

ARTICLE

Delivery at Catholic hospitals and postpartum contraception use, five US states, 2015–2018

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Abstract

Objectives: To evaluate whether the prevalence of postpartum contraceptive use was lower among people who delivered at a Catholic hospital compared to a non-Catholic hospital.

Methods: We linked 2015–2018 Pregnancy Risk Assessment Monitoring System (PRAMS) survey data from five states to hospital information from the corresponding birth certificate file. People with a live birth self-reported their use of contraception methods on the PRAMS survey at 2–6 months postpartum, which we coded into two dichotomous (yes vs. no) outcomes for use of female sterilization and highly-effective contraception (female/male sterilization, intrauterine device, implant, injectable, oral contraception, patch, or ring). We conducted multilevel log-binomial regression to examine the relationship between birth hospital type and postpartum contraception use adjusting for confounders.

Results: Prevalence of female sterilization for people who delivered at a Catholic hospital was 51% lower than that of their counterparts delivering at a non-Catholic hospital (adjusted prevalence ratio: 0.49; 95% confidence interval: 0.37–0.65).

Conclusion: We found lower use of postpartum female sterilization, but no difference in highly effective contraception overall, for people who delivered at a Catholic hospital compared to a non-Catholic hospital.

KEYWORDS

Catholic health care, highly-effective contraception, postpartum contraception, PRAMS, religious health care

INTRODUCTION

Between 2001 and 2016, hospital mergers and acquisitions in the United States led to a 22% increase in the number of Catholic acute care hospitals, which now account for an estimated 17% of all acute care hospital beds.^{1,2} Catholic hospitals that follow the Ethical and Religious Directives for Catholic Health Care Services are prohibited from providing abortion, infertility treatment, and contraceptive

counseling or method provision except for fertility-awareness based methods (i.e., those involving timing intercourse to avoid the fertile window).³

If people who deliver at Catholic hospitals do not receive contraceptive counseling and method provision, they could be at higher risk of another birth following a short interpregnancy interval, defined as less than 18 months between delivery of live birth and conception of a subsequent pregnancy. Short interpregnancy intervals are

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associated with adverse maternal and infant outcomes including pre-eclampsia, neonatal morbidity, and preterm birth.^{4,5} Preventing short interpregnancy intervals and unintended pregnancies are identified as high priorities in the 2030 Healthy People Objectives set by the U.S. Department of Health and Human Services.⁶ We sought to describe the demographic characteristics of people delivering at Catholic and non-Catholic hospitals. Additionally, we aimed to evaluate whether contraceptive prevalence was lower among postpartum people who delivered at a Catholic hospital compared to those who delivered at a non-Catholic hospital.

MATERIALS AND METHODS

Data source

We linked Pregnancy Risk Assessment Monitoring System (PRAMS) data from 2015 to 2018 to the corresponding birth hospital data derived from birth certificates. PRAMS is an annual surveillance initiative administered jointly by the Centers for Disease Control and Prevention (CDC) and state health departments.⁷ Using jurisdiction-specific birth certificate files as the sampling frame, PRAMS sites (currently in 47 states and New York City, Puerto Rico, and the District of Columbia) survey a stratified, random sample of postpartum people approximately 2–6 months after delivery of a live birth. All sites include a core set of questions, which enables state comparisons. Of

the sites that had 2015 PRAMS data available for release, Catholic hospitals accounted for at least 15% of state hospital beds⁸ in 17 states: Alaska, Arkansas, Colorado, Connecticut, Illinois, Iowa, Louisiana, Maine, Michigan, Missouri, Nebraska, New Hampshire, New Jersey, Oklahoma, Oregon, Washington, and Wisconsin. We requested access from these 17 states to their 2015–2018 PRAMS records, including the hospital of birth, a variable from the birth certificate. One state (Wisconsin) included a Catholic/non-Catholic hospital variable in the PRAMS dataset in lieu of providing the hospital name/address. Our analysis is limited to the five states that approved this request for the linked birth hospital data: Alaska, Illinois, Maine, Oregon, and Wisconsin. Oregon supplied data for 1 year (2015) and Wisconsin supplied data for 3 years (2015–2017). The remaining states had data for all 4 years. PRAMS response rates by state and year ranged from 56% to 66%.

Exposure, outcome, and confounders

The exposure of interest was Catholic affiliation of the birth hospital. We classified hospitals as “Catholic” or “non-Catholic” using a publicly available dataset for Catholic facility affiliation.² We evaluated two dichotomous (yes vs. no) primary outcomes of interest: (1) female sterilization (female sterilization only); and (2) highly-effective contraceptive methods (female/male sterilization, intrauterine device [IUD], implant, injectable, oral contraception, patch, or ring).⁹ We decided a

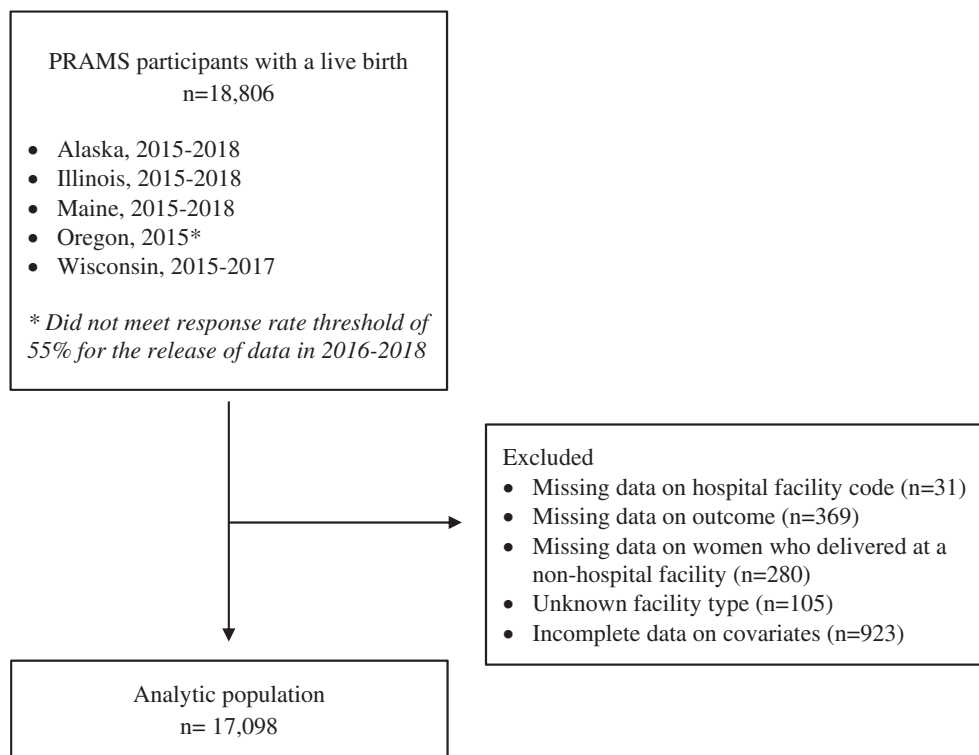


FIGURE 1 Flowchart of study participants

TABLE 1 Characteristics of people with a live birth by Catholic-affiliated status of delivery hospital, PRAMS 2015–2018, Alaska, Illinois, Maine, Oregon, and Wisconsin (N = 17,098)

Characteristic	Catholic hospital (n = 4683)		Non-Catholic hospital (n = 12,415)		p-value ^a
	n	%	n	%	
Age in years					0.0001
<18	79	1.4	149	1.0	
18–24	1152	24.3	2805	20.0	
25–34	2633	58.3	7345	60.1	
≥35	819	16.0	2116	18.9	
Marital status					<0.00005
Married	2583	56.0	7311	62.9	
Unmarried	2100	44.0	5104	37.2	
Race/ethnicity					<0.00005
Non-Hispanic white	1845	54.7	6564	62.6	
Non-Hispanic Black	1113	14.6	1607	12.5	
Other	1725	30.7	4244	25.0	
Education completed					<0.00005
Less than high school	620	14.5	1401	10.7	
High school	1238	26.6	3266	22.9	
More than high school	2825	58.9	7748	66.4	
Body mass index ^b					0.03
<25 kg/m ²	1546	46.5	5137	50.4	
25.0 to <30 kg/m ²	790	26.5	2526	25.3	
≥30 kg/m ²	836	27.0	2542	24.3	
Parity before index birth					0.008
Parous	2927	65.0	7472	61.5	
Nulliparous	1756	35.0	4943	38.5	
Health insurance					<0.00005
Medicaid	2174	44.2	4888	34.8	
Private	1710	38.3	5281	50.1	
Other	400	8.2	1173	6.9	
Uninsured	399	9.3	1073	8.3	
Delivery method ^c					0.24
Vaginal	3131	71.9	8540	70.4	
Cesarean section	1551	28.1	3870	29.6	

Abbreviation: PRAMS, Pregnancy Risk Assessment Monitoring System.

^aRao-Scott χ^2 test (second order correction).

^bn = 13,377; data not available for Wisconsin and body mass index missing for 426 people.

^cn = 17,092; data missing for six people.

priori to focus on highly effective contraception as these methods play a key role in reducing the risk of closely spaced pregnancies.¹⁰ We evaluated female sterilization alone because accessing this

outside of the delivery hospital could be difficult for postpartum people. Note that we use the term “female sterilization” to specify the type of permanent contraception (i.e., to exclude male sterilization/vasectomy); the category encompasses those who do not identify as female but who have undergone a tubal occlusion or excision. We derived the outcomes from the PRAMS core question: “Are you or your husband or partner doing anything now to keep from getting pregnant?” Participants who responded “yes” were asked “What kind of birth control are you or your husband or partner using now to keep from keep pregnant?” Response options consisted of the following: “Tubes tied or blocked (female sterilization or Essure[®]), vasectomy (male sterilization), birth control pills, condoms, shots or injections (Depo-Provera[®]), contraceptive patch (OrthoEvra[®]) or vaginal ring, (NuvaRing[®]), IUD (including Mirena[®], ParaGard[®], Liletta[®], or Skyla[®]), contraceptive implant in the arm (Nexplanon[®] or Implanon[®]), natural family planning (including rhythm method), withdrawal, not having sex or other.” Those who responded “other,” were asked to specify the method. We categorized those write-in responses as according to the method described.

We controlled for the following factors that have been identified as possible confounders of the relationship between birth hospital type and postpartum contraception use: maternal age (<18, 18–24, 25–34, 35+ years), race/ethnicity (non-Hispanic Black, non-Hispanic White, other), parity (parous, nulliparous), education (less than high school, high school, more than high school), and postpartum insurance coverage (Medicaid, private, other, uninsured).^{11–13} Other race included individuals who identified as Hispanic, Asian, American Indian, Pacific Islander, or multi-or bi-racial. We derived maternal age, race/ethnicity, education, and parity from birth certificate data.

Statistical analysis

Using 2015–2018 PRAMS data, we conducted descriptive analyses to identify characteristics of people who delivered a live birth at a Catholic hospital. To account for nesting (i.e., people within hospitals), we performed separate multilevel log-binomial regression models to examine the association between birth hospital type and, the two contraceptive outcomes (i.e., female sterilization and highly effective contraception). Proper fitting of multilevel models using complex sample data requires sampling weights at all levels, in this case people (Level 1) and hospitals (Level 2).¹⁴ However, because PRAMS uses a single level stratified sampling design (sampling people directly, not people with hospitals), we did not have sampling weights for hospitals. Thus, we assigned each (sampled) hospital a weight of one and we then rescaled the person-level weights to sum to the sample size within each hospital.¹⁵ We report both unadjusted and adjusted estimates for each measure of postpartum contraception. We report descriptive statistics for people who reported female sterilization, stratified by birth hospital type. We used STATA 16.0 to conduct all analyses (Stata Corp., College Station, Texas). The Ohio State University institutional review board and CDC PRAMS team approved the analysis.

TABLE 2 Prevalence and odds of postpartum contraception use by birth hospital type, PRAMS 2015–2018, Alaska, Illinois, Maine, Oregon, and Wisconsin ($N = 17,098$)

Outcome	N	% ^a	Unadjusted		Adjusted	
			PR	(95% CI)	PR ^b	(95% CI)
Female sterilization ^c						
Catholic hospital	320	4.1	0.52	(0.39–0.70)	0.49	(0.37–0.65)
Non-Catholic hospital	1164	8.8	1.0	Referent	1.0	Referent
Highly-effective contraception ^d						
Catholic hospital	2542	52.3	0.97	(0.90–1.04)	0.96	(0.90–1.03)
Non-Catholic hospital	6975	54.0	1.0	Referent	1.0	Referent

Abbreviations: CI, confidence interval; PR, Prevalence ratio; PRAMS, Pregnancy Risk Assessment Monitoring System.

^aUnadjusted weighted prevalence.

^bAdjusted for maternal age (4-level), race/ethnicity (3-level), education (3-level), insurance status (4-level), and parity (2-level).

^cDefined as female sterilization.

^dDefined as female or male sterilization, intrauterine device, contraceptive implant, injectable contraception, oral contraception, patch, or ring.

RESULTS

Among the five states, 18,807 people had a live birth and completed a PRAMS survey in 2015–2018 (Figure 1). We excluded people who delivered at a nonhospital facility (e.g., birthing center) and those who were missing data on birth hospital, confounders, or postpartum contraception use, resulting in a final sample of 17,098 people. People who delivered at a Catholic hospital were younger and more likely to be unmarried, non-white, parous, and obese, more likely to have a high school education or less, and less likely to have private insurance compared to people who delivered at a non-Catholic hospital (Table 1).

Overall, 4.1% of people who delivered at a Catholic hospital reported female sterilization compared to 8.8% of those delivering at a non-Catholic hospital (Table 2). After adjusting for maternal age, race/ethnicity, parity, education, and postpartum insurance status, the prevalence of female sterilization for people who delivered at a Catholic hospital was 51% lower than that of people who delivered at a non-Catholic hospital (aPR: 0.49; 95% CI: 0.37–0.65). In contrast, the prevalence of use of any highly-effective method (including female sterilization) did not differ between those who delivered at a Catholic (52.3%) compared to a non-Catholic hospital (54.0%) (aPR: 0.96; 95% CI: 0.90–1.03).

Among people who reported female sterilization, most of the participant characteristics evaluated did not differ by birth hospital type (Table 3). The two exceptions were that higher proportions of people with female sterilization who delivered at a Catholic hospital received Medicaid (65.9%) and had a vaginal delivery (51.9%) compared to the proportions with female sterilization who delivered at a non-Catholic hospital who received Medicaid (49.0%) and had a vaginal delivery (38.7%) ($p = 0.003$; $p = 0.02$, respectively). Oral contraception and IUD were the most prevalent contraceptive methods (Table S1).

DISCUSSION

Findings from this population-based study of five states in 2015–2018 revealed that the prevalence of female sterilization among

people who recently delivered at a Catholic hospital was roughly half that of their counterparts who delivered at a non-Catholic hospital. In contrast, prevalence of postpartum use of any highly effective contraceptive use did not differ by birth hospital type. People who delivered at a Catholic hospital differed by key demographics and other characteristics compared to people who delivered at other facilities in that they were younger and higher proportions were parous, unmarried, and non-white, had less education, and reported lower rates of private insurance.

Contrary to our hypotheses, we did not find differences in the prevalence of highly-effective methods of contraception at 2–6 months postpartum by birth hospital type. Participants might have obtained contraception from other sources (e.g., at the recommended 6-week postpartum visit) and not have relied on the receipt of contraception during their hospital stay. It is also possible that hospitals following the Ethical and Religious Directives for Catholic Health Care Services could have provided a highly-effective, hormonal method (but not female sterilization or other nonhormonal methods) for non-contraceptive purposes, such as managing menorrhagia.¹⁶

Public health implications

The disparity in use of female sterilization among people who delivered at a Catholic hospital is important for several reasons. First, in light of the increasing proportion of hospitals with Catholic affiliation due to mergers,^{1,2} many postpartum people who want female sterilization might lack access to the procedure during delivery or immediately postpartum.¹⁷ The immediate postpartum period is a convenient time to perform sterilizations and can reduce the barriers for patients who otherwise would need to return for the procedure. About half of all female sterilizations in the United States are performed postpartum.¹⁸ Overall, an estimated 8%–9% of hospital deliveries are followed by female sterilization,¹⁸ which is consistent with the prevalence of 8.8% found in non-Catholic hospitals in the present analysis. Failure to obtain a desired sterilization could place people at risk of a

TABLE 3 Characteristics of people with a live birth who reported use of female sterilization by birth hospital type, PRAMS 2015–2018, Alaska, Illinois, Maine, Oregon, and Wisconsin (N = 1484)

Characteristic	Catholic hospital (n = 320)		Non-Catholic hospital (n = 1164)		p-value ^a
	n	%	n	%	
Age in years					0.70
<25	32	8.9	92	6.8	
25–34	189	59.9	700	58.9	
≥35	99	31.2	372	34.4	
Marital status					<0.41
Married	172	58.2	638	53.4	
Unmarried	148	41.8	526	46.6	
Race/ethnicity					<0.98
Non-Hispanic white	85	49.2	565	49.0	
Non-Hispanic Black	99	16.0	175	15.3	
Other	136	34.8	424	35.7	
Education completed					<0.06
Less than high school	54	13.2	201	21.7	
High school	88	26.8	389	30.7	
More than high school	178	60.1	574	47.7	
Body mass index ^b					0.99
<25 kg/m ²	70	32.1	327	33.1	
25.0 to <30 kg/m ²	55	26.5	238	25.9	
≥30 kg/m ²	65	41.4	375	41.0	
Parity before index birth					0.38
Parous	305	96.2	1112	97.6	
Nulliparous ^c	--	--	52	2.4	
Health insurance					0.003
Medicaid	192	65.9	596	49.0	
Private	82	24.1	348	30.9	
Other/uninsured	46	9.9	220	20.1	
Delivery method ^d					0.02
Vaginal	123	51.9	464	38.7	
Cesarean section	197	48.1	700	61.3	

Abbreviation: PRAMS, Pregnancy Risk Assessment Monitoring System.

^aRao-Scott χ^2 test (second order correction).

^bn = 1130; data not available for Wisconsin and body mass index missing for 34 people.

^cEstimates suppressed due to small cell size.

^dCombined other and uninsured due to small numbers among those attending a Catholic hospital.

rapid, subsequent pregnancy: a chart review found that 47% of people who did not receive a requested postpartum sterilization became pregnant within 1 year, which was twice the fraction of people who did not request sterilization.¹⁹ Results from another chart review further suggest differences by insurance status. Specifically, among individuals who did not receive a requested postpartum sterilization, those covered by Medicaid were more likely to have a rapid, subsequent

pregnancy compared to people with private insurance.²⁰ Furthermore, the Catholic status of hospitals might not be evident; a national survey of adult, reproductive-age people revealed that 37% of people whose primary hospital was Catholic were unaware of its Catholic status.²¹ Also, many people do not realize that attending a Catholic hospital could restrict the scope of care that they can receive.²² Finally, some people are constrained geographically to attend a Catholic hospital for delivery and have no other feasible options.¹

Alternatively, we cannot rule out that the lower prevalence of female sterilization among people attending a Catholic hospital stemmed from lower levels of reproductive coercion among providers at these religious hospitals. Historically, people have been subject to “stratified” reproduction, in which state institutions and providers have deemed certain races/ethnicities, nationalities, classes, and genders as unfit to reproduce and parent.²³ In the United States, people living on low incomes, people of color, people with intellectual disabilities, and those who are incarcerated have undergone involuntary (either forced or coerced) sterilization.^{24–26} This continues to the present time, for example, with allegations of forced sterilizations occurring among detainees at U.S. Immigration and Customs Enforcement camps.²⁷ Further, 2015–2017 data from the National Survey of Family Growth show people with lower incomes and education remain more likely to use a permanent method compared to a long-acting reversible method.²⁸ We lack data to disentangle whether the lower prevalence of female sterilization in Catholic hospitals is attributable to an infringement of people’s rights to receive their desired method or from Catholic hospitals respecting a lower demand for female sterilization. Future research to elucidate the differences in preferences regarding female sterilization is needed.

Anecdotal evidence suggests that Catholic hospitals might circumvent their religious directives against contraception provision by placing IUDs for noncontraceptive purposes or by performing elective cesarean deliveries in order to surreptitiously carry out tubal ligation or by advocating for female sterilization after a patient has undergone multiple cesarean section deliveries on the grounds that it is medically indicated for the patient.^{16,29} However, we found no evidence of such practices. First, we found no difference by Catholic hospital status for the provision of highly effective contraception, evaluated with and without IUDs included in the method mix. Furthermore, if cesarean deliveries were being performed as a work-around, we would have expected higher proportions of cesarean deliveries among those reporting female sterilization at a Catholic hospital compared to those reporting female sterilization at a non-Catholic hospital. We discovered, though, a statistically significantly lower prevalence of cesarean sections performed among those reporting female sterilization at a Catholic hospital.

Strengths and limitations

The PRAMS data used in this study were representative of the population of people with a recent live birth in the included states. Linking the PRAMS data to the postpartum person’s birth certificate data to capture the type of birth hospital provides a novel source of data to

evaluate the association between birth hospital type and postpartum contraception use. Our study has several limitations, which are important to consider when interpreting findings. A primary study limitation is the potential for exposure misclassification. We used a publicly available dataset for classifying the status of hospitals with respect to Catholic affiliation; however, we may have failed to capture hospital mergers that occurred during the study period. Additionally, we were not able to capture whether Catholic hospitals followed the Ethical and Religious Directives. However, misclassification of Catholic status (actual and adherence to directives) would be expected to bias our findings toward the null. Thus, our finding of a lower prevalence of female sterilization among those delivering at a Catholic hospital is unlikely to be explained by misclassification. Additionally, PRAMS postpartum contraception data are self-reported by respondents and do not specify the timing of the contraception provision; thus, postpartum female sterilization procedures may not necessarily have occurred at the delivery hospital. We were not able to control for confounding due to unmeasured factors such as self-selection of delivery hospital; it is possible that people who do not want to use female sterilization self-select into Catholic hospitals. However, evidence suggests that women often are not aware of the Catholic affiliation of their hospital²¹ and the proscription against contraception use does not appear to reduce contraception use in the general population of Catholic people.³⁰ Finally, data for these analyses were limited to five states, and these results may not be generalizable to the rest of the United States.

CONCLUSIONS

Our analysis of population-based survey and birth record data showed lower use of female sterilization among people delivering at a Catholic compared to a non-Catholic hospital. Additionally, use of highly effective contraception did not differ between our exposure groups. Per the American College of Obstetrics and Gynecologists, if religious beliefs prevent an institution or provider from performing postpartum sterilization, they should notify their patients early and offer to transfer them for the remainder of the pregnancy.³¹ Qualitative research, though, has described institutional barriers against providing referrals to non-Catholic facilities.³² Future research should examine whether postpartum people are using their desired contraceptive method and whether this differs by the type of hospital where they delivered.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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