

By Caroline S. Carlin, Angela R. Fertig, and Bryan E. Dowd

DOI: 10.1377/hlthaff.2015.1457  
HEALTH AFFAIRS 35,  
NO. 9 (2016): 1608–1615  
©2016 Project HOPE—  
The People-to-People Health  
Foundation, Inc.

# Affordable Care Act's Mandate Eliminating Contraceptive Cost Sharing Influenced Choices Of Women With Employer Coverage

**Caroline S. Carlin** (caroline.carlin@medica.com) is a research investigator at Medica Research Institute, in Minneapolis, Minnesota.

**Angela R. Fertig** is a research investigator at Medica Research Institute.

**Bryan E. Dowd** is a professor in the Division of Health Policy and Management at the University of Minnesota, in Minneapolis.

**ABSTRACT** Patient cost sharing for contraceptive prescriptions was eliminated for certain insurance plans as part of the Affordable Care Act. We examined the impact of this change on women's patterns of choosing prescription contraceptive methods. Using claims data for a sample of midwestern women ages 18–46 with employer-sponsored coverage, we examined the contraceptive choices made by women in employer groups whose coverage complied with the mandate, compared to the choices of women in groups whose coverage did not comply. We found that the reduction in cost sharing was associated with a 2.3-percentage-point increase in the choice of any prescription contraceptive, relative to the 30 percent rate of choosing prescription contraceptives before the change in cost sharing. A disproportionate share of this increase came from increased selection of long-term contraception methods. Thus, the removal of cost as a barrier seems to be an important factor in contraceptive choice, and our findings about long-term methods may have implications for rates of unintended pregnancy that require further study.

**T**he Affordable Care Act (ACA) mandated that, starting in late 2012, private health insurance plans not grandfathered or otherwise exempt were required to cover, without patient cost sharing, all contraceptive methods approved by the Food and Drug Administration to be prescribed for women. It has been estimated that this mandate saved women between \$483 million and \$1.4 billion in out-of-pocket spending on birth control pills in 2013.<sup>1,2</sup> This mandate also has the potential to reduce health care expenditures by decreasing the number of unintended pregnancies and thereby the costs associated with these pregnancies.<sup>3,4</sup> Because unwanted pregnancy is associated with poor birth outcomes,<sup>5</sup> the mandate also has the potential to reduce the number of high-cost births and infants born in poor health.

The societal cost savings attributable to the

mandate depend on the extent to which women respond to the change in out-of-pocket spending on contraceptives. Previous studies have shown that before the mandate, women's contraception decisions did respond to price changes—especially for long-term methods of contraception, such as intrauterine devices (IUDs), contraceptive implants, and sterilization, which have high one-time out-of-pocket spending relative to shorter-term methods.<sup>6,7</sup>

Long-term methods may gain market share when price differences between short- and long-term methods are no longer a factor. Long-term methods have significantly higher effectiveness rates than short-term methods such as the pill, the hormone patch, or the vaginal ring.<sup>8</sup> Also, recent improvements in IUDs have reduced the safety concerns that were prevalent in the 1970s.<sup>9</sup> As a result, we hypothesized that the ACA mandate would increase not only overall rates of pre-

scription contraception, but also the probability that women would choose long-term contraceptive methods—even beyond the current trend of increasing choice of such methods.

To test these hypotheses, we investigated the effect of the ACA-induced change in cost sharing for contraceptives on the rate of choosing prescription contraceptives, as well as on the choice of long- versus short-term contraceptive methods.<sup>10</sup> To our knowledge, this is one of the first studies to examine the effect of the ACA contraception mandate on women's decisions about contraception and the first to use longitudinal data (following a group of women over time) with a control group to look at the effect of reducing cost sharing to zero on women's decisions about prescription contraceptive methods. Another article in this issue of *Health Affairs* examines the early impact of the ACA on decisions by women with employer-sponsored insurance who were initiating use of oral contraceptives.<sup>11</sup>

## Study Data And Methods

For this analysis we used longitudinal claims data from a regional health plan operating in the upper Midwest. The sample consisted of 29,990 women ages 18–46 enrolled in insurance plans obtained through 499 employer groups with at least fifty enrollees. To be included in the study, the women had to be ages 18–46 during the entire observation period and to have at least one year-end observation of contraceptive choice before and one observation after the change in cost sharing (or before January 2013 and in January 2013 or later for the control group). We excluded women younger than age 18 because they are more likely than older women to obtain prescription contraceptives from a source not reimbursed by their health plan (for example, Planned Parenthood), in an effort to keep their contraception status confidential from their parents.<sup>12</sup>

Medical and pharmacy claims for the period 2008–14 were extracted for women in the sample. All employer groups in the sample offered contraceptive coverage (with varying degrees of cost sharing) throughout the entire study period. We observed the same women before and after ACA-induced changes in contraception cost sharing, creating a panel data set. We restricted our observations to these women to avoid confounding changes in the population with the impact of the reduced cost sharing.

Employer-specific dates of compliance with the ACA requirements for contraceptive coverage aligned with the employer's health insurance contract renewal date, and they ranged from January 2012 through September 2014. Addi-

tional details about ACA compliance dates and identification of contraceptive choice are provided in the online Appendix.<sup>13</sup>

The treatment group consisted of women covered by one of the 486 employers that eliminated out-of-pocket spending for prescription contraception. The control group consisted of women covered by one of the 13 employers that had not complied with the ACA mandate as of September 2014.<sup>14</sup>

Additional statistical identification of the effect of eliminating cost sharing was provided by the variance in compliance dates among employers in the treatment group—those that complied with the ACA mandate. These employers' dates for eliminating contraceptive cost sharing were as follows: 2012, 13 percent; January 2013 (most employers renew their insurance contracts in January), 62 percent; February–December 2013, 23 percent; and January–September 2014, about 1 percent.

**MEASURES** We identified each woman's contraception choice (including the choice of no prescription contraceptive) as of the end of each plan year, capturing a total of 151,499 observations over this seven-year period, and we categorized the choices into short- and long-term contraceptive methods. Changes in contraceptive status were captured through differences in status from one year's end to the next.<sup>15</sup>

Short-term methods were oral contraceptive, hormone patch, vaginal ring, diaphragm or cervical cap, and injectable hormones. Emergency contraception was observed only rarely in the claims data, likely because it is available over the counter, and thus was not included in our analysis. The long-term methods we studied were contraceptive implants, IUDs or intrauterine systems, and sterilization. We categorized observations as having no prescription contraception if we did not observe protection that was effective as of the end of the plan year.

Long-term protection methods were difficult to identify, and we may not have identified all of the women who chose those methods. In addition to looking for *Current Procedural Terminology*, Fourth Edition (CPT-4), procedure codes that identified sterilization, we searched for *International Classification of Diseases*, Ninth Revision (ICD-9), code V26.51, indicating previous tubal ligation, to identify women who had received the procedure before our window of observation. We also used the indication of IUD or implant removal to impute the previous presence of these devices for up to five years before removal, when our window of observation began within five years of the removal.

The only observable enrollee characteristics in the administrative data were age and employee

or dependent status. Thus, we could not precisely adjust for race/ethnicity, whether the woman was in a long-term relationship, the presence of other children, or socioeconomic status.

However, we were able to include characteristics of the enrollee's neighborhood and adjust for time-invariant unobservable individual characteristics. The neighborhood characteristics included the percentage of the population that was non-Hispanic white and that had an income below the federal poverty level, and the percentage of the population ages twenty-five or older that had less than a high school diploma or equivalent but no college degree.<sup>16</sup> We also included a quadratic quarterly time trend to capture secular trends in contraception choice.

**EMPIRICAL STRATEGY** We employed a difference-in-differences framework that compared the experience of the treatment group to that of the control group over time. We used the following three categories of contraception choice: no prescription contraceptive protection, a short-term method, and a long-term method. We modeled these categories using a multinomial probit regression, with individual random ef-

fects to control for the woman's time-invariant unobserved characteristics. Additional details about our model are available in the Appendix.<sup>13</sup>

A test of precompliance contraceptive choice showed no significant difference in trend between treatment and control groups. This is important, since a difference in the pretreatment trend would indicate that a difference-in-differences framework was inappropriate.

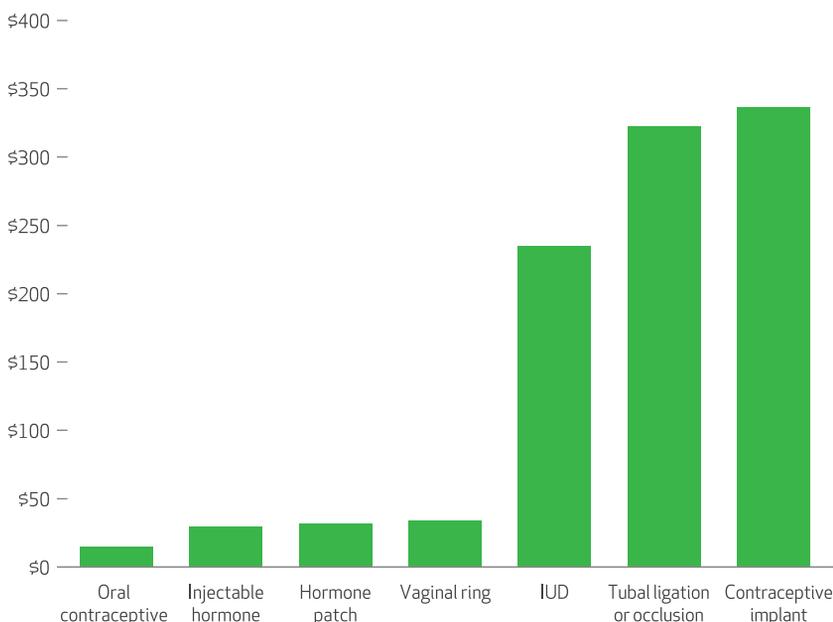
**LIMITATIONS** Our study had several limitations. First, our sample was drawn from the upper Midwest and thus captured the prices and the cultural attitudes about the choice of contraception in that particular region. Our data could reflect higher compliance rates with the ACA mandate in the upper Midwest or within the health plan whose data we used, compared to the national average. Thus, while this study sampled a broad cross-section of the privately insured population, additional evaluations in other markets are needed to gain a complete understanding of the impact of cost sharing on contraceptive choices.

Second, in addition to these regional differences, our inability to fully identify the sterilization status of the insured woman or her partner, to detect the use of over-the-counter methods of birth control, or to detect the use of low-cost generic prescription birth control paid fully out of pocket by the woman meant that we had an incomplete picture of birth control choices in our data. If these other methods of birth control varied in a systematic way between the treatment and control groups and the differences were not time invariant, they might introduce bias into our estimation of the impact of reduced cost sharing. However, our measurement of prescription contraceptive choices should in general be more accurate than self-reported data, because it was based on actual claims data.

Finally, it is important to recognize that cost sharing for other preventive care services (such as wellness exams) was eliminated simultaneously with cost sharing for contraceptive care. Some of the changes in contraceptive choices could be a secondary effect of increased physician encounters for other preventive services, instead of simply the effect of changes in contraceptive cost sharing.

## EXHIBIT 1

**Patients' out-of-pocket spending for contraceptive care, by method, before employer compliance with the Affordable Care Act's contraception mandate**



**SOURCE** Authors' analysis of claims data for 2008–14 provided by a regional health plan in the upper Midwest. **NOTES** Because the days supplied in each fill of a prescription can vary, out-of-pocket expenditures for oral contraceptives, hormone patches, and vaginal rings were normalized to a twenty-eight-day supply. Injectable hormones are effective for ninety days; intrauterine devices (IUDs) and contraceptive implants are effective for three to five years; and tubal ligation or occlusion is a permanent method of contraception. The period before employer compliance with the mandate is 2008–12.

## Study Results

**DESCRIPTIVE RESULTS** Before employer compliance with the contraception mandate, cost sharing for short-term contraceptive methods occurred more frequently than cost sharing for long-term methods but was much lower overall (Exhibit 1). Though total cost sharing for long-term methods may have been lower in the long

run, these methods had a significantly higher upfront cost than short-term options before employer compliance with the ACA mandate. The average amounts shown include the lack of cost sharing for some contraceptives, which occurred most often because other expenses caused the woman to reach her annual cap on out-of-pocket spending. For example, before employer compliance with the ACA mandate, on average across treatment and control groups, 6 percent of prescriptions for oral contraceptives were filled with no cost sharing, compared to 92 percent of prescriptions after compliance.

For a trend comparison, the control group was split into observations before January 2013—the

most common date for ACA compliance within the treatment group—and January 2013 and after. The control group had a slightly lower rate of choosing prescription contraceptives in the pre-ACA period, compared to the treatment group (26.4 percent versus 30.2 percent) (Exhibit 2). When we averaged across treatment and control groups, 23.1 percent of women used short-term methods, and 5.3 percent used long-term ones (data not shown). Both groups had increased rates of choosing a prescription contraceptive over time, with a shift toward long-term methods.

The share of women in the treatment group with a prescription contraceptive who chose a

## EXHIBIT 2

**Characteristics of women covered by an employer that eliminated out-of-pocket spending for prescription contraception (treatment group) and women covered by an employer that had not eliminated such spending as of September 2014 (control group)**

	Treatment group (27,113 unique women)			Control group (2,877 unique women)		
	Before compliance	After compliance	Overall	Before January 2013	January 2013 and after	Overall
Number of observations	82,200	49,506	131,706	15,810	3,983	19,793
<b>CONTRACEPTIVE CHOICES (PERCENT OF OBSERVATIONS)</b>						
No prescription contraceptive	69.8%	69.0%	69.5	73.6%	70.9%	73.1%
Any prescription contraceptive	30.2	31.0	30.5	26.4	29.1	26.9
Short-term <sup>a</sup>	24.6	21.2	23.3	21.8	21.1	21.6
Long-term <sup>b</sup>	5.6	9.8	7.2	4.6	8.0	5.3
<b>AGE RANGE, YEARS (PERCENT OF OBSERVATIONS)</b>						
18–21	3.3%	0.0%	2.1%	2.1%	0.0%	1.7%
22–25	12.3	7.7	10.6	9.4	5.2	8.6
26–30	21.4	18.8	20.4	21.0	18.5	20.5
31–35	25.0	24.2	24.7	23.8	22.6	23.6
36–40	26.3	23.7	25.3	30.7	24.6	29.4
41–46	11.7	25.6	16.9	13.0	29.1	16.3
<b>RELATION TO BENEFICIARY (PERCENT OF OBSERVATIONS)</b>						
Self	58.7%	61.1%	59.6%	88.9%	87.6%	88.6%
Dependent	41.3	38.9	40.4	11.1	12.4	11.4
Spouse	32.9	32.5	32.8	8.3	9.9	8.6
Other	8.4	6.4	7.7	2.8	2.5	2.8
<b>PERCENT OF NEIGHBORHOOD POPULATION:</b>						
Non-Hispanic white	82.1%	82.1%	82.1%	86.8%	86.1%	86.7%
With less than high school diploma <sup>c</sup>	7.2	7.1	7.2	7.4	7.4	7.4
With high school diploma or GED <sup>c</sup>	24.9	24.5	24.8	27.1	26.5	27.0
With at least some college <sup>c</sup>	67.9	68.4	68.1	65.5	66.1	65.6
With income below poverty	9.4	9.2	9.3	9.8	9.8	9.8
<b>NO. OF OBSERVATIONS BY YEAR</b>						
2008	9,493	0	9,493	1,836	0	1,836
2009	10,689	0	10,689	2,275	0	2,275
2010	13,992	0	13,992	2,830	0	2,830
2011	17,133	0	17,133	3,696	0	3,696
2012	25,571	1,076	26,647	5,131	0	5,131
2013	5,295	24,627	29,922	0	2,960	2,960
2014	27	23,803	23,830	0	1,065	1,065

**SOURCE** Authors' analysis of claims data for 2008–14 provided by a regional health plan in the upper Midwest. **NOTES** "Compliance" refers to employer compliance with the Affordable Care Act's contraception mandate. Employer-specific dates of compliance aligned with the employer's health insurance contract renewal date, which ranged from January 2012 through September 2014. GED is general educational development test. <sup>a</sup>Oral contraceptive, hormone patch, vaginal ring, diaphragm or cervical cap, and injectable hormones. <sup>b</sup>Contraceptive implants, intrauterine devices (IUDs) or intrauterine systems, and sterilization. <sup>c</sup>Percentages of the population age twenty-five or older.

long-term method rose over time from 19 percent (5.6 percent of the 30.2 percent choosing protection) to 32 percent (9.8 percent of the 31.0 percent choosing protection) (Exhibit 2). A similar trend toward long-term methods was evident in our control group. However, it was not as strong, rising from 17 percent to 27 percent.

The age distributions of the treatment and control groups were similar, although the control group had a higher fraction of women in their early twenties relative to the treatment group. The control group had a much lower rate of dependent coverage (11.4 percent), compared to the treatment group (40.4 percent). Also compared to the treatment group, the control group resided in neighborhoods with a slightly greater fraction of non-Hispanic white people and a slightly smaller fraction of people with more than a high school diploma.

Because we included only women who were present in our data both before and after the compliance date (or the cut-off date of January 2013 for the control group), normal turnover in the insured population caused the number of observations to diminish as the observation window widened from that compliance date.

**IMPACT ON CONTRACEPTIVE CHOICE** The results of our contraceptive choice model show that women in the treatment group were more likely to choose short-term methods of contraception than women in the control group, before the impact of the change in cost sharing (Exhibit 3). The quadratic trend parameters captured a significant and nonlinear increase in the choice of long-term contraception methods over time, which is consistent with other studies.<sup>17</sup> The women's age, dependent status, and neighborhood characteristics were not significantly associated with long-term methods but were associated with short-term methods. This may be a result of a difference in precision, because of the much higher rate of choosing short-term methods relative to long-term methods (23 percent versus 7 percent of all contraception choice observations) (data not shown).

Our parameters of interest—capturing the treatment effects of being exposed to no cost sharing for prescription contraception on choice of short- and long-term methods of contraception—were both estimated to be positive and highly significant (Exhibit 3). To gain an understanding of the impact of reducing the cost of contraceptive coverage, we computed the marginal effect of reducing cost sharing to zero on the probabilities of choosing each contraceptive option. Our estimates predict that, on average, reducing out-of-pocket spending on contraception to zero increased the overall rate of choosing prescription contraceptives by 2.28 percentage points, relative to a rate of approximately 30 percent before compliance. Two-thirds of the increase (1.43 percentage points) was driven by choice of short-term methods, because of the high rate of choosing such methods before compliance (24.6 percent). The rest of the increase (0.85 percentage point) was driven by choice of long-term methods, which had a precompliance rate of only 5.6 percent.

**ROBUSTNESS TESTING** We conducted several tests to determine the robustness of our results. First, to test our ability to make a causal inference from our results, we restricted our sample. We used propensity scores to make the treatment and control groups more similar,<sup>18</sup> since we found some apparent differences between the groups (Exhibit 2). This sample restriction involved the loss of 36 percent of our observations, which reduced the precision of our estimates.

Using the restricted sample, we estimated the marginal effect of reducing the cost of contraception to zero to be an increase in the overall rate of choosing prescription contraceptives of 1.92 percentage points, which is somewhat close to the 2.28-percentage-point marginal effect we estimated using the unrestricted sample. Similar

**EXHIBIT 3**

**Estimated parameters from a model of prescription contraceptive use**

	Short term	Long term
In treatment group	0.178***	0.065
Quarter <sup>a</sup>	0.019	0.287***
Quarter squared <sup>b</sup>	-0.001**	-0.005***
No cost sharing	0.174**	0.402***
Constant	-1.293***	-11.949***
<b>AGE RANGE (YEARS)</b>		
18-21	Ref	Ref
22-25	0.154	-0.100
26-30	-0.040	0.074
31-35	-0.525***	0.168
36-40	-1.185***	-0.154
41-46	-1.715***	-0.430
<b>RELATION TO EMPLOYEE</b>		
Self	Ref	Ref
Spouse	-0.854***	-0.038
Other	0.168*	-0.129
<b>PERCENT OF NEIGHBORHOOD POPULATION:</b>		
Non-Hispanic white	0.003**	0.000
With less than a high school diploma	-0.019***	-0.003
With a high school diploma or GED	-0.012***	0.003
With income below poverty	0.002	-0.005

**SOURCE** Authors' analysis of claims data for 2008-14 provided by a regional health plan in the upper Midwest. **NOTES** The exhibit shows coefficients from a multinomial probit regression, with "no prescription contraceptive" as the reference outcome. A positive coefficient means that the probability of that outcome (instead of the reference outcome) increases as the value of the predictor increases. There were 151,499 observations and 29,990 unique women. GED is general educational development test. <sup>a</sup>The linear term in quarterly time trend. <sup>b</sup>The quadratic term in quarterly time trend. \*p < 0.10 \*\*p < 0.05 \*\*\*p < 0.01

# The findings from this study indicate that the ACA mandate has had an impact on women's choices about contraception.

to the unrestricted sample, having no cost sharing increased the probability that a long-term method was selected by 0.78 percentage point (0.85 percentage point in our baseline results). Additional details about our propensity score adjustment and detailed outputs from all of the robustness checks are available in the Appendix.<sup>13</sup>

Second, because there were meaningful differences in dependent status between the treatment and control groups, we also ran this regression on a subsample of employees only. The overall increase in choice of prescription contraceptives associated with the change in cost sharing among women who were covered employees was 2.45 percentage points, with an increase in long-term methods of 0.89 percentage point. These findings were very similar to the baseline results.

Third, as mentioned above, we chose to include only women who were present in our data before and after the compliance date (or January 2013 for the control group) to create a panel data set and minimize the chance that the effect of population shifts was confounded with the effect of reduced cost sharing. However, requiring a minimum amount of continuous coverage might have caused our sample to differ from the general population. Thus, we reestimated our model using all women, regardless of how long they were covered by the plan. We found that the change in cost sharing predicted an increase in choice of prescription contraceptives of 2.31 percentage points, of which 0.64 percentage point was an increase in long-term methods. This was consistent with our baseline results.

Fourth, although we studied long-term and permanent contraception methods, we restricted our definition of long-term methods to long-acting reversible contraception methods and removed all women whom we could classify as sterilized. There is much interest by providers<sup>19</sup> and policy makers<sup>20</sup> in these methods. When we

reestimated our model with this slightly smaller sample, the change in cost sharing predicted an increase in choice of prescription contraceptives of 2.18 percentage points, of which 0.72 percentage point was an increase in long-acting reversible contraception methods. Again, these results were consistent with our baseline results.

Finally, it is well known that younger populations tend to be more price sensitive. Thus, we restricted our sample to women ages 18–30 and reestimated our model. We found that the change in cost sharing predicted an increase in the choice of prescription contraceptives of 2.81 percentage points, of which 1.16 percentage points was an increase in long-term methods. As predicted, this evidence suggests that younger women were more sensitive to the elimination of cost sharing, especially when it comes to long-term contraceptive methods.

## Discussion

With the exception of sterilization—where our estimated rate was clearly lower than the national rate, because we observed only sterilizations that occurred during our seven-year observation window or that were indicated by an ICD9 code—the baseline rates of choosing short- and long-term prescription contraceptives in this study (23.1 percent and 5.3 percent, respectively, averaged across treatment and control groups and excluding sterilization) were similar to national rates (20.7 percent and 4.4 percent).<sup>21</sup>

We found that out-of-pocket spending on prescription contraceptives before employer compliance with the ACA contraception mandate was slightly lower in this study relative to recent national estimates. Specifically, in this study we found that the pill cost roughly \$192 per year (about \$15 for each twenty-eight-day supply) and an IUD cost \$235 before compliance, while Nora Becker and Daniel Polsky estimated that the average woman choosing the pill saved \$255 per year after compliance, with the savings on an IUD being \$248.<sup>2</sup> Both studies were based on claims data from one health insurance company, but this study was limited to the Midwest. Our study could reflect lower prices or richer plan designs in that region, compared to the region studied by Becker and Polsky.

We also found that the proportion of oral contraceptives with no cost sharing rose over time from 6 percent of prescriptions to 92 percent of prescriptions (averaged across treatment and control groups), while a national survey<sup>22</sup> found that of 892 privately insured women using prescription contraceptives, the proportion with no cost sharing for oral contraceptives increased from 15 percent in 2012 to 67 percent in 2014.

92%

### No cost sharing

After employer compliance with the ACA mandate, on average across treatment and control groups, 92 percent of prescriptions for oral contraceptives were filled with no cost sharing, compared to 6 percent before compliance.

This difference is consistent with a higher rate of ACA compliance in the upper Midwest than nationally.

To our knowledge, no other study has examined the effect of the ACA mandate on contraception choice. However, the effect size on long-term contraceptive methods that we found was slightly smaller than, but similar to, the sizes found in previous work. Lydia Pace and co-authors<sup>6</sup> found that compared to women covered by a private insurance plan with low cost sharing, IUD initiation was 1.0 percentage point lower for women with moderate cost sharing and 2.3 percentage points lower for women with high cost sharing. Our finding of a 0.85-percentage-point increase in the choice of long-term methods when cost sharing fell to zero might reflect the slightly lower prices in our study region in the period before compliance that we discussed above.

### Policy Implications

The findings from this study indicate that the ACA mandate has had an impact on women's choices about contraception. When high out-of-pocket spending on long-term contraception methods is not a factor, women are more likely to choose these more effective methods, compared to when cost sharing is greater than zero. These findings may have implications for health care spending in the United States. As several studies<sup>23,24</sup> have found, subsidizing contraception is cost-effective from the perspectives of both society and payers by averting unwanted births. Thus, the savings in health care spending from increasing the rate of contraception could be substantial.

The ACA mandate to provide contraceptive care with no patient cost sharing has been a focus of controversy and litigation since the passage of the ACA in 2010. Our results do not estimate the implications of coverage by religious organizations or religiously affiliated nonprofits, as women employed by these organizations may make significantly different contraceptive choices

## Subsidizing contraception is cost-effective from the perspectives of both society and payers by averting unwanted births.

than the general employed population on which we based our study. However, it will be important to monitor future litigation and the policies it may lead to as the ACA contraception mandate continues to alter the way women make choices about their health.

### Conclusion

In the first study of its kind, we used longitudinal data and a control group to look at the effect of reduced cost sharing under the ACA on women's decisions about contraception. We found that when cost sharing for contraceptives fell to zero for women in plans that complied with the ACA's mandate to eliminate that cost sharing, their rate of choosing prescription contraceptives rose much more than the rate for women in plans unaffected by the mandate. Moreover, compliance with the mandate significantly increased the probability that a woman would choose a long-term contraceptive method above and beyond the general trend of increasing choice of these methods. These findings suggest that women are price sensitive with regard to contraception choice, and further research is warranted to discover whether the ACA mandate will reduce the rate of unintended pregnancy. ■

Preliminary versions of the results of this research were presented in poster form at the AcademyHealth Annual Research Meeting, Minneapolis, Minnesota, June 14–16, 2015, and at the Health Care System Research

Network meeting, Atlanta, Georgia, April 14, 2016. Presentations of the results were made at the Southeastern Health Economics Study Group Conference, Atlanta, Georgia, November 6–7, 2015, and the Minnesota

Health Services Research meeting, St. Paul, Minnesota, March 1, 2016. The authors appreciate the constructive feedback they received from attendees at these meetings.

## NOTES

- 1 IMS Institute for Healthcare Informatics. Medicines use and spending shifts: a review of the use of medicines in the U.S. in 2013. Parsippany (NJ): The Institute; 2014.
- 2 Becker NV, Polsky D. Women saw large decrease in out-of-pocket spending for contraceptives after ACA mandate removed cost sharing. *Health Aff (Millwood)*. 2015;34(7):1204–11.
- 3 Dieguez G, Pyenson BS, Law AW, Lynen R, Trussell J. The cost of unintended pregnancies for employer-sponsored health insurance plans. *Am Health Drug Benefits*. 2015;8(2):83–92.
- 4 Birgisson NE, Zhao Q, Secura GM, Madden T, Peipert JF. Preventing unintended pregnancy: the Contraceptive CHOICE Project in review. *J Womens Health (Larchmt)*. 2015;24(5):349–53.
- 5 Foster DG, Rostovtseva DP, Brindis CD, Biggs MA, Hulett D, Darney PD. Cost savings from the provision of specific methods of contraception in a publicly funded program. *Am J Public Health*. 2009;99(3):446–51.
- 6 Pace LE, Dusetzina SB, Fendrick AM, Keating NL, Dalton VK. The impact of out-of-pocket costs on the use of intrauterine contraception among women with employer-sponsored insurance. *Med Care*. 2013;51(11):959–63.
- 7 Garipey AM, Simon EJ, Patel DA, Creinin MD, Schwarz EB. The impact of out-of-pocket expense on IUD utilization among women with private insurance. *Contraception*. 2011;84(6):e39–42.
- 8 Hatcher RA, Trussell J, Nelson AL, Cates W Jr, Kowal D, Policar MS. *Contraceptive technology*. 20th rev. ed. New York (NY): Ardent Media; 2011.
- 9 Branum AM, Jones J. Trends in long-acting reversible contraception use among U.S. women aged 15–44 [Internet]. Hyattsville (MD): National Center for Health Statistics; 2015 Feb [cited 2016 Jul 1]. (NCHS Data Brief No. 188). Available from: <https://www.cdc.gov/nchs/data/databriefs/db188.pdf>
- 10 We view the method of contraception to be the choice of the woman. However, physicians have influence over women's choices and may be more likely to steer women toward long-term methods when patients' cost sharing is eliminated because of the greater effectiveness of long-term methods and because physicians receive reimbursement for the procedures involved in long-term methods.
- 11 Pace L, Dusetzina S, Keating N. Early impact of the Affordable Care Act on oral contraceptive cost sharing, discontinuation, and nonadherence. *Health Aff (Millwood)*. 2016;35(9):1616–24.
- 12 Kavanaugh ML, Jerman J, Ethier K, Moskosky S. Meeting the contraceptive needs of teens and young adults: youth-friendly and long-acting reversible contraceptive services in U.S. family planning facilities. *J Adolesc Health*. 2013;52(3):284–92.
- 13 To access the Appendix, click on the Appendix link in the box to the right of the article online.
- 14 Insurance policies created or sold before March 23, 2010, that had no significant plan changes are grandfathered at the pre-ACA contraceptive cost-sharing amount until such changes are made. Certain employers may also have a religious exemption from compliance with ACA-mandated coverage levels for contraceptive care. Our control group consisted primarily of employers with grandfathered plans. We suspect that only one of the thirteen employers was exempt for religious reasons.
- 15 We did not capture multiple changes in contraception status in a year. For example, if a woman had no prescription contraceptive method at the end of plan year 2012, started using short-term contraceptives at the beginning of the next year, and switched to a long-term method right before the end of plan year 2013, only the change from no contraception to long-term contraception would be captured in this analysis.
- 16 We interpreted the coefficients on these neighborhood variables as neighborhood effects, not as proxies for individual characteristics. See Geronimus A, Bound J, Neidert LJ. On the validity of using census geographic characteristics to proxy individual socioeconomic characteristics. *J Am Stat Assoc*. 1996;91(434):529–37.
- 17 Finer LB, Jerman J, Kavanaugh ML. Changes in use of long-acting contraceptive methods in the United States, 2007–2009. *Fertil Steril*. 2012;98(4):893–7.
- 18 Dowd B, Karmarker M, Swenson T, Parashuram S, Kane R, Coulam R, et al. Emergency department utilization as a measure of physician performance. *Am J Med Qual*. 2014;29(2):135–43.
- 19 Committee on Gynecologic Practice Long-Acting Reversible Contraception Working Group. Committee opinion no. 642: increasing access to contraceptive implants and intrauterine devices to reduce unintended pregnancy. *Obstet Gynecol*. 2015;126(4):e44–8.
- 20 Association of State and Territorial Health Officials. Long acting reversible contraception (LARC) learning community launch report [Internet]. Arlington (VA): ASTHO; 2014 Aug 19 [cited 2016 Jul 5]. Available from: <http://www.astho.org/Programs/Prevention/Maternal-and-Child-Health/LARC-Learning-Community-Launch-Report/>
- 21 Jones J, Mosher W, Daniels K. Current contraceptive use in the United States, 2006–2010, and changes in patterns of use since 1995 [Internet]. Hyattsville (MD): National Center for Health Statistics; 2012 Oct 18 [cited 2016 Jul 5]. (National Health Statistics Report No. 60). Available from: <http://www.cdc.gov/nchs/data/nhsr/nhsr060.pdf>
- 22 Sonfield A, Tapales A, Jones RK, Finer LB. Impact of the federal contraceptive coverage guarantee on out-of-pocket payments for contraceptives: 2014 update. *Contraception*. 2015;91(1):44–8.
- 23 Peipert JF, Madden T, Allsworth JE, Secura GM. Preventing unintended pregnancies by providing no-cost contraception. *Obstet Gynecol*. 2012;120(6):1291–7.
- 24 Kearney MS, Levine PB. Subsidized contraception, fertility, and sexual behavior. *Rev Econ Stat*. 2009;91(1):137.