Health Insurance Coverage and Women's Use of Effective Contraceptives in the United States, 1995-2010

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Abstract
The introduction of contraceptive mandates from the 1990s onwards has implied significant changes in what it means to be an insured woman from a contraceptive coverage standpoint. We used data from the 1995 and 2006–2010 cycles of the National Survey of Family Growth NSFG) to explore whether the association between being insured and women's use of the most effective reversible contraceptives has changed over time. Using logistic regressions, we assessed this association in both 1995 and 2006-2010, and then combined data from the 1995 and 2006–2010 cycles. We conducted similar analyses on different sub-groups of women. Our results indicate a positive association between both public and private insurance and the use of highly effective methods. We also find a significant increase in the magnitude of the association between private insurance and highly effective methods use over time (OR, 1.56). This increase was only experienced by women under age 35 and already contracepting women.

Introduction

It is estimated that in the United States, 49% of pregnancies are unintended. Of these unintended pregnancies, 43% occur due to imperfect contraception use (Trussell & Wynn, 2008). This implies that a significant proportion of unintended pregnancies are due to women choosing less effective contraceptive methods (Speidel, Harper & Shields, 2009). Due to the higher cost and requirements for a prescription, health insurance can play a pivotal role in women's access to the most effective contraceptive methods; however, it is estimated that 21% of reproductive aged women were uninsured in 2012 (Alan Guttmacher Institute, 2013). This is especially noteworthy in light of previous literature consistently finding that prescription contraception users are significantly more likely to have health insurance (Sonfield et al., 2004; Culwell & Feinglass, 2007a; Culwell & Feinglass, 2007b; Stolk et al., 2008; Nearns, 2008; Upson et al., 2010).

While existing literature supports a significant association between health insurance and the use of prescription contraceptives, most literature has ignored whether or not this association has changed *over time*. However, since the 1990s, there have been substantial changes in what it means to be an insured woman from a contraceptive coverage standpoint. In 1993, only 23% of private insurers covered the top five reversible methods, compared with 89% in 2002 (Sonfield et al., 2004). The introduction of contraceptive mandates across a number of states has implied that coverage of reversible contraception and the choice of covered methods has increased substantially since the early 1990s (Sonfield et al., 2004). Women in states with contraceptive mandates have also been found to more consistently use contraception compared to women in states without these mandates (Magnusson et al., 2012).

Only one study has looked at the change in the association between prescription contraception use and insurance coverage over time. Culwell and Feinglass (2007b) found that privately insured women became more likely to use prescription contraceptives between 1995 and 2002. However, little is understood about which sub-groups of women are driving this trend. Increased access to contraception through changes to insurance coverage can have different effects for different groups of women. Younger women, for instance, may have especially high opportunity costs of unintended or mistimed pregnancies (Bailey, 2006; Miller, 2011). At the same time, there are much higher rates of uninsurance amongst younger women aged 18 to 24 (Nearns, 2009; Moonesinghe et al., 2013). In line with this, Nearns (2009) finds a significantly larger effect of private and public insurance on prescription contraceptive use for younger women than previous studies looking at a wider age range of women (Culwell & Feinglass, 2007a; Culwell & Feinglass, 2007b), though no studies have directly tested whether these differences are significant.

Given the changing nature of insurance coverage for reproductive aged women, we explore whether the association between health insurance and effective contraception use has changed across the United States between 1995 and 2010. We add to the existing literature by investigating changes in the effect of health insurance for different sub-groups over time. We focus on whether there are significant differences among younger versus older women and amongst already contracepting versus non-contracepting women.

Methods

Data

We used data from the 1995 and 2006–2010 cycles of the National Survey of Family Growth (NSFG), a nationally representative survey conducted by the National Center for Health Statistics. The data were collected during personal interviews in the homes of women aged 15–44 who were members of the civilian, non-institutionalized population of the United States. In the 1995 and 2006–2010 cycles, respectively, a total of 10,847 and 12,279 women were interviewed. Our analyses focused on the use of reversible contraceptives among women who were at risk for an unintended pregnancy. Women were categorized as at risk for an unintended pregnancy if they are not pregnant, did not wish to become pregnant, were not postpartum, had heterosexual intercourse in the past three months, and if they or their partners were non-surgically or surgically sterile. We excluded women who used non-reversible methods because the changes in insurance coverage over the time period in question applied to reversible contraceptive methods. After we excluded such women, as well as those who did not provide full information for our variables of interest, the analytic sample consisted of 4,727 women in the 1995 cycle and 5,775 women in the 2006–2010 cycle.

Measures

Dependent variable. We constructed a binary variable that classified women according to whether they were using one of the most effective reversible methods (the pill, injectable, IUD,* implant, patch or ring) or not. We also sub-categorized women who did not use highly effective methods into two further categories: women who used less effective reversible method (diaphragm, male or female condom, foam, cervical cap, sponge, suppository, jelly, cream, natural family planning, calendar rhythm, withdrawal, emergency contraception or another method) and women who used no method. If women had used multiple methods, we categorized them according to the method with the highest effectiveness rate in typical use.

The rationale for these categories follows from the methods' typical-use effectiveness rates. The most effective contraceptives are 92–99.9% effective in typical use. These methods require a prescription and, compared with other contraceptives, tend to require greater expenditures of money and time because of the need for physician services. The remaining methods are 73–85% effective in typical use, and tend to be much less expensive and more easily available than prescription methods. Finally, using no method typically results in pregnancy for 85% of women within one year (Trussell & Wynn, 2008).

Independent variables. The main independent variable of interest in this analysis was insurance coverage and the type of insurance. We categorized women according to whether they had private insurance, public insurance (i.e. Medicaid, military, or other public assistance program that pays for medical care), or no insurance. The NSFG also gathers information on other important correlates of contraceptive-related decisions, such as socioeconomic, demographic, religious and family characteristics. Therefore, we controlled for women's age, race, education, labor force status, household income, union status, number of children ever born, religious affiliation (Catholic, Protestant, none or other) and frequency of attendance at religious services. Other characteristics for which we controlled included the woman's number of sexual partners in the previous 12 months, which could influence attitudes toward contraception, and whether

women lived in a metropolitan area, which may affect access to family planning centers.

Analysis

First we computed the weighted proportions of women in each contraceptive effectiveness category, by type of insurance coverage (private, public, or none) and year. We used Pearson chi-square statistics to assess the extent to which contraceptive choices changed over time among women in each insurance group.

We then conducted a multivariate analysis, running multiple logistic regression models that determined privately insured and publicly insured women's risks of using the most effective reversible methods relative to other methods and non-users, as compared to that of non-insured women. Separate models (Models 1a and 1b) were calculated for the 1995 and 2006-2010 NSFG cycles respectively. Finally, we constructed a model aimed at determining whether changes occurred over time in the association between insurance coverage and contraceptive effectiveness. In this model (Model 2), we combined data from the 1995 and 2006–2010 cycles and included terms for interactions between cycle (i.e. a dummy for the 2006-2010 cycle) and our insurance subcategories.

Results of all models are expressed as odds ratios. As the NSFG oversampled certain subpopulations, we used sampling weights in all multivariate analyses. Estimation techniques that accounted for stratification, clustering and weighting were integrated in the standard error calculations. All analyses were performed using commands in STATA/SE version 12.

Supplementary Analyses

One of the main goals of this paper was to assess which factors may be driving any increase in insured women's use of highly effective contraceptive methods. In particular, we focused on age, categorizing women into three groups: those aged 15 to 24, those aged 25 to 34, and those aged 35 to 44. These age categories were selected due to the significant differences in the likelihood of these women having health insurance (Moonesinghe et al., 2013; Nearns, 2009), as well as the differences in these women's opportunity costs of an unintended pregnancy (Miller, 2011). To determine whether there were different associations depending on a woman's age, we conducted separate multivariate analyses on women aged 15 to 24, 25 to 34, and 34 to 44.

To assess whether any changes over time were driven by women who were already contracepting (i.e. using less effective methods) or those who were not contracepting, we conducted analyses comparing effective methods users with less effective users and non-users separately. We also varied our definition of "effective" methods to include women who underwent surgical sterilization. This was due to the higher rates of surgical sterilization amongst older women (Upson et al., 2010).

Results

Descriptive Overview

In Table 1, we present weighted means and proportions for all the characteristics of our samples in 1995 and 2006-2010. We also conducted chi-squared tests and t-tests to determine whether

there significant differences in these attributes across the two cycles. We found that overall, there were significant changes in all three of our contraception categories. Use of effective methods increased across the two cycles from 46% in 1995 to 52% in 2006-2010. The use of less effective methods decreased from 42% to 31%, while the proportion of women using no methods increased from 12% to 17%. We also found significant differences in insurance state, with the proportion of women with private insurance decreasing from 73% to 68% and the proportion of women with public insurance increasing from 15% to 18%. There were no significant changes in the proportion of uninsured women.

There were some other noteworthy changes in our sample of women over the time period. The proportion of Hispanic women and women in the Other race category increased, while the proportion of white women decreased. We also note increases in the proportion of women with at least some college education and a college degree, and a slight decrease in the proportion of women with less than high school education. There was an 8 percentage point decrease in he proportion of women who indicated that they were labor force non-participants and a significant increase in the proportion of women falling into the highest household income category. The proportion of women who identified with any religious group increased by 7 percentage points, with significant decreases in women self-identifying as Protestant and Catholic, and increases in women in the Other category.

Table 1 about here.

In Table 2, we present the percentage distribution of women using each category of contraceptive by insurance type. We see that the increase in the proportion of women using the most effective contraceptive methods appears to be driven by women with private insurance. Women with either private or public insurance appear to be less likely to use other methods over time, but became more likely to use no method of contraception between 1995 and 2006-2010. Women with public insurance became particularly more likely to resort to no method at all across the cycles.

Table 2 about here.

Multivariate Results

To determine whether these trends hold once we control for a number of demographic, socioeconomic, family and behavioral factors, we turn to our multivariate analyses presented in Table 3. Here, we see that, net of all other factors, having private and public insurance are significantly associated with the use of highly effective contraceptive methods in both 1995 and 2006-2010. In 1995 (Model 1a), it appears that women with public insurance had a higher likelihood of using highly effective methods (odds ratio, 1.24) compared to those with public insurance (odds ratio, 1.59). This trend continued into 2006-2010 (Model 1b), though there are increases in the likelihood of both privately and publicly insured women using highly effective contraceptives. When we turn to Model 2, however, we see that only the interaction term between private insurance and time is statistically significant. Women with private insurance became more likely to use highly effective contraceptives relative to other women.

Table 3 about here.

Supplementary Analyses

Our analyses looking at different sub-groups of women (not shown) uncovered some interesting differences between the different age categories. Women in the youngest age group (i.e. 15 to 24) were significantly more likely to use effective methods in both years and in the combined regression (odds ratios, 1.57 and 2.25 for private and public insurance respectively). Similar to the model with all age-groups, there was a significant private insurance and year interaction (odds ratio, 1.71). Amongst those aged 25 to 34, we saw a smaller association between insurance and effective contraception use, though private insurance also became more important over time as the year and private insurance interaction was statistically significant (odds ratio, 1.63). With the oldest age group, however, only public health insurance was statistically significant, and even then only in1995 (odds ratio, 2.29). The coefficients for both health insurance measures were not significant in the combined model, nor were the year and health insurance interactions.

Supplementary analyses that compared highly effective contraceptive users to either less effective method users or no method users separately (not shown) yielded very consistent findings across all age groups. For all age groups, there was only a significant interaction of year and private insurance in regressions that included already contracepting women (i.e. highly effective versus less effective). There was no significant time interaction in the models that compared highly effective users with non-users.

We found that the association between insurance and contraceptive effectiveness was robust to the addition of a number of controls in both 1995 and 2006-2010. Though not shown, we note that the addition of state group fixed effects did not alter the association. Even after controlling for state-specific factors, a persistent association remained between insurance and the use of highly effective methods. Finally, when we included women who opted for surgical sterilization in our analysis, we observed a similar pattern over time as when we excluded this group altogether from our definition of women at risk of an unintended pregnancy.

Discussion

On the surface, our base case analysis seems to confirm what we know from previous research by Culwell and Feinglass (2007b). Women, especially those who are privately insured, have increased their use of highly effective contraceptives since the 1990s. However, the results of our analyses taking different sub-groups into account paint a more nuanced picture. Our multivariate regression results indicate that over time private insurance became more strongly associated with the use of highly effective contraceptive methods only amongst already contracepting women. It is possible, then, that women who previously used less effective methods were able to switch to more effective methods in light of more comprehensive insurance coverage. This was not the case for women who did use any form of contraception.

Our supplementary analysis further highlights the importance of both public and private health insurance for *younger* women. The positive association between insurance and the use of more

effective contraceptive methods was almost completely driven by women under the age of 35. These results suggest that increased access to comprehensive health insurance should be considered a strategy to address unintended pregnancies, particularly among young women. These findings are in line with the idea that young women have benefited from increased coverage of contraceptives by private insurers since the 1990s.

Interestingly, however, our results indicate that this has not been the case for women over the age of 35. Increased access to more effective contraceptives may not be a key driver of effective contraceptive use for this age group. It could be that these women have higher rates of pregnancy ambivalence. Previous research has also suggested that women in this age group are more likely to be contraceptive non-users, possibly due to perceived lower risks of pregnancy (Upson et al., 2010; Wu et al., 2008). However, women over 35 have the greatest proportion of unintended pregnancies ending in abortion relative to women in other age groups. Amongst women aged 35 to 39 and 40 and over, 60% and 56% of unintended pregnancies respectively end in abortion (Upson et al., 2010).

There are some limitations that should be taken into consideration when interpreting our results. First, we note that we cannot infer causality due to the possibly endogenous relationship between insurance and effective contraception use. There is the potential for reverse causality if women purchase insurance in order to use more effective contraception methods. As such, we can only make conclusions about the associations between insurance and effective contraception use.

With respect to data, we note that the NSFG data is not a panel dataset where individual respondents are followed over time. This analysis, therefore, is not longitudinal. However, the use of repeated cross-sections allows for a trend analysis that can compares contraceptive use patterns between two time periods. Finally, as with all survey data, we note the potential for recall bias or for women answering questions on topics relating to sexual behavior to be biased towards social desirability.

Conclusion

Overall, our results highlight the importance of health insurance to women's use of effective contraceptives. Over time, increased access through private insurance reforms encouraging wider contraceptive coverage may have helped younger women using less effective methods to transition to more effective methods. It appears, however, that access is not necessarily the driver of lower rates of effective contraceptives for all women. There may be other factors driving lower rates of effective contraceptive use for women over age 35 and for contraceptive non-users that should be explored in future research.

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Tables

Table 1 Descriptive overview of women aged 15–44 at risk for unintended pregnancy, 1995 and 2006

	1995		2006-2012		
	Mean	Std. Err.	Mean	Std. Err.	Sig.
Contraceptive method					
Most effective	46%	0.01	52%	0.01	***
Less effective	42%	0.01	31%	0.01	***
No method	12%	0.01	17%	0.01	***
Insurance status					
Private insurance	73%	0.01	68%	0.01	**
Public insurance	15%	0.01	18%	0.01	**
No insurance	13%	0.01	14%	0.01	
Race/ethnicity					
Hispanic	10%	0.01	16%	0.01	***
White	73%	0.01	63%	0.02	***
Non-Hispanic Black	13%	0.01	14%	0.01	
Other	4%	0.00	7%	0.01	**
Age					
14-17	5%	0.00	4%	0.00	
18-24	29%	0.01	31%	0.01	
25-34	41%	0.01	38%	0.01	**
35-44	24%	0.01	27%	0.01	
Education					
Less than high school	15%	0.01	17%	0.01	**
High school	33%	0.01	23%	0.01	***
Some college	21%	0.01	23%	0.01	†
College	31%	0.01	38%	0.01	***
Labor force status					
Full-time	44%	0.01	47%	0.01	†
Part-time	21%	0.01	26%	0.01	***
Non-participant	35%	0.01	27%	0.01	***
Household income					
<$20,000	23%	0.01	22%	0.01	
$20,000-$39,999	30%	0.01	27%	0.01	**
$40,000-$69,999	29%	0.01	29%	0.01	
>=$70,000	18%	0.01	22%	0.01	***
Partner	58%	0.01	58%	0.01	
# Children eve born	0.96	0.02	0.99	0.03	***
Religious service attendance					
Weekly	28%	0.01	25%	0.01	†

Less than weekly	47%	0.01	50%	0.01	*
Never	25%	0.01	25%	0.01	
Religious affiliation					
None	13%	0.01	20%	0.01	***
Protestant	49%	0.01	44%	0.01	**
Catholic	31%	0.01	26%	0.01	***
Other	6%	0.00	10%	0.01	**
# Sexual partners in last year	1.22	0.01	1.23	0.01	***
Metropolitan residence					
Non-metropolitan	32%	0.01	34%	0.02	
Central city	50%	0.01	48%	0.02	
Other metropolitan	19%	0.01	18%	0.02	
N	4727		5775		

***p<.001. **p<0.01.*p<0.05. †p<.10

Table 2. Percentage distribution of women aged 15–44 at risk for unintended pregnancy, by type of contraceptive method used, according to insurance type.

	1995				2006–2010			
	All	**Private**	**Public**	**None**	**All**	**Private**	**Public**	**None**
Most effective	46.1	45.6	52.1	41.9	53.0***	56.0***	51.9	40.4
Less effective	42.2	44	34	42.1	30.6***	29.3***	27.5*	41.1
None	11.7	10.4	13.9	16	16.3***	14.7***	20.6***	18.5
Total	100	100	100	100	100	100	100	100

***p<.001. **p<0.01.*p<0.05. †p<.10

Table 3. Adjusted odds ratios from logistic regression analyses assessing the likelihood that women across two NSFG cycles used a most effective contraceptive method, rather than less effective or no method

	Model 1a			Model 1b			Model 2		
	1995			2006-2010			1995 and 2006-2010		
	Odds Ratio	Std. Err.	Sig	Odds Ratio	Std. Err.	Sig	Odds Ratio	Std. Err.	Sig
Year 2006-2010							0.97	0.13	
Insurance									
Private	1.24	0.13	*	1.58	0.18	***	1.11	0.11	
Public	1.59	0.19	***	1.75	0.24	***	1.65	0.19	***
None (Ref)									
Insurance*Year 2006-2010							1.56	0.22	**
Private*2006-2010							0.99	0.17	
Public*2006-2010									
None (Ref)									
Race/ethnicity									
White (Ref)									
Hispanic	0.97	0.12		0.91	0.11		0.94	0.08	
Non-Hispanic Black	0.91	0.10		0.64	0.07	***	0.76	0.06	***
Other	0.54	0.11	**	0.40	0.07	***	0.46	0.06	***
Age									
15-17 (Ref)									
18-24	1.24	0.22		1.24	0.29		1.21	0.17	
25-34	0.92	0.18		1.01	0.25		0.94	0.14	
35-44	0.32	0.06	***	0.58	0.16	*	0.43	0.07	***
Education									
Less than high school (Ref)									
High school	1.17	0.15		1.12	0.14		1.15	0.10	
Some college	1.23	0.17		1.41	0.20	*	1.33	0.13	**
College	1.37	0.20	*	1.45	0.23	*	1.42	0.16	**

Labor force status									
Non-participant (Ref)									
Full-time	1.44	0.11	***	1.30	0.13	*	1.38	0.09	***
Part-time	1.21	0.11	*	1.21	0.15		1.22	0.09	**
Household income									
<$20,000	1.09	0.11		1.20	0.15		1.14	0.09	†
$20,000-$39,999 (Ref)									
$40,000-$69,999	0.86	0.07	†	1.22	0.15	†	1.02	0.07	
≥$70,000	0.77	0.07	**	1.15	0.15		0.95	0.07	
Partner	1.10	0.10		0.84	0.08	†	0.97	0.06	
Children ever born									
0									
1	1.09	0.10		0.86	0.09		0.99	0.07	
2	0.95	0.10		1.18	0.16		1.07	0.09	
≥3	0.91	0.11		0.94	0.13		0.95	0.09	
Religiosity									
At least weekly (Ref)									
Less than weekly	1.28	0.11	**	1.14	0.13		1.21	0.09	**
Never	1.22	0.12	*	1.04	0.14		1.13	0.09	
Reglious affiliation									
None (Ref)									
Protestant	1.10	0.12		1.03	0.12		1.07	0.08	
Catholic	0.92	0.10		0.93	0.12		0.92	0.08	
Other	0.72	0.12	†	0.90	0.15		0.84	0.10	
Number of partners	0.79	0.04	***	0.65	0.04	***	0.72	0.03	***
Metropolitan residence									
Non-metropolitan									
Central city	0.77	0.07	**	0.66	0.07	***	0.71	0.05	***
Other metropolitan	0.74	0.06	***	0.68	0.07	***	0.71	0.05	***
N	4,727			5,775			10,502		

***p<.001. **p<0.01.*p<0.05. †p<.10