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Intimate Partner Violence Screening in the Prenatal Period: Variation by State, Insurance, and Patient Characteristics

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Abstract

Objective To measure the proportion of women screened for IPV during prenatal care; to assess the predictors of prenatal IPV screening. *Methods* We use the CDC's 2012 Pregnancy Risk Assessment Monitoring System, representative of births in 24 states and New York City (N = 28,581). We calculated descriptive and logistic regressions, weighted to deal with state-clustered observations. *Results* 49.2% of women in our sample reported being screened for IPV while pregnant. There were higher screening rates among women of color, and those who had not completed high school, never been married, received WIC benefits, initiated prenatal care in the first trimester, and were publicly insured. State screening rates varied (29.9–62.9%). Among states, mandated perinatal depression screening or training was positively associated with IPV screening. 3.6% of women in our sample reported prenatal IPV but were not screened during pregnancy. *Conclusions for Practice* Current efforts have not led to universal screening. We need to better understand when and why providers do not screen pregnant patients for IPV.

Keywords Intimate partner violence · Prenatal care · State policy · Screening

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Significance

Previous research finds demographic variation in screening for intimate partner violence during prenatal care. This research has not examined how screening varies geographically, which prevents us from understanding the role differences between states, such as state policy, can play in influencing screening practices.

The present study confirms demographic variation in screening but also uncovers substantial variation between states in screening rates. Relevant state predictors include the prevalence of Federally Qualified Health Centers, OB/GYNs per capita, state abortion funding, and the governor's political affiliation. This suggests a need for attention to both provider and state factors in analyzing screening rates.

Prenatal care providers are on the frontlines in ensuring the health of women and unborn children during pregnancy. The United States Preventive Services Task Force (USPSTF), American Congress of Obstetricians and Gynecologists (ACOG), the American College of Nurse Midwives (ACNM), and the Association of Women's Health, Obstetric and Neonatal Nurses (AWHONN) recommend providers screen all women for exposure to intimate partner violence (IPV), with some explicitly recommending multiple

screenings—at first prenatal visit, during each trimester, and postpartum (ACNM 2013; ACOG 2012; AWHONN 2015; USPSTF 2013). Missed opportunities to provide support and resources to women experiencing IPV can have critical consequences for mothers and infants; prenatal IPV is associated, among other outcomes, with increased risk of preterm births and low birthweight (Campbell et al. 1999; Wiencrot et al. 2012), and, among mothers, substance abuse and depression, as well as maternal morbidity and mortality (Alhusen et al. 2015; Chang et al. 2005; El Kady et al. 2005). USPSTF finds that there are minimal risks to screening if done privately, and there is suggestive evidence for effective interventions to support women experiencing IPV (Moyer 2013).

Prior studies suggest that prenatal care providers have fallen short of universal screening. Providers describe time constraints and difficulties handling a patient's IPV disclosure as barriers to screening (Garimella et al. 2000; Gerbert et al. 1999; Waalen et al. 2000). Nonetheless, previous research using the CDC's Pregnancy Risk Assessment Monitoring System (PRAMS) survey of postpartum women provided some indications that screening rates may have risen substantially over time; some earlier studies estimated about one quarter to a third of pregnant women were screened, versus about half of patients a decade later (Durant et al. 2000; Krans et al. 2013; Petersen et al. 2001). Previous research found that socioeconomic disadvantage was associated with a higher likelihood of being screened; some studies found that those with self-reported IPV experience were more likely to be screened for IPV, but others have not (Cha and Masho 2014a; Durant et al. 2000; Krans et al. 2013).

In addition to variation across individuals in screening experiences, there are reasons to expect that screening rates may vary geographically. States vary in their laws—for example, whether health care providers are required to receive IPV training (Durborow et al. 2010); they also vary in their resources, such as their number of Federally Qualified Health Centers relative to their population size. Despite these variations, to our knowledge there is no research establishing state variation in screening rates.

Since the most recent PRAMS data analyzed is more than a decade old (Cha and Masho 2014a; Durant et al. 2000; Krans et al. 2013; Petersen et al. 2001), there is a need for an updated snapshot on who is being screened as protocols and practices may have changed. Using 2012 PRAMS survey data, this study analyzed womens' reports of provider screening for physical safety during prenatal appointments with attention to potential variation by state characteristics (e.g., number of Federally Qualified Health Centers), insurance type (e.g., public vs. private), and their individual characteristics (e.g., educational attainment); because PRAMS does not ask about all forms of IPV (e.g., emotional, sexual, or economic abuse), we focus on the only

available measures: physical IPV and reproductive control. The current study provides insights into the variations in prenatal IPV screening, a necessary baseline for (a) determining strategies to build toward universal screening and (b) evaluating in future research whether recent changes in health insurance policy (e.g., the ACA expanding Medicaid access) influence women's likelihood of receiving IPV screening in the prenatal period.

Methods

PRAMS is an annual population-based surveillance system sponsored by the Centers for Disease Control and Prevention (CDC) to collect self-reported data about maternal experiences before, during, and after pregnancy. Using state birth records, participating states select a representative sample of women with a recent live birth to survey each month, including an oversample of vulnerable populations (e.g., women with preterm births and those from under-represented minority groups) to ensure adequate data for analysis. We used the CDC-recommended sample weights to adjust for nonresponse and to produce state-representative estimates.

PRAMS is a multi-mode survey; selected women first receive a survey by mail, and those who do not return the survey are interviewed by telephone. All states use a common core questionnaire, which is supplemented with additional standard questions selected by each state. In this analysis, we relied on common questions that are standard across all states. Our data included respondents from 24 states and New York City (N = 28,851), which represent the state data we received access to under our data sharing agreement. We received an IRB exemption for this project.

Variables

Outcome: IPV Screening

Our outcome of interest was a binary measure of women's self-reports of having been screened for IPV during the course of prenatal care. Respondents were asked, "During any of your prenatal care visits, did a doctor, nurse, or other health care worker talk with you about…physical abuse to women by their husbands or partners;" those who respond affirmatively were coded as having been screened.

IPV Exposure and Cases of Missed IPV

We also calculated a dichotomous measure of IPV exposure. It incorporates three items from the PRAMS core questionnaire, two of which ask about physical abuse before and during pregnancy ("During your pregnancy" or "In the 12 months prior to your pregnancy" did "your husband or

partner, push, hit, slap, kick, choke or physically hurt you in any other way?"). In order to identify other forms of IPV, we also include an item measuring reproductive control: Women who reported not using contraception prior to pregnancy because of partners' wishes are also included in our measure of IPV exposure. We then used the measures of IPV exposure and IPV screening (described above) to create a binary indicator for "missed IPV"—cases in which patients reported both *experiencing IPV* (either physical violence or reproductive control) but *not being screened*.

Covariates

We included a variety of individual demographic covariates, including categorical measures of age, race/ethnicity, education, and dummy indicators for poverty status and pregnancy intentionality. Pregnancy intentionality is a variable that indicates if, just prior to learning of her most recent pregnancy, a woman wanted to be pregnant at that time or sooner. We also included covariates related to prenatal care, including type of insurance (public, private, military, other, or none), and a dummy indicator for whether the respondent received prenatal care during the first trimester. Lastly, we included a control for whether a woman reported receiving screening on any other topic during prenatal care, such as depression, smoking, and safe medication use.

State-Level Covariates

Because state context, including policies and demographics, may impact the state screening rates, we estimated models with a variety of state-level covariates. Online Appendix A describes these items. These covariates fall in three categories: state prenatal or IPV policy, healthcare infrastructure, and state demographics. Policy measures include separate indicators for whether a state had mandated perinatal depression screening or training for providers and established IPV screening protocol or training. Healthcare measures included the proportion of patients per 10,000 female state residents who received care from a Federally Qualified Health Center (FQHC). Demographic measures included the proportion of the state population who lived in an urban area, and separate indicators for the proportion of residents with a bachelor's degree, who are white, below 200% of the poverty line, and who are married.

We conducted all analysis with Stata SE 14.2 using the survey commands to account for the complex survey design and CDC-recommended weighting. We first calculated bivariate relationships of screening rates and missed IPV cases by state and covariates of interest and tested for unadjusted differences in weighted means. We then conducted multivariate logistic regression models predicting (1) IPV screening rates and (2) missed IPV cases.

Results

Just under half of women (49.2%) reported being screened for IPV during prenatal care; this rate varied widely between states, with Utah reporting the lowest screening rate at 29.9% and New Mexico reporting the highest rate at 62.9%. Figure 1 maps IPV screening rates by quartile for the states in our sample.

Reported screening rates also varied across individual and insurance characteristics as seen in Table 1. Screening rates are higher for traditionally less advantaged groups. Women who identified as Hispanic (59.8%), black (62.8%), and American Indian/Alaska Native (63.9%) were significantly more likely to report being screened than non-Hispanic white (43.7%) or Asian women (41.4%) ($p < 0.001$). Women who were younger (58.8% −64.5%), had not completed high school (63.1%), had household incomes below the poverty threshold (59.0%), received WIC during pregnancy (59.9%), and were not married (60.4%) all reported higher than average screening rates. Women with private insurance reported lower screening rates (39.5%) than those who used publicly-funded insurance (59.4%) or military-covered insurance (54.8%) ($p < 0.001$).

The last column of Table 1 provides estimates of rates of missed cases of IPV based on women's self-report of IPV and screening. In our sample, approximately 48.0% of women who experienced IPV were not screened; overall, 3.6% of the women in the sample experienced IPV but were not screened for it during pregnancy, with variation between states ranging from 1.7% in Maine to 8.0% in Arkansas. Results generally showed higher rates of missed IPV in traditionally disadvantaged groups, despite their higher likelihood of being screened.

Table 2 provides results of multivariate logistic regressions predicting IPV screening. Here we describe results from the full model including state fixed effects. Compared to non-Hispanic white women, Hispanic, black, and American Indian/Alaska Native women were more likely to report having been screened; this result is maintained when controlling for state variation and provider characteristics [OR 1.51 (95% CI 1.33–1.72); OR 1.64 (95% CI 1.41–1.90); and OR 1.51 (95% CI 1.12–2.05), respectively]. Women who had completed college were less likely to be screened than women whose highest education level was a high school degree (OR 0.74; 95% CI 0.65–0.85), and women 40 and older were less likely to be screened compared to 25–29 year-olds (OR 0.78; 95% CI 0.62–0.98). Women who received WIC were more likely to report screening than those who did not (OR 1.26; 95% CI 1.12–1.42). Unmarried women were more likely to be screened than their married peers (OR 1.28; 95% CI 1.15–1.43). Women who reported their pregnancies as
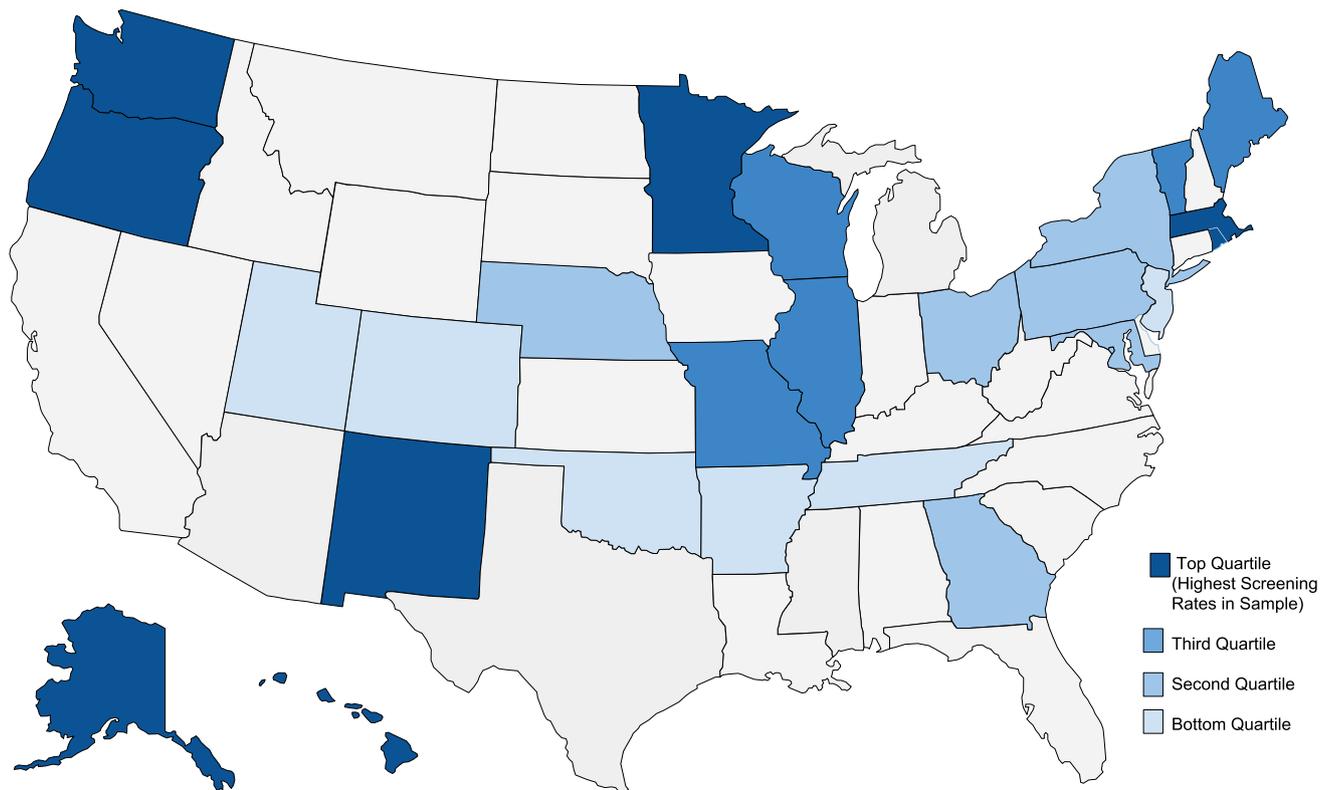
Fig. 1 Unadjusted state IPV screening rates by quartile: PRAMS, 2012

intended were more likely to get screened than those who did not (OR 1.13; 95% CI 1.03–1.23). Women who used publicly- or military-funded insurance were more likely than women using private insurance to report screening, as were women who reported using "other" insurance [OR: 1.25 (95% CI 1.09–1.42); OR 1.44 (95% CI 1.10–1.89); and OR 1.58 (95% CI 1.13, 2.22)]; women without insurance were significantly less likely to be screened than those with private insurance [OR 0.75 (95% CI 0.56–0.99)].

Table 2 also indicates that state variation in screening persists even when controlling for individual covariates. For this analysis, we used Pennsylvania as the reference category because its screening rate falls around the national average. Seven states were significantly more likely to screen than Pennsylvania (Alaska, Maine, Massachusetts, Minnesota, Oregon, Washington, and Wisconsin); and four states were significantly less likely to screen (Arkansas, New Jersey, Oklahoma, Utah).

Table 2, Model 2, shows the full model including state characteristics (rather than state indicators) predicting screening rates. While an array of state characteristics are predictive of screening rates, the substantive size of these associations is small. Proportion of the population in urban areas [OR 0.99 (95% CI 0.98–0.99)], below 200% of the poverty threshold [OR 0.97 (95% CI 0.95–0.98)], and

married [OR 0.95 (95% CI 0.93–0.97)] are negatively associated with screening rates, while the proportion of residents who are white is positively associated with screening [OR 1.01 (95% CI 1.00–1.01)]. The proportion of women served by an FQHC [OR 1.00 (95% CI 1.00–1.00)] is also significantly associated with screening rates. A state mandate for perinatal depression screening or training is positively, significantly, and substantively associated with screening rates [OR 1.14 (95% CI 1.01–1.29)].

Missed IPV

Table 3 presents the results of our logistic regression analyses predicting missed IPV—cases in which women reported IPV (physical violence or reproductive coercion) but not screening. Given the small number of missed cases in the sample, we expected a limited ability to discern significant relationships. We first describe the results from the full model with state fixed effects (Model 1). These state fixed effects allow us to control for any differences, including IPV prevalence, between states; these results, therefore, are not driven by such state differences. Younger women were significantly more likely to report experiencing IPV and not being screened, with those under 18 and between 18 and 19 about twice as likely to be missed compared to

Table 1 IPV screening rates and "Missed" IPV rates by key characteristics: pregnancy risk assessment monitoring system (PRAMS), 2012[a,b]

	Unweighted N	HCW talked about physical abuse (weighted proportion)	"Missed" IPV screen (weighted proportion)
Total	28,581	49.2%	3.6%
Individual characteristics			
Maternal race			
White	13,408	43.7%	3.3%
Hispanic	4854	59.8%***	3.4%
Black	4114	62.8%***	5.3%***
American Indian/AK native	950	63.9%***	4.8%
Asian	2589	41.4%	2.2%***
Other race	1475	50.4%***	6.5%***
Maternal age			
Under 18	674	64.5%***	8.8%***
18–19	1555	59.7%***	8.8%***
20–24	6128	58.8%***	5.4%***
25–29	8199	49.1%	3.1%
30–34	7642	42.6%***	2.3%***
35–39	3450	43.2%***	2.6%
40 and older	932	40.7%***	3.0%
Maternal education			
No high school (< 9 years)	914	55.5%	3.2%***
Some high school (9–11 years)	3265	63.1%***	4.9%
High school completion (12 years)	7201	55.9%	5.4%
Some college (13–15 years)	7772	51.7%***	4.3%***
College degree or higher (16 + years)	9011	37.5%***	1.6%***
Mother received WIC during pregnancy			
Yes	10,073	59.9%***	4.9%***
No	11,670	40.4%	2.7%
Below 2012 poverty threshold			
Yes	8405	59.0%***	6.2%***
No	17,064	43.3%	2.6%
Marital status			
Not married	11,473	60.4%***	6.4%***
Married	17,091	42.3%	2.0%
Pregnancy intentionality			
Intended	15,110	46.3%***	1.4%***
Unintended	13,471	52.7%	6.5%
First prenatal care visit			
1st trimester	22,551	48.8%	3.1%
After 1st trimester	3957	52.0%***	6.7%***
No care	250	24.8%***	7.9%
Health care characteristics			
Insurance type			
Private	12,318	39.5%	2.3%
Public	13,324	59.4%***	5.3%***
Military	752	54.8%***	3.0%
None	955	41.9%	2.7%
Other	512	66.4%***	2.1%
Reported receiving any screening (excluding IPV)			
Yes	27,724	49.8%***	3.6%***
No	292	0.4%	10.9%

Table 1 (continued)

	Unweighted N	HCW talked about physical abuse (weighted proportion)	"Missed" IPV screen (weighted proportion)
States			
Alaska	913	60.0%***	2.8%
Arkansas	820	34.9%***	8.0%
Colorado	1230	46.1%	2.4%*
Georgia	1123	49.1%	3.6%
Hawaii	1488	49.9%	4.0%
Illinois	1085	53.2%	2.4%*
Maine	681	52.8%	1.7%**
Massachusetts	1539	58.1%**	2.4%*
Maryland	945	47.3%	3.2%
Minnesota	952	57.1%**	2.1%**
Missouri	847	51.4%	4.6%
Nebraska	1142	48.5%	3.8%
New Jersey	1073	36.9%***	3.3%
New Mexico	977	62.9%***	3.9%
Ohio	1667	48.1%	4.2%
Oklahoma	1844	42.5%*	5.4%
Oregon	774	58.4%**	2.3%*
Pennsylvania	792	49.4%	4.9%
Rhode Island	1211	55.8%*	2.9%
Tennessee	849	43.3%*	5.4%
Utah	1569	29.9%***	2.4%*
Vermont	1002	49.8%	3.4%
Washington	1008	57.1%**	2.5%*
Wisconsin	1518	53.8%	4.5%
New York City	1532	49.5%	3.5%

*Weighted proportions are significantly different from reference group, $p < 0.05$

**Weighted proportions are significantly different from reference group, $p < 0.01$

***Weighted proportions are significantly different from reference group, $p < 0.001$

[a]Analysis includes sample weights and adjustment for complex survey design

[b]Reference group is in italics

25–29-year-olds [OR 2.03 (95% CI 1.03, 4.00); and OR 1.86 (95% CI 1.22, 2.83), respectively]. Unmarried women's IPV was more likely to be missed [OR 1.99 (95% CI 1.47–2.71)]. IPV among women who intended to become pregnant was less likely to be missed [OR 0.30 (95% CI 0.22–0.40)]. Women who started receiving prenatal care in the first trimester were less likely to experience IPV and not be screened [OR 0.69 (95% CI 0.53–0.90)] compared to those who began prenatal care later or never received it. Women without insurance were less likely to report missed IPV than those with private insurance [OR 0.32 (95% CI 0.12, 0.90)]. While missed IPV is, in part, the result of variation in IPV experience, many of the characteristics that predict being screened are also predictive of missed IPV, meaning that providers' selective screening is still not capturing all cases despite being more likely to screen certain groups.

State variation was evident in missed cases of IPV. In some states higher screening rates overall were coupled with a lower incidence of missed cases of IPV, compared to our reference case of Pennsylvania: Maine and Minnesota. However, Colorado, Hawaii, and Rhode Island were less likely to miss cases but were not statistically more likely than Pennsylvania to screen. The remaining states were not significantly different from Pennsylvania in their likelihood of missing cases of IPV in screening. Table 3, Model 2, shows that state factors—save for FQHCs, which was significantly but not substantively meaningful—were not predictive of a differential risk of missed IPV.

Table 2 Logistic regressions predicting IPV screening: PRAMS, 2012

	Model 1: full model, with state fixed effects[c]	Model 2: full model, with state characteristics
Individual characteristics		
Maternal race/ethnicity		
White	*Reference*	*Reference*
Hispanic	1.51*** (1.33–1.72)	1.42*** (1.25–1.62)
Black	1.64*** (1.41–1.90)	1.52*** (1.30–1.77)
American Indian/AK native	1.51** (1.12–2.05)	1.50** (1.12–2.02)
Asian	1.01 (0.87–1.18)	1.07 (0.92–1.25)
Other race	1.08 (0.85–1.35)	1.20 (0.95–1.51)
Maternal age at birth		
Under 18	1.15 (0.78–1.71)	1.12 (0.76–1.65)
18–19	0.91 (0.72–1.13)	0.88 (0.70–1.11)
20–24	1.09 (0.96–1.24)	1.08 (0.95–1.23)
25–29	*Reference*	*Reference*
30–34	0.93 (0.83–1.03)	0.91 (0.82–1.02)
35–39	0.90 (0.78–1.03)	0.92 (0.80–1.06)
40 and older	0.78* (0.62–0.98)	0.81 (0.63–1.04)
Maternal education level		
No high school (< 9 years)	1.10 (0.84–1.43)	1.04 (0.79–1.37)
Some high school (9–11 years)	1.17 (0.99–1.39)	1.19 (1.00–1.42)
High school completion (12 years)	*Reference*	*Reference*
Some college (13–15 years)	0.94 (0.83–1.06)	0.95 (0.84–1.07)
College degree or higher (16 years +)	0.74*** (0.65–0.85)	0.74*** (0.65–0.85)
Received WIC during pregnancy	1.26*** (1.12–1.42)	1.25*** (1.11–1.42)
Below 2012 poverty threshold	1.10 (0.98–1.24)	1.15* (1.01–1.30)
Not married	1.28*** (1.15–1.43)	1.25*** (1.11–1.40)
Positive pregnancy intention	1.13* (1.03–1.23)	1.13* (1.02–1.24)
Received prenatal care in first trimester	1.13 (1.00–1.28)	1.14* (1.00–1.30)
Reported IPV exposure before/during pregnancy	0.79** (0.67–0.93)	0.77** (0.65–0.91)
Health care characteristics		
Prenatal care insurance provider		
Private insurance	*Reference*	*Reference*
Public	1.25** (1.09–1.42)	1.23** (1.07–1.41)
Military	1.44** (1.10–1.89)	1.43** (1.10–1.87)
No insurance	0.75* (0.56–0.99)	0.68** (0.51–0.90)
Other insurance	1.58** (1.13–2.22)	1.55* (1.08–2.21)
States		
Alaska	1.53** (1.14–2.04)	
Arkansas	0.47*** (0.34–0.65)	
Colorado	0.98 (0.75–1.29)	
Georgia	0.83 (0.61–1.12)	
Hawaii	1.06 (0.81–1.39)	
Illinois	1.10 (0.85–1.42)	
Maine	1.33* (1.00–1.78)	
Massachusetts	1.57*** (1.21–2.04)	
Maryland	0.84 (0.64–1.11)	
Minnesota	1.67*** (1.28–2.17)	
Missouri	1.08 (0.82–1.42)	
Nebraska	1.06 (0.81–1.38)	

Table 2 (continued)

	Model 1: full model, with state fixed effects[c]	Model 2: full model, with state characteristics
New Jersey	0.57*** (0.44–0.75)	
New Mexico	1.29 (0.98–1.69)	
Ohio	0.99 (0.77–1.27)	
Oklahoma	0.67** (0.51–0.88)	
Oregon	1.57** (1.13–2.16)	
Pennsylvania	*Reference*	
Rhode Island	1.28 (1.00–1.65)	
Tennessee	0.75 (0.56–1.00)	
Utah	0.50*** (0.39–0.65)	
Vermont[a]	– (–)	
Washington	1.42* (1.08–1.87)	
Wisconsin	1.36* (1.03–1.80)	
New York City[b]	0.94 (0.72–1.22)	
State characteristics		
Proportion of state residents who live in urban areas		0.99*** (0.98–0.99)
Proportion of state residents with a bachelors' degree		1.00 (0.97–1.02)
Proportion of state residents who are White		1.01*** (1.00–1.01)
Proportion of state residents below 200% of the poverty threshold		0.97*** (0.95–0.98)
Proportion of state residents who are married		0.95*** (0.93–0.97)
Patients served by FQHCs/10,000 women		1.00*** (1.00–1.00)
State has IPV training or screening protocol in place		1.09 (0.99–1.21)
State has mandated perinatal depression screening or training		1.14* (1.01–1.29)
Constant	0.60*** (0.46–0.80)	22.82*** (4.88–106.82)
Observations	22,320	21,214

Odds Ratios, 95% CI in parentheses

***p < 0.001, **p < 0.01, *p < 0.05

[a]Because Vermont data do not contain indicators of race/ethnicity, we exclude them from analyses; results robust to sensitivity analyses in which we impute race status of Non-Hispanic, White for Vermont observations

[b]We also exclude New York City data from the models using state characteristics since state-level characteristics may not apply; results are robust to sensitivity analysis imputing New York-state level indicators

[c]State dummies account for state-specific characteristics, including IPV prevalence, indicating that state variation in IPV screening rates is not driven solely by differences in prevalence of IPV across states. When we test for correlation between screening and prevalence, as reported in PRAMS, the relationship is negative

Discussion

Though current evidence supports recommendations for universal screening, approximately half of women reported not being screened for IPV during pregnancy; this is consistent with previous findings from earlier PRAMS data (Krans et al. 2013). Characteristics associated with social and economic disadvantage were tied to a higher likelihood of being screened; this is consistent with findings of previous PRAMS analyses (Durant et al. 2000; Krans et al. 2013). These characteristics were neither sufficiently sensitive nor specific to ensure effective targeted screening, and approximately half of women who experienced IPV during pregnancy or in the 12 months prior to pregnancy, reported that they were not screened for it during prenatal care. These cases of missed IPV—women experiencing physical violence or reproductive control without being screened—occurred despite the fact that women with missed IPV tended to have characteristics that were associated with a higher likelihood of screening, but even among high risk groups screening rates were not sufficiently robust to identify many IPV cases.

Screening rates varied substantially across states, even controlling for patient characteristics, suggesting other factors influence the content of prenatal care. However, even in states with relatively high screening rates, like New Mexico, Massachusetts, and Minnesota, fewer than two-thirds of women reported being screened. Among state

Table 3 Logistic regressions predicting missed IPV: PRAMS, 2012

	Model 1: full model, with state fixed effects[c]	Model 2: full model, with state characteristics
Individual characteristics		
Maternal race/ethnicity		
White	*Reference*	*Reference*
Hispanic	0.72 (0.50–1.04)	0.70 (0.47–1.03)
Black	0.84 (0.60–1.19)	0.88 (0.61–1.25)
American Indian/AK native	0.64 (0.35–1.17)	0.62 (0.34–1.13)
Asian	1.03 (0.67–1.59)	0.92 (0.58–1.44)
Other race	1.33 (0.81–2.18)	1.24 (0.75–2.05)
Maternal age at birth		
Under 18	2.03* (1.03–4.00)	1.96 (0.97–3.93)
18–19	1.86** (1.22–2.83)	1.95** (1.28–2.99)
20–24	1.30 (0.97–1.74)	1.27 (0.94–1.72)
25–29	*Reference*	*Reference*
30–34	1.02 (0.72–1.44)	1.10 (0.77–1.57)
35–39	1.16 (0.75–1.78)	1.20 (0.76–1.88)
40 and older	1.45 (0.72–2.94)	1.75 (0.86–3.55)
Maternal education level		
No high school (< 9 years)	0.94 (0.46–1.92)	0.72 (0.31–1.65)
Some high school (9–11 years)	0.88 (0.63–1.25)	0.93 (0.65–1.32)
High school completion (12 years)	*Reference*	*Reference*
Some college (13–15 years)	1.00 (0.75–1.33)	1.02 (0.76–1.36)
College degree or higher (16 years +)	0.65 (0.42–1.01)	0.63 (0.40–1.01)
Received WIC during pregnancy	0.82 (0.60–1.11)	0.83 (0.61–1.14)
Below 2012 poverty threshold	1.17 (0.89–1.53)	1.18 (0.89–1.56)
Not married	1.99*** (1.47–2.71)	1.91*** (1.38–2.62)
Positive pregnancy intention	0.30*** (0.22–0.40)	0.30*** (0.22–0.40)
Received prenatal care in first trimester	0.69** (0.53–0.91)	0.68** (0.52–0.90)
Health care characteristics		
Prenatal care insurance provider		
Private insurance	*Reference*	*Reference*
Public	1.00 (0.69–1.44)	1.04 (0.71–1.52)
Military	1.16 (0.54–2.49)	1.25 (0.59–2.65)
No insurance	0.32* (0.12–0.90)	0.37 (0.13–1.06)
Other insurance	0.42 (0.15–1.16)	0.51 (0.18–1.45)
States		
Alaska	0.52 (0.24–1.09)	
Arkansas	1.10 (0.57–2.14)	
Colorado	0.48* (0.23–0.97)	
Georgia	0.65 (0.31–1.36)	
Hawaii	0.39** (0.20–0.77)	
Illinois	0.55 (0.27–1.10)	
Maine	0.28** (0.12–0.65)	
Massachusetts	0.50 (0.24–1.02)	
Maryland	0.70 (0.36–1.38)	
Minnesota	0.36** (0.18–0.75)	
Missouri	0.59 (0.32–1.11)	
Nebraska	0.67 (0.35–1.29)	
New Jersey	0.66 (0.34–1.26)	

Table 3 (continued)

	Model 1: full model, with state fixed effects[c]	Model 2: full model, with state characteristics
New Mexico	0.63 (0.32–1.23)	
Ohio	0.68 (0.38–1.23)	
Oklahoma	0.71 (0.37–1.36)	
Oregon	0.50 (0.21–1.21)	
Pennsylvania	*Reference*	
Rhode Island	0.40** (0.20–0.78)	
Tennessee	0.79 (0.42–1.51)	
Utah	0.54 (0.29–1.00)	
Vermont[a]	– (–)	
Washington	0.52 (0.25–1.09)	
Wisconsin	0.76 (0.40–1.47)	
New York City[b]	0.69 (0.37–1.31)	
State characteristics		
Proportion of state residents who live in urban areas		1.01 (0.99–1.02)
Proportion of state residents with a bachelors' degree		0.97 (0.90–1.04)
Proportion of state residents who are White		1.00 (0.99–1.01)
Proportion of state residents below 200% of the poverty threshold		1.00 (0.95–1.04)
Proportion of state residents who are married		0.97 (0.92–1.02)
Patients served by FQHCs/10,000 women		1.00*** (1.00–1.00)
State Has IPV training or screening protocol in place		0.96 (0.72–1.27)
State has mandated perinatal depression screening or training		0.91 (0.63–1.31)
Constant	0.38* (0.15–1.00)	3.00 (0.03–262.56)
Observations	22,549	21,393

Odds ratios, 95% CI in parentheses

***p < 0.001, **p < 0.01, *p < 0.05

[a]Because Vermont data do not contain indicators of race/ethnicity, we exclude them from analyses; results robust to sensitivity analyses in which we impute race of Non-Hispanic, White for Vermont observations

[b]We also exclude New York City data from the models using state characteristics since state-level characteristics may not apply; results are robust to sensitivity analysis imputing New York-state level indicators

[c]State dummies account for state-specific characteristics, including IPV prevalence, indicating that state variation in rates of missed IPV is not driven solely by differences in prevalence of IPV across states

characteristics, a state mandate for perinatal depression screening protocol or training was significantly and positively associated with IPV screening rates; other state demographic characteristics (proportion of residents who were in urban areas, white, and below 200% of the poverty line) were significantly, but often not substantively, associated with screening rates.

These results point to a need to better understand the barriers to universal screening, including the dynamics in the examining room, and how these are shaped by clinic procedures and state policies. In previous interviews with providers, they reported not screening for IPV due to limited resources, including time constraints, and were concerned about what uncovering an incidence of IPV would entail, given mandated reporting requirements and struggles to respond adequately to disclosed IPV or make appropriate referrals (Garimella et al. 2000; Gerbert et al. 1999; Waalen et al. 2000). However, our results make clear that screening is not occurring randomly; if it were, these resource-related factors and legal concerns would depress screening for all patients equally. Rather, we saw that certain women were more likely to be screened. Further, providers did find the resources to screen for other risk factors, such as medication use, breastfeeding, or illicit substance use (Petersen et al. 2001), so resources alone cannot explain these low levels of IPV screening. Providers may be reluctant to admit that patient characteristics guide their choices about screening, or they may not be aware of it. However, these data show missed opportunities to identify women experiencing IPV who fall into both high and low risk groups. Therefore, providers' objections and barriers to instituting universal screening should be more fully explored. While research

does show the efficacy of screening for identifying IPV (O'Reilly et al. 2010), continuing to build evidence is warranted to give providers confidence in the utility of making efforts to do so.

Limitations

The current study has several limitations. First, PRAMS does not include data on births in all states; given the substantial state-level variation we see in the present study, there is much left to learn about those states for which we lack data. Second, women are often reluctant to disclose their IPV experiences (Lutz 2005; Rodriguez et al. 1998) or to label themselves as victims, which could affect their survey responses. Further, we do not measure emotional, sexual, or other types of abuse (e.g., economic) in these analyses. Therefore, we expect that actual experiences of IPV (and therefore of missed IPV) are underreported in this data. Third, our measure of IPV screening is from the patient's perspective; a provider may have a different view of what constitutes screening (e.g., a provider may ask, "How are things at home?" and see this as IPV screening, while a patient may not). Finally, PRAMS includes a limited set of provider characteristics, restricting our exploration of these factors in predicting IPV screening rates.

Conclusions

Providers appear to be targeting their IPV screening at certain groups of women, like those who are unmarried, as opposed to taking a universal approach. This targeted approach to screening results in cases of women experiencing IPV yet not being screened, even when they do receive prenatal care. While this does not constitute a large proportion of all pregnant women, nationwide this would be equivalent to 142,306 missed cases of IPV among pregnant women each year, which necessitates attention from the public health community. However, because women who experience IPV are less likely to receive adequate prenatal care (Cha and Masho 2014b), universal screening by prenatal care providers will not be enough ensure that we reach all women at risk. In addition to screening efforts in the prenatal care setting, therefore, alternative approaches to outreach and to supporting women during pregnancy are necessary.

Ongoing research explores the efficacy of various approaches to IPV screening and to supporting women experiencing IPV during pregnancy (Bianchi et al. 2016; Fletcher et al. 2016; Van Parys et al. 2014; Waalen et al. 2000). Additional exploration is warranted to discover the best strategies for the achievement of universal screening, with attention to both provider- and systems-level factors.

These may include enhancing provider training; implementing protocols that are reinforced within the electronic medical record, perhaps through incentives or penalities for noncompliance; and systems-level resources providers can deploy to support women who disclose IPV within the health care setting (Dagher et al. 2014).

Researchers should also pursue other tactics for studying these issues. For example, recent legislative changes offer the opportunity to study the impacts of nationwide policy change. Since the period covered by the data in this study (2012), the ACA has expanded Medicaid eligibility and required health insurance providers to cover maternity care and IPV screening, among other changes. The current study should be used as a baseline against which analyses of post-ACA data can be compared to examine how national policy change may play a role in influencing IPV screening in the prenatal period. Of particular interest is whether the states most affected by the ACA's policy changes will show the largest changes in IPV screening; for example, Arkansas had particularly low IPV screening rates in 2012 and used ACA's Medicaid expansion to substantially increase private insurance coverage and health care use (Sommers et al. 2016). Importantly, studies should establish whether such changes increase the likelihood of women receiving appropriate IPV screening and of IPV cases being detected in the prenatal period.

Clinical settings should do a better job of systematically increasing screening, regardless of women's risk factors. In the absence of identification of IPV, women continue to be at risk of physical and emotional harm, stress, and other related factors. By increasing systematic screening and connecting women to desired support services, we have the potential to improve the risk of adverse maternal and child health outcomes.

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