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Preterm Birth among Pacific Islanders in the United States and the US-Affiliated Pacific Islands: a Systematic Review and Meta-analysis

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Abstract

Objective—To better understand the epidemiology of preterm birth among Pacific Islanders in the United States and the US-Affiliated Pacific Islands.

Methods—A systematic search of MEDLINE, Embase, CINAHL, PsycINFO, two non-indexed regional journals, and gray literature was conducted. The search was finalized in September 2021.

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Contributorship Statement: BW and NLH conceived the study, with the help from KA, KN, RS, and MM. KA, KN, RS, MM, and NLH developed the search strategy. KA, RS, MM, and NLH completed the study screening. BW and NLH extracted data from included studies. BW, KA, and NLH wrote the initial draft of the manuscript. All authors provided read, provided feedback on, and approved the final manuscript.

Observational studies published since January 2010 that documented preterm birth outcomes among Pacific Islanders in the United States and the US-Affiliated Pacific Islands were eligible for inclusion. Outcomes of interest included preterm birth prevalence, risk compared to White women, and risk factors for preterm birth among Pacific Islanders.

Results—Fourteen of the 3183 screened articles were included in meta-analyses. Random-effects models were used for pooled estimates with 95% confidence intervals. The pooled prevalence of preterm birth among Pacific Islanders was 11.2%, 95% CI: 9.3%−13.6%. Marshallese women had the highest pooled prevalence (20.7%, 95% CI: 18.6%−23.0%) compared to other Pacific Islander subgroups. Compared to White women, Pacific Islander women had higher odds of experiencing preterm birth (OR=1.40, 95% CI: 1.28–1.53). Four risk factors for preterm birth could be explored with the data available: hypertension, diabetes, smoking, and pre-pregnancy body mass index; hypertension and diabetes significantly increased the odds of preterm birth.

Conclusions—Existing literature suggests that US Pacific Islanders were more likely to experience preterm birth than White women, although the pooled prevalence varied by Pacific Islander subgroup. Data support the need for disaggregation of Pacific Islanders in future research and argue for examination of subgroup-specific outcomes to address perinatal health disparities.

Keywords

preterm birth; Pacific Islander; Marshallese; health disparities; meta-analysis

1 | INTRODUCTION

The global prevalence of preterm birth (PTB, live birth <37 weeks[1]) was 10.6% in 2014[1]; in the same year, the prevalence in the United States (US) was 9.6%, placing the US among the ten countries with the highest number of PTBs[2]. Since PTB contributes significantly to perinatal mortality and morbidity[3], understanding risk factors for PTB and reducing its prevalence are national public health priorities.

Racial disparities in the prevalence of PTB are evident in the US[4,5]. Several factors likely place Pacific Islander women at a higher risk of PTB compared to other populations: a greater burden of obesity-related cardiometabolic diseases prior to conception[6,7], lack of access to medical care and social services (depending on citizenship)[8–11], and experiences of discrimination[12] etc. These risk factors have been shown to be significantly associated with adverse perinatal outcomes in other populations[7,13–20], but, despite being among the fastest growing minority groups in the US[21], Pacific Islanders are underrepresented in obstetric research[22] and their outcomes are frequently aggregated with those of Asian American women[23].

In a recent scoping review[(24)] we qualitatively summarized existing literature on various adverse pregnancy outcomes, including PTB, and described a greater risk of several of those outcomes among Pacific Islanders compared to other groups. To date, there has been no attempt to quantify the pooled prevalence of PTB or to use meta-analyses to describe pooled risk compared to other populations. Our objectives were, therefore, to estimate: (1) the pooled prevalence of PTB among Pacific Islanders in the US and US

Affiliated Pacific Islands (USAPI) with meta-analyses stratified by ethnicity subgroup; (2) the pooled odds ratio estimate for PTB among Pacific Islanders compared to non-Hispanic White women; and (3) the impact of the most commonly reported risk factors for PTB (hypertension, diabetes, smoking, and weight status based on body mass index [BMI categories: underweight, overweight, or obesity]) on the odds of PTB among Pacific Islander women.

2 | METHODS

2.1 | Search strategy

This systematic review (PROSPERO ID CRD42021281673) was conducted based on papers identified in our previous scoping review[24]. The prior review's search strategy[24] and the protocol[25] for this meta-analysis were deposited on the Open Science Framework and are described briefly here. We followed the Meta-analysis of Observational Studies in Epidemiology (MOOSE) reporting guidelines[24] to present our outcomes. No research ethics board approval was required.

The original scoping review search strategy[24] was developed with two concepts: (1) Pacific Islander and (2) pregnancy and perinatal outcomes. The controlled vocabulary terms and keyword search terms used on MEDLINE (Ovid) are listed in Table S1. Articles without US/USAPI geographic subject indexing were not retrieved; articles that had a US/USAPI subject heading but did not have geographic subject headings were selected for screening.

A search of four databases was completed in August 2020: MEDLINE (Ovid), Embase (Ovid), CINAHL (EBSCO), and PsycINFO (Ovid). Additionally, two regional journals that are not well indexed in major bibliographic databases were hand-searched (the Pacific Journal of Reproductive Health and Pacific Health Dialog). Data reported by national, state and territorial government agencies, for example the Centers for Disease Control, State Departments of Health, and the Pacific Island Health Officers Association were also searched. Citation chaining was conducted on all included articles.

Our study population was Pacific Islander women living in the US and USAPI, including American Samoa, Guam, the Commonwealth of the Northern Mariana Islands (CNMI), the Federated States of Micronesia (FSM) and the Republic of the Marshall Islands (RMI). Studies of New Zealand women with Māori ethnicity (the indigenous Polynesian people of New Zealand) living in the US were included, but data on non-Māori New Zealander women in the US were not included. Articles were excluded if they reported outcomes from Pacific Islander women outside of the US or USAPI, or aggregated Pacific Islander women with other races/ethnicities.

2.2 | Study selection

To summarize the most recent and relevant literature, articles published between January 2010 and September 2021 were included. Peer-reviewed publications, government reports and PhD dissertations written in the English language met inclusion criteria. Conference abstracts and master's theses were excluded since they may not have represented final study outcomes. Review articles were also excluded, but their references reviewed for additional

primary data sources. Each publication was reviewed by two independent authors. Four team members completed title-abstract and full text screening on Covidence and met to solve vote conflicts.

This review focuses specifically on PTB. Therefore, we selected articles from our prior scoping review that reported PTB outcomes (n=17) for further analysis. Data were collected from the included studies about: (1) the prevalence of PTB; (2) risk of PTB among Pacific Islanders compared to non-Hispanic White women (the most commonly reported reference group in the papers available); and (3) risk factors for PTB. The four most commonly examined risk factors - hypertension, diabetes, smoking during pregnancy, and weight status– are summarized here. To ensure the most up to date data were included in this meta-analysis, the search was repeated in September 2021 and three additional articles identified for inclusion (see Results).

Data extraction, completed by the first author, included participant characteristics and sample size, PTB outcomes, data collection period and data source, study setting and design, and gestational age estimation method. If the study design (i.e. cross-sectional, retrospective, etc.) was not reported by study authors, the first author made a designation according to study methods.

For the PTB prevalence analysis, if a study only reported the prevalence without the specific event number, the number of PTBs was calculated with the formula: $N(\text{PTBs}) = P * N(\text{total Pacific Islanders})$ and rounded to the next whole number (N for sample size; P for the prevalence of PTB). For the comparison to non-Hispanic White women, modelling methods and adjusted confounders were recorded. If an article did not report the comparison between Pacific Islanders and White women, odds ratios (OR) were calculated as the odds of having PTB among Pacific Islanders over the odds among White women, based on the proportion of PTB among the two races respectively. For the articles reporting risk factors, modelling methods and adjusted confounders were recorded. Due to the small number of studies available, these risk factors were summarized in one forest plot without pooled estimates.

2.3 | Quality assessment

We used Joanna Briggs Institute (JBI) critical appraisal tools[25] for risk of bias assessment; two authors (BW and KJA) completed the appraisal and met to reach consensus. Articles selected for PTB prevalence meta-analysis were assessed with the JBI checklist for prevalence studies[26]. Articles used for the comparison between Pacific Islander and White women and the summary for common risk factors were assessed with the JBI checklist for analytical cross-sectional studies[27]. The total score assigned to each study equals the proportion of “Yes” responses to checklist questions (range: 0%−100%). Since a funnel plot may not accurately assess publication bias for a prevalence meta-analysis[28], to be consistent for all the included studies, we used Egger’s test[29] to assess publication bias (a test to determine whether the study estimate is related to the size of the study).

2.4 | Data Synthesis

A total of three meta-analyses were conducted. Along with the overall prevalence meta-analysis, we completed an additional meta-analysis that described prevalence by Pacific

Islander sub-group (i.e. Native Hawaiian, Guamanian, Samoan). Subgroups were included if at least two studies reported subgroup-specific outcomes. If an article did not specify which Pacific Islander subgroups were included, or the subgroups were aggregated, it was not included in the subgroup meta-analyses. Meta-analyses were not conducted for the four risk factors due to the limited number of articles reporting these outcomes; they were summarized in one forest plot without pooled estimates.

Since most of the included studies reported their outcomes in the form of ORs, these were used as the measure of association across studies. Hazard ratios (HR) and incidence density ratios (IDR) were considered as relative risks (RR). Where necessary, RRs were transformed into ORs with the formula[30] $OR = \left[RR^{*}(1 - P_0)\right]/[1 - P_0^{*}RR]$, in which P_0 is the prevalence of PTB among non-Hispanic White women. The standard error (SE) of the converted OR was calculated with the formula[31] $\mathrm{SElog}\,(OR) = \mathrm{SElog}\,(RR)^{\star}[\log(OR)/\log(RR)]$. Since these transformations can overestimate the variance of the ORs derived from the RRs[32], we also performed sensitivity analyses that excluded one article with this transformation.

Pooled estimates with 95% confidence intervals are presented with Forest plots sorted by the starting year of data collection. Heterogeneity was assessed with the I^2 statistic with low, moderate, and high I^2 values of 25%, 50%, and 75%, respectively[33]. If I^2 ≤25% (indicating no evidence of heterogeneity), fixed effects models (Mantel-Haenszel method)[34] were used to pool the results. Otherwise, random effects models (DerSimonian and Laird method)[35] were used instead. Sources of heterogeneity were explored with meta-regression analysis. All analyses were performed using RStudio (RStudio, Inc., Boston, MA, USA). R package **meta**[36] was used to generate Forest plots and to conduct meta-regression, and package **dmetar**[37] was used to perform Egger's test for publication bias (*P*-value <0.05 indicates publication bias).

3 | RESULTS

Our scoping review[(24)] identified a total of 3183 articles from four databases. After de-duplication, title-abstract and full text screening, adding seven papers identified through gray literature searching and two from hand-searching journals, 48 articles were included in the scoping review. For the purpose of this analysis focused on PTB, 18 of those articles were selected as potentially relevant for analysis. We later excluded one article[38] where RR could not be transformed into an OR since the prevalence of PTB for each race/ethnicity was not provided. In our second search, we identified a total of 617 articles published between January 2020 and September 2021 through the same search strategy. Using the same screening approach, we selected 3 new articles for analysis (Figure 1). After removing potentially overlapping data from different sources (for example, if studies reported data collection using the same data source, with overlapping timelines), a total of 14 studies[39–52] were included in the meta-analyses presented here. Two[51,52] of the 14 studies were identified through the gray literature search. In both searches, the most common reason for exclusion at the full-text screening stage was the aggregation of Pacific Islanders with Asian American women.

3.1 | Characteristics of the studies

Details of the included studies are presented in Table 1 ordered by the starting year of data collection, which occurred between 1989 to 2018. Of the 14 included studies, 10 (71.4%) studies[41,42,44,45,47–52] reported PTB prevalence among Pacific Islanders, 8 (57.1%) studies[40,42,44,45,47,48,51,52] were used to estimate risk of PTB compared to White women, and only 2 (14.3%) studies[46,50] reported risk factors (hypertension, diabetes, smoking during pregnancy, and weight status [underweight, overweight, or obesity]) for PTB in Pacific Islander-specific analyses. Smoking before pregnancy was not reported[46,50].

Since diagnosing PTB relies on accurate gestational age assessment, we summarized the gestational age (GA) estimation method in each included study (Table 1). Most of the included studies[39,40,44,47–49,51] used clinical or obstetric estimates of GA[53] which were calculated from a combination of ultrasound and last menstrual period (LMP). One study[42] assessed GA with ultrasound only for the most of enrolled women, and three studies[39,41,46] used LMP. One study[54] used participant reported PTB (the symptom of PTB, yes/no), and the rest of studies[43,45,50,52] did not report how GA was assessed. Except for one study[43], where the definition of PTB was not reported, all included studies used the standard definition of live birth at <37 weeks gestation.

Outcomes of the risk of bias assessment are presented in Table S2-Table S4. Scores ranged from 37.5% to 100.0%, with higher scores indicating a lower risk of bias. Modeling methods and adjusted confounders in each included studies in the meta-analyses (Figure 4-Figure 5) are summarized in Table S5-Table S6. Among the 8 articles[40,42,44,45,47,48,51,52] used in the analysis that compared PTB risk for Pacific Islander and White women, three[40,45,48] (43.8%) included race/ethnicity as an adjusted confounder, while the rest of the comparison estimates were calculated from PTB prevalence in Pacific Islanders and White women.

3.2 | Prevalence of PTB

Ten studies[41,42,44,45,47–52] reported prevalence of PTB among Pacific Islanders (Figure 2). The overall random-effects pooled prevalence was 11.2% (95% CI: 9.3%−13.6%). The outcome of PTB prevalence meta-analyses by ethnicity subgroup is presented in Figure 3. Among Guamanian, Hawaiian[41,47,50,51] and Samoan[39,41,50,51] women, the prevalence of PTB in the past 25 years was similar to the pooled estimate, yet the prevalence among Marshallese[39,42] was twofold higher (20.7%, 95% CI: 18.6%−23.0%) than the other Pacific Islanders subgroups (Figure 3).

3.3 | Risk of PTB compared to White women

Eight studies[39,40,42–48,51,52,54–59] were used to compare risk of PTB among Pacific Islanders and White women (Figure 4). Compared to White women, Pacific Islanders had 1.40 times the odds of having a PTB (random-effects pooled OR=1.40, 95% CI: 1.28–1.53). To ensure the accuracy of this finding, we also conducted a sensitivity analysis in which we excluded the article[42] that reported with RR rather than OR, and found the association was still significant with the same direction (random-effects pooled OR=1.37, 95% CI: 1.26–1.48).

3.4 | Summary of risk factors for PTB among Pacific Islanders in the US and USAPI

We only identified two articles[46,50] that reported risk factors for PTB in this population (Figure 5). Pacific women with any type of hypertension or diabetes tended to have higher odds of PTB compared to Pacific women without hypertension or diabetes. The observed associations between smoking and PTB were not consistent. Furthermore, we did not observe differences in the odds of PTB among Pacific Islander based on weight status.

3.5 | Sources of heterogeneity

We checked four characteristics of each article to identify potential sources of heterogeneity: starting year of data collection, study duration, publication year, and study quality based on the JBI checklist score. None of these characteristics explained the observed heterogeneity in either the prevalence of PTB estimate (starting year of data collection, P=0.64; study duration length, P=0.53; publication year, P=0.78; study quality, P=0.80) or risk of PTB compared to White women (starting year of data collection, P=0.81; study duration length, P=0.80; publication year, P=0.51; study quality, P=0.62).

3.6 | Publication bias

We did not identify any publication bias in our meta-analyses: for the PTB prevalence estimate, P=0.44; for the risk of PTB compared with White women, P=0.95

4 | DISCUSSION

This is the first meta-analyses of data related to PTB among women of Pacific Islander ethnicity in the US and USAPI and these findings move significantly beyond the current status quo by providing pooled estimate of PTB prevalence among Pacific Islanders, as well as ethnicity-specific subgroup estimates, and by quantifying PTB-related health inequity among this group compared to White women.

Racial and ethnic disparities in PTB have been well documented in the US. Non-Hispanic Black women (13.6%) are almost 1.5 times more likely than non-Hispanic White women (9.5%) to experience PTB[60]. Our findings place most Pacific Islander women at relatively lower risk compared to non-Hispanic Black women, but at higher risk than White women and markedly higher risk than has been reported for Asian/Pacific Islanders combined (8.9% based on data from 2017–2019[61]), highlighting the importance of disaggregating these groups. The increased risk of PTB among Pacific Islander women compared to non-Hispanic White women may be due to poorer antenatal care uptake, pre-pregnancy or maternal obesity, limited healthcare access, or experience of discrimination[12,49,50,62–65], although further research is needed.

The particularly high prevalence of PTB reported among Marshallese women deserves further attention, even though they comprised a relatively small proportion of all women included in our meta-analyses. Much of the existing data on the perinatal health of Marshallese women comes from residents of Arkansas (as did two-thirds of the Marshallese sample included in our meta-analyses). Prior studies among Marshallese women resident in Arkansas have described delayed and underutilized prenatal care compared to non-Hispanic

White women[42]. Cited barriers, which may be specific to the Arkansas setting, include delaying care until health crises[62–64], language barriers[38], lower educational attainment[39], and distrust of Western medicine or health professionals[8–11,66]. Importantly, at the time of data collection by two of the studies (1997–2013[42], 2003–2005[39]), Marshallese migrants were not eligible for most Federal benefits, including Medicaid, despite having legal residence and rights to work in the US[63]. Recent restoration of Medicaid eligibility for Compact of Free Association (COFA) migrants (December 2020)[67,68] may positively impact health care utilization among Marshallese women in coming years, although the perinatal health of this at-risk group should be closely monitored. Meanwhile, further programs like the ongoing community-based participatory research in Arkansas should be promoted to better understand the cultural and environmental context for Marshallese women in the state and to address the noted disparities in perinatal outcomes[69].

Few studies conducted Pacific Islander-specific analyses of risk factors for PTB. While smoking is a well-known risk factor for PTB among other ethnic groups[70,71], we did not observe this consistently among the studies included in our review. Previous studies suggest that the association between smoking and PTB may be modified by factors such as trimester-specific smoking patterns[70] and passive or initiative smoking[72,73], which we were unable to explore given the paucity of studies. Hypertension and diabetes are also important risk factors for PTB[74–77], and may be of particular relevance to Pacific Islander women given their increased risk of pre-pregnancy obesity[78,79] and excessive gestational weight gain[80]. It is unclear whether the significance of the observed associations resulted from the chronic conditions alone or were modified by higher body mass index (BMI), which is known to independently increase the odds of PTB[7]. Although the combination of a high prevalence of overweight or obesity among the general Pacific Islander population and prior studies in other race/ethnic groups suggesting increased risk of PTB among women with this risk factor[7,81] provided some of the motivation for this work, we only identified two studies[46,50] that examined the association between BMI and PTB (neither of which showed an association). Both included speculated as to why they did not observe this expected association, but more research is needed to examine whether PTB risk is modified by maternal BMI in this population as it appears to be in others.

There are several considerations that should be made in interpreting the findings presented here. First, while we made efforts to reduce the potential overlap in study participants represented by the studies included, we may not have been able to account for all overlap. We suspect that there may be a very small degree of overlap between a Hawaii State Department of Health report[51] and Quan et al[41] based on both studies including data from 2015. We conducted a sensitivity analysis excluding the Hawaii report[51] (due to its smaller sample size compared to Quan et al[41]) and did not find an obvious change (11.5%, 95% CI 9.3%−14.1%). Second, it should be noted that transforming RRs into ORs may overestimate association (i.e. Altman et al, preexisting hypertension with pre-eclampsia vs. non-hypertension, RR=8.0, 95% CI 5.9–10.7, transferred OR=15.78, 95% CI 10.63–23.42). Third, we observed high heterogeneity in our analyses. Recent methodological studies indicate that this is common in proportional meta-analyses due to the nature of the data[82,83] and should not necessarily be of concern. We attempted to identify the source by including publication characteristics in meta-regression analyses and did not find an

immediate explanation so exploring the heterogeneity in these studies should be the focus of future research efforts. Fourth, methods for estimating GA varied. Studies reported with obstetric estimates of GA may underestimate the PTB prevalence[53,84]. Concerns have been raised in similar studies about the self-reported nature of ethnicity. While ethnicity was likely self-reported by most participants included here, we do not consider this a weakness since PTB has a number of social as well as biological risk factors that may be best captured through group identity. Similarly, White women were selected as the reference group for the risk comparison of PTB since this comparison was reported the most in relevant studies, although best practice may have been to select the comparison group with the lowest PTB prevalence. Finally, by design, we were limited in this analysis to examining only those risk factors reported in the existing literature. Beyond these individual characteristics, there are many social determinants of health that are as yet unexplored and which may be of equal or greater importance in explaining risk of PTB among this group.

Study strengths include the use of MOOSE reporting guidelines[24], strict article screening criteria, and a comprehensive search of multiple databases. We also recorded the adjustment methods and confounding factors in each study, and conducted sensitivity analyses to verify our meta-analysis outcomes.

Based on our meta-analysis, PTB prevalence among Pacific Islanders in the US and USAPI was 11.2%, and they were more likely than non-Hispanic White women to experience PTB. Marshallese women had a markedly higher pooled prevalence 20.7% than the average for Pacific Islanders and should be a target for prevention efforts. Our findings support ongoing calls to disaggregate the health outcomes of Pacific Islander women from those of Asian American ethnicity and argue for further disaggregation of data to represent the many Pacific Islander subgroups that make up this larger group in order to reveal the true burden of adverse pregnancy outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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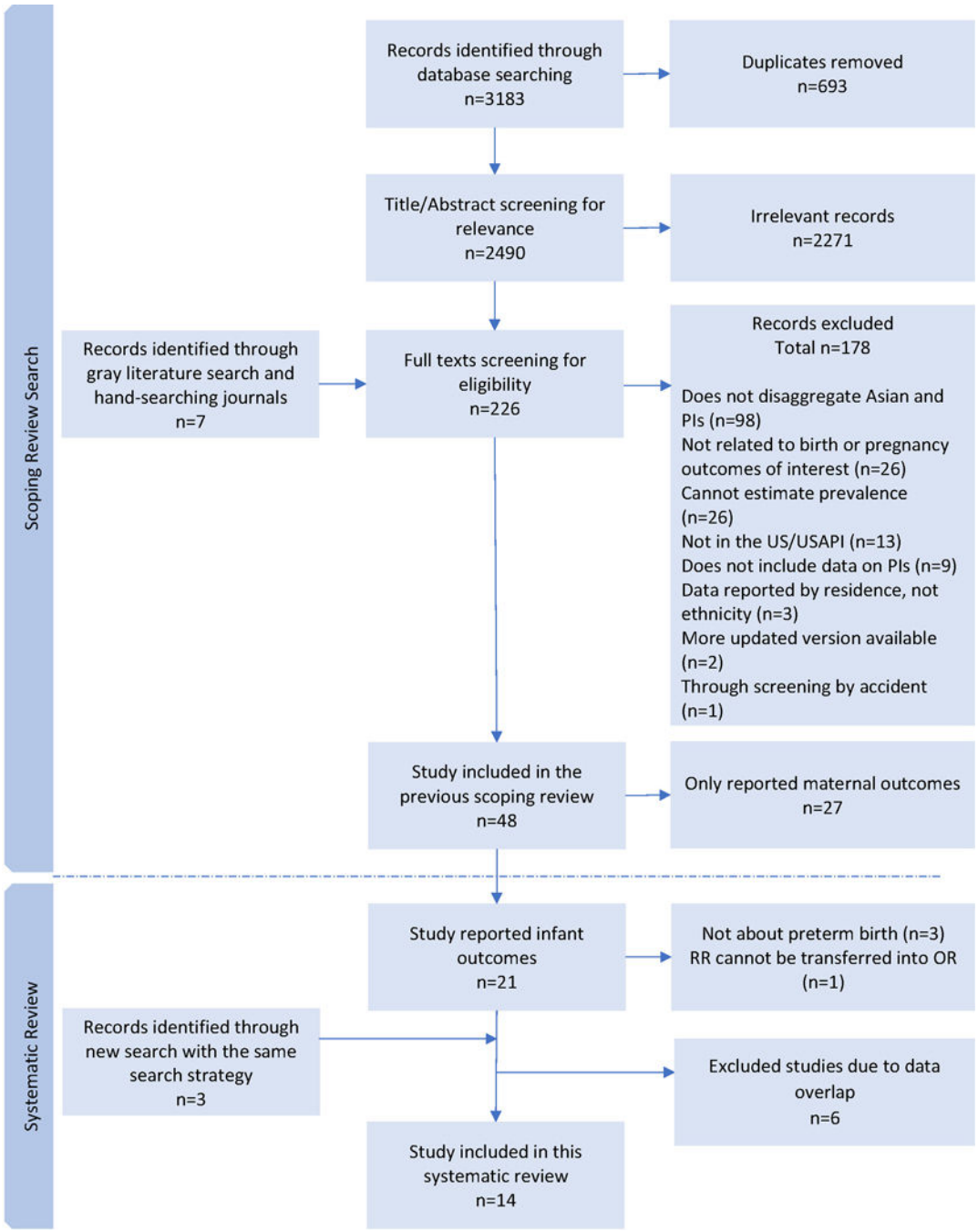

Figure 1.
Flow diagram of study selection

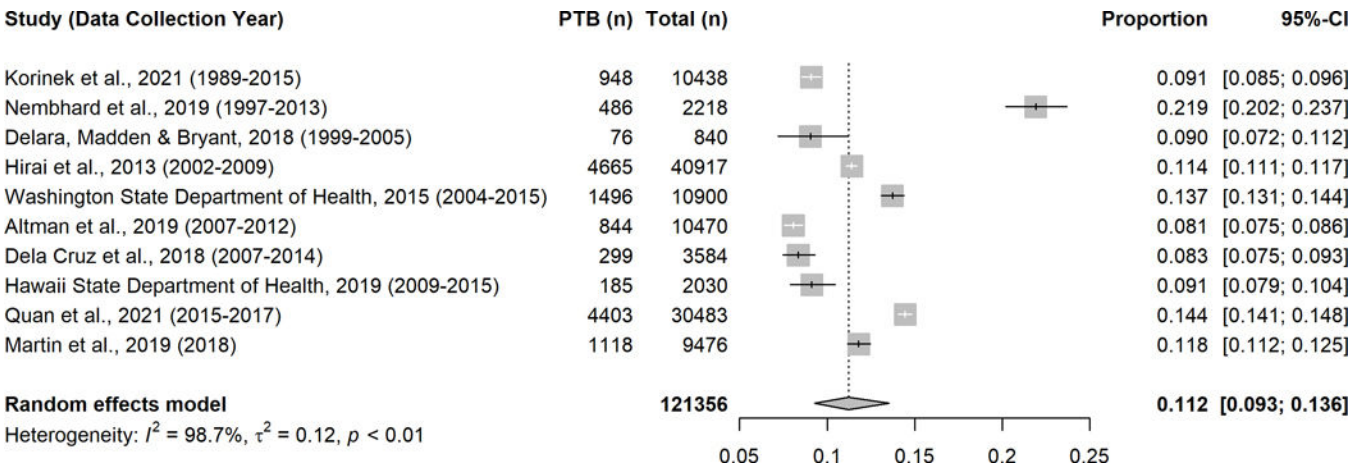

Figure 2.
Forest plot of preterm birth prevalence among Pacific Islanders

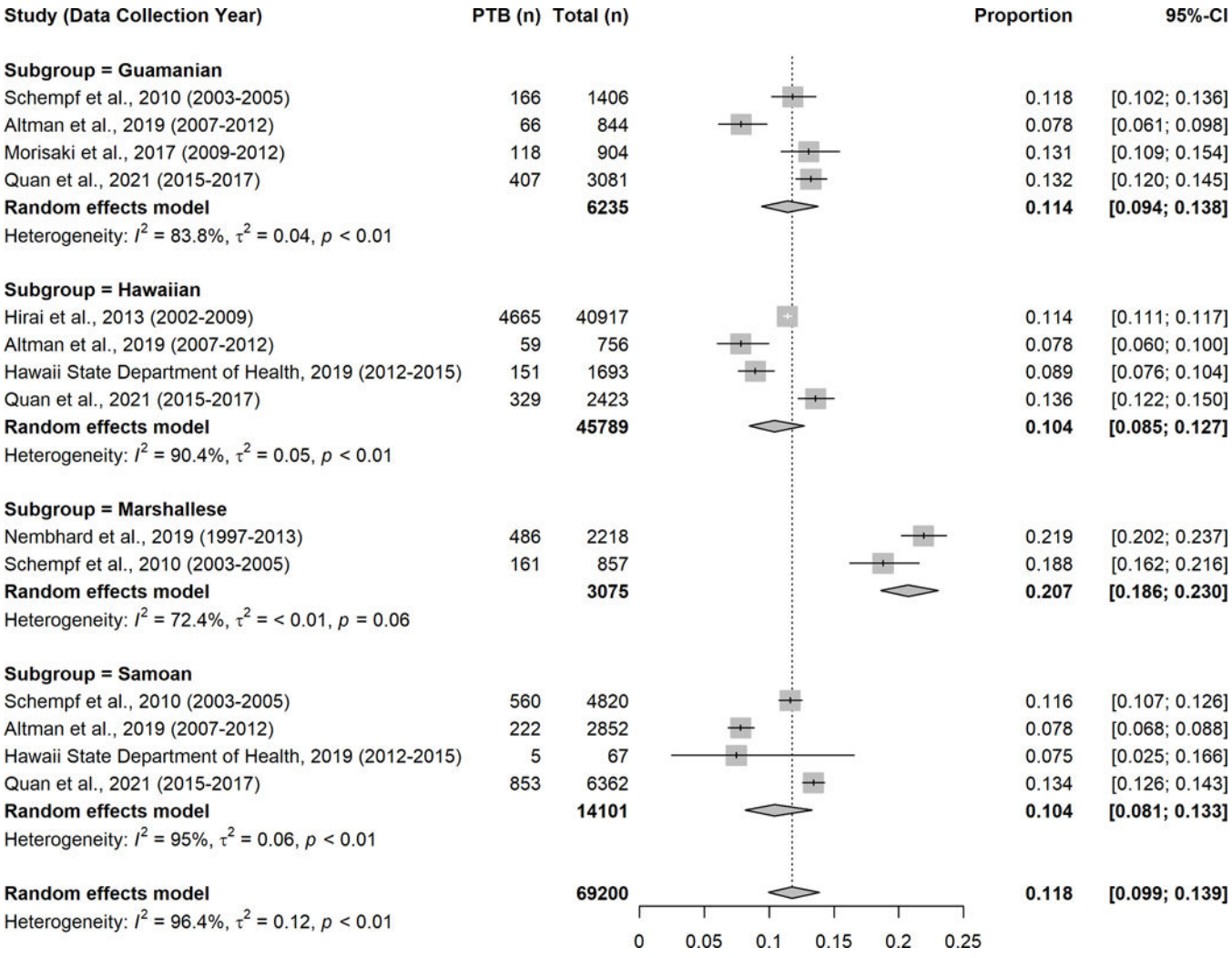

Figure 3.

Forest plot of preterm birth prevalence among Pacific Islanders by four ethnicity subgroups*

* Please note, the overall estimate presented here is not expected to match that in Figure 2 since different studies reported with subgroup ethnicity outcomes were included in these analyses.

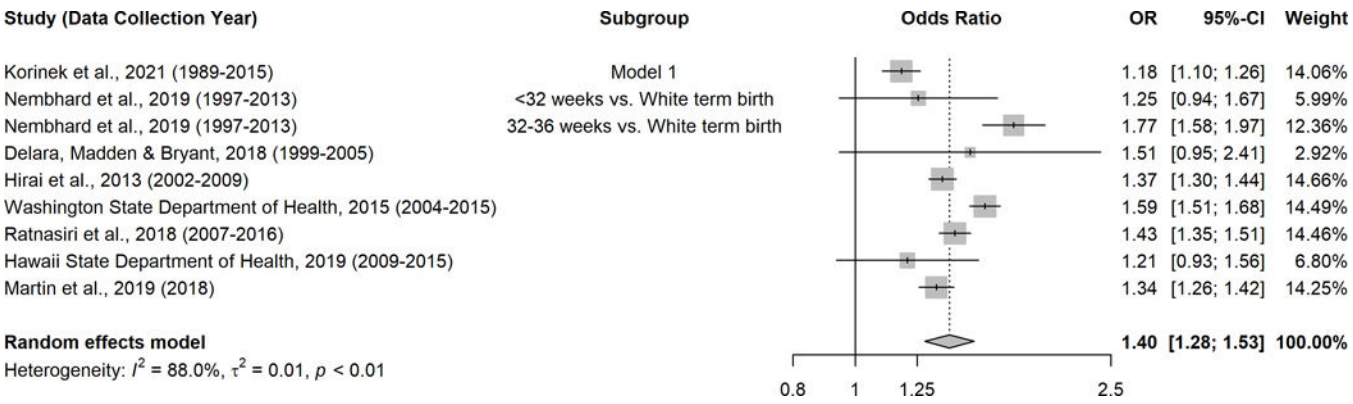

Figure 4.

Forest plot of risk of preterm birth among Pacific Islanders compared to White women

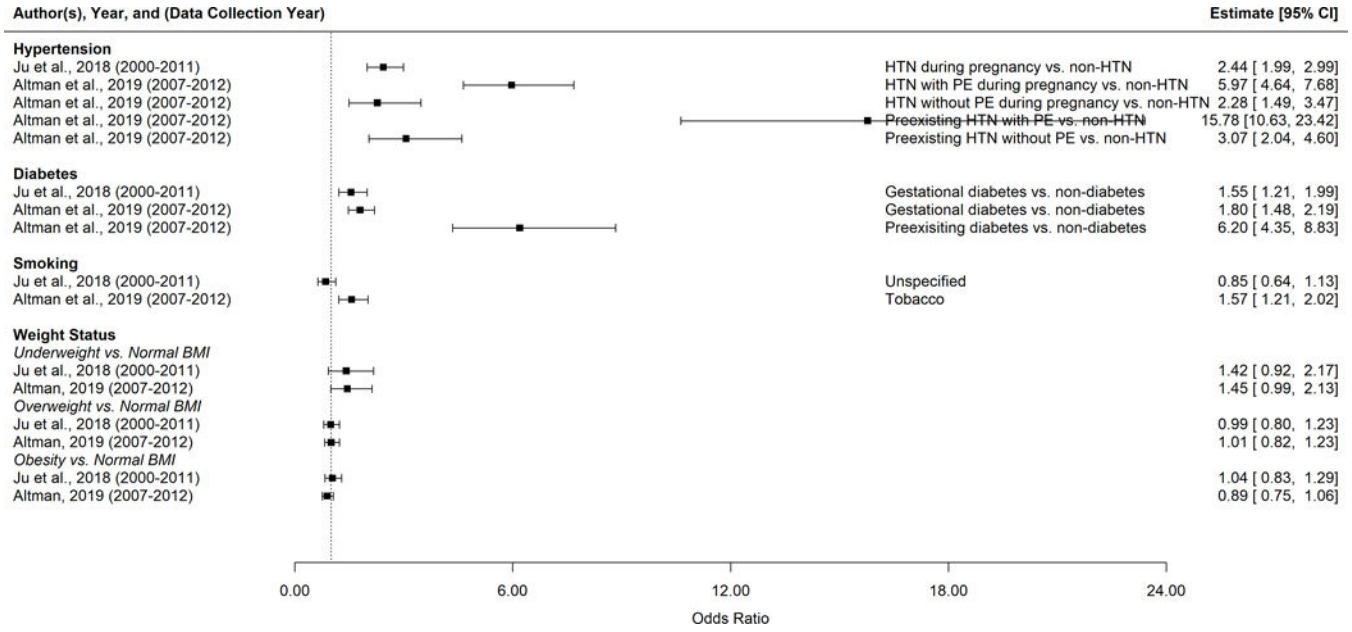

Figure 5.

Summary of reported risk factors for preterm birth among Pacific Islanders in the US and the USAPI*

* HTN, hypertension; PE, pre-eclampsia; BMI, body mass index, (underweight: <18.5 kg/m^2, normal BMI: 18.5–24.9 kg/m^2, overweight: 25–29.9 kg/m^2, obesity: >= 30 kg/m^2).

Table 1

Details of included studies and risk of bias assessment method

Study	Data collection	Study design	State/Setting	Pacific Islanders	GA measurement method	PTB definition
Korinek et al., 202145 [a, c]	1989–2015	Cross-sectional study[e]	Utah (Utah Population Database)	Native Hawaiian or Other Pacific Islanders (n=10,438).	Not reported	GA <37 weeks
Nembhard et al., 201942 [a, b, c]	1997–2013	Cross-sectional study	Arkansas (Birth records)	Marshallese (n=2,488, missing value n=270) [†].	Ultrasound (74%)	GA <37 weeks
Delara et al., 201848 [a, c]	1999–2005	Retrospective cohort study	California (Birth records)	Pacific Islander (n=840).	Best clinical estimate on the birth certificate	GA <37 weeks
Ju et al., 201846 [d]	2000–2011	Retrospective cohort study	Hawaii (Hawaii's Pregnancy Risk Assessment Monitoring System)	Native Hawaiian or Pacific Islander (n=7,657).	Last menstrual period, or algorithm calculation based on other similar records.	GA <37 weeks
Hirai et al., 201347 [a, b, c]	2002–2009	Cross-sectional study[e]	Hawaii (Hawai'i State Linked Birth/Infant Death Cohort Files)	Native Hawaiian (n=40,917) [†].	Clinical estimate (99.8%) or last menstrual period (0.2%)	GA <37 weeks
Schempf et al., 201039 [b]	2003–2005	Cross-sectional study[e]	California and Hawaii (Birth certificate data)	Native Hawaiian (n=16,805) [†]; Guamanian (n=1,406) [†]; Marshallese (n=938) [f]; Samoan (n=4,820) [†]; Tongan (n=1,594)	Last menstrual period (CA); last menstrual period and clinical estimate (HA)	GA <37 weeks
Washington State Department of Health, 201552,58 [a, c]	2004–2015	Descriptive study[e]	Washington (Washington State Birth Certificate Data)	Pacific Islander (n=10,900).	Not reported	GA <37 weeks
Altman et al., 201950 [a b, d]	2007–2012	Retrospective cohort study	California (California Office of Statewide Health Planning and Development birth cohort database)	Hawaiian (n=756) [†]; Guamanian (n=844) [†]; Samoan (n=2852) [†]; Other Pacific Islander (n=5422); More than one (n=596).	Not reported	GA <37 weeks
Dela Cruz et al., 201849 [a]	2007–2014	Retrospective cohort study cohort study	Commonwealth of the Northern Northern Mariana Islands (Hospital records)	Chamorro/Carolinian (n=2,799); Other Pacific Islander (unspecified, n=785).	Obstetric estimate	GA <37 weeks
Ratnasiri et al., 201840 [c]	2007–2016	Retrospective cohort study	California (Birth Statistical Master Files)	Guamanian, Hawaiian, Samoan, and other Pacific Islander (n not reported).	Obstetric estimate	GA <37 weeks
Morisaki et al., 201743 [b]	2009–2012	Descriptive study[e]	United States (The National Natality File)	Hawaiian (n=152) [†]; Guamanian (n=904) [†]; Samoan (n=2,481) [†].	Not reported	Not reported
Hawaii State Department of Health, 201951 [a, b, c]	2012–2015	Descriptive study[e]	Hawaii (The Pregnancy Risk Assessment Monitoring System)	Native/Part Hawaiian (n=1,693) [†]; Samoan (n=67) [†]; Other Pacific Islander (Guamanian or Other, n=270).	Clinical estimate	GA <37 weeks
Quan et al., 202141 [a, b]	2015–2017	Cross-sectional study[e]	United States (The National Natality File)	Hawaiian (n=2,423) [†]; Guamanian (n=3,081) [†]; Samoan (n=6,362) [†].	Last menstrual period	GA <37 weeks

Study	Data collection	Study design	State/Setting	Pacific Islanders	GA measurement method	PTB definition
Martin et al., 201844 [a c]	2018	Descriptive study[e]	United States (The National Natality File)	Native Hawaiian or Other Pacific Islander (n=9,476)	Obstetric estimate	GA <37 weeks

GA, gestational age; PTB, preterm birth; CA, California; HA, Hawaii.

[a]Labeled studies were included in general prevalence meta-analysis.

[b]Labeled studies were included in subgroup ethnicity prevalence meta-analysis.

[c]Labeled studies were included in risk comparison meta-analysis.

[d]Labeled studies were included in the summary of risk factors for preterm birth.

[e]Labeled study design was not reported and was decided by the first author's judgement.