AIAN women will yield higher quality, more representative data on the true prevalence, incidence, and risk and protective factors of alcohol consumption among pregnant and non-pregnant AIAN women.<sup>65</sup> Appropriate methods and measures to estimate alcohol use will be critical to generating accurate epidemiological and surveillance data on consuming alcohol during pregnancy. Capturing predictors of drinking, determining context during non-drinking days and identifying both risk and protective factors for risky drinking among AIAN women can illuminate contextual variables and clarify risky drinking patterns.<sup>62,66</sup> Finally, linking epidemiological data with community-led and community-engaged prevention and intervention efforts is essential to reduce adverse outcomes, especially consequences of binge drinking. As we show, available data on alcohol use among AIAN women come largely from retrospective surveys and small samples from disparate geographic regions and therefore lack information that is vital to intervention and prevention efforts.

In conclusion, this review highlights an urgent need for research on alcohol use during pregnancy and preconceptual AIAN women. Improved research criteria and study designs lead to better quality data, which can generate more rigorous data on the prevalence and consequences of alcohol use during pregnancy. Future efforts should assess patterns of drinking and non-drinking days, identify facilitators of drinking and abstinence behaviors, be larger and more representative (i.e. in urban and rural settings), and include pregnant and preconceptual AIAN women along with relevant comparisons groups. These data can inform a wide array of prevention and intervention efforts for pregnant AIAN women. Finally, interventions to prevent or reduce alcohol use during pregnancy should directly engage AIAN stakeholders and seek input on interest, need, benefit, and burden to the community. Community engagement and community-based participatory research with AIAN communities can significantly

improve study development, implementation, and community and health outcomes.<sup>67–69</sup> Applying this approach, we can overcome many of the stereotypes in alcohol research with AIAN communities; furthermore, we can improve public health prevention and intervention efforts by collaborating with Tribal communities to best meet their interests and benchmarks of success.<sup>68</sup>

## Declarations

### *Ethics approval and consent to participate*

Not applicable.

### *Consent for publication*

Not applicable.

### *Author contribution(s)*

**Jessica D Hanson:** Conceptualization; Project administration; Resources; Visualization; Writing – original draft; Writing – review & editing.

**Michelle Sarche:** Funding acquisition; Resources; Supervision; Visualization; Writing – review & editing.

**Dedra Buchwald:** Conceptualization; Funding acquisition; Project administration; Resources; Supervision; Visualization; Writing – review & editing.

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