



The effects of the dependent coverage provision on young women's utilization of sexual and reproductive health services



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ABSTRACT

The Affordable Care Act dependent coverage provision expanded insurance for young adults by allowing maintained coverage through a parent's plan until the age of 26. This study examines whether this provision was associated with changes in sexual and reproductive health service utilization among young adult women, and if effects differed by race/ethnicity. The National Survey of Family Growth data were used to examine utilization among women before (2006–2009) and after (2011–2013) enactment of the provision. A difference-in-differences model was used to evaluate the effects on four measures of sexual and reproductive health services and one measure of health insurance coverage, treating women 19–25 years old as the exposure group and women 27–34 years old as the control group. This study finds that the dependent coverage provision was associated with a significant decrease in the probability of lacking health insurance, but finds no effects on sexual and reproductive health service utilization overall. In stratified models, increases in receipt of birth control prescriptions and methods as well as birth control check-ups or tests were present only for Hispanic women. There were no significant effects on birth control counseling or information or STD service utilization for any groups. Lacking health insurance coverage decreased only among non-Hispanic White women and Hispanic women, but was not significant for non-Hispanic Black women. These results suggest that women's utilization of sexual and reproductive health services overall may not increase with parental insurance gains, but Hispanic women do increase utilization of some birth control services with this improved coverage.

1. Introduction

The dependent coverage provision of the Affordable Care Act (ACA) expanded insurance access for young adults by allowing them to maintain health insurance coverage through a parent's plan until the age of 26. Research has shown that this provision was associated with increased utilization of preventive care, mental health treatment, dental care, and prenatal care among young adults (Han et al., 2014; McClellan, 2017; Vujicic et al., 2014; Daw and Sommers, 2018). In addition, some studies have suggested that the dependent coverage provision decreased young women's childbearing, increased use of long-term hormonal contraceptives, and decreased the likelihood of abortion, but had no change in contraceptive use overall (Heim et al., 2018; Abramowitz, 2018). Previous studies have examined the impact of the dependent coverage provision on pap test utilization, finding no change, as well as the impact on sexually transmitted disease (STD) rates, finding increases in Gonorrhea and Chlamydia among young women associated with the policy (Han et al., 2014; Oney, 2018). These studies suggest that the dependent coverage provision may be having an impact on some aspects of young women's sexual and reproductive

health behaviors and service utilization.

No studies so far have examined the impact of the dependent coverage provision on STD testing, and have only used outcomes for birth control access that focus on contraceptive use, rather than broader measures that include appointments for birth control counseling or information, medical tests or check-ups, or birth control prescriptions. Increasing sexual and reproductive healthcare access for young adults is particularly important due to the stigmatized nature of these services, which can result in lower levels of utilization despite higher levels of sexually transmitted infections among this age group (Cook and Dickens, 2014; Cunningham et al., 2009; Centers for Disease Control and Prevention, 2009). Specific components of the ACA explicitly targeted the need to increase preventive reproductive health services access for women, including a mandate that contraceptives be covered by insurance plans starting in August 2012, as well as a requirement that plans offer no-cost preventive reproductive services for women.

This study aims to add to the knowledge base on the effects of the dependent coverage expansion by examining whether this provision was associated with a change in the utilization of additional measures of sexual and reproductive health services among young adult women.

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In addition, this paper examines if effects of the provision on sexual and reproductive health services utilization varied by race/ethnicity. This paper contributes to the literature on the effects of the ACA on sexual and reproductive health services utilization, the effects of the dependent coverage provisions on young adults, and differential effects of the policy by race/ethnicity.

2. Methods

2.1. Sample

This study uses the National Survey of Family Growth (NSFG), a nationally representative multi-state probability-based survey conducted by the Centers for Disease Control and Prevention's (CDC) National Center for Health Statistics. The female respondent files for 2006–2010 and 2011–2013 were used, which include data on women's reproductive health for non-institutionalized women of reproductive age. The NSFG is conducted through voluntary in-person surveys, and include questions regarding insurance coverage, reproductive service utilization, fertility, pregnancy, family characteristics, and individual characteristics. The data used in this study have been used in past analyses to examine the effects of coverage expansions on women's utilization of various preventive sexual and reproductive health services (Abramowitz, 2018; Arora and Desai, 2016). Following other studies on the dependent coverage provision, the analyses were limited to women 19–34 years old, treating women 19–25 years old who are eligible for dependent coverage as the exposure group and women 27–34 years old who are ineligible for the provision as the control group, before (2006–2009) and after (2011–2013) enactment of the provision (Vujcic et al., 2014; Sommers and Kronick, 2012). Women aged 26 years old were excluded from analyses as this age may be a transition period due to young adults losing dependent coverage eligibility at this time. Following other studies of the provision, 2010 was excluded from the analyses as a transition year (Han et al., 2014; Daw and Sommers, 2018; Heim et al., 2018; Abramowitz, 2018). The definition of the post-policy period was limited to 2011–2013 because the ACA marketplace and many state Medicaid expansions were enacted in 2014, creating coverage options that could affect insurance availability through alternative routes. Currently pregnant women ($n = 754$), women on maternity leave ($n = 124$), and women trying to become pregnant ($n = 594$) were excluded because pregnancy status and intention affects recent service utilization. Observations with any missing variables were dropped, leaving only respondents with complete cases. The total unweighted number of women included in the female respondent files that met these criteria was 7649, observing 4990 women before policy implementation and 2659 after policy implementation.

2.2. Measures

To assess changes in service utilization resulting from the dependent coverage provision, four measures that capture sexual and reproductive healthcare utilization in the last 12 months were selected: receiving a method or a prescription for birth control; receiving counseling or information about birth control; receiving a check-up or medical test related to birth control; and receiving testing for a sexually transmitted disease. In addition, a measure for lacking health insurance or coverage at any time in the last 12 months was used to determine if the provision resulted in health insurance gains. During this period, the American College of Obstetricians and Gynecologists recommended a preventive visit for all women that should include annual counseling of contraceptive options for women 19 years or older (American College of Obstetricians and Gynecologists, 2011). The Centers for Disease Control and Prevention guidelines recommended annual screening for some STDs for all sexually active women (Centers for Disease Control and Prevention, 2006). For individuals on contraceptives, the World Health Organization recommended an annual follow-up for combined oral

contraceptives (World Health Organization, 2004). Updates in these clinical guidelines did not change over this period for the frequency of these recommended services. Because individuals with long-acting reversible contraception may not require as much additional utilization for their contraceptive method, women using the contraceptive implant, injections, or with an intrauterine device were omitted from the three birth control outcomes ($n = 1129$).

Individual and household characteristics were used as covariates in the models. These individual characteristics included age, marital status, race/ethnicity, labor force participation, and educational achievement. Household characteristics included household income and residence inside of a Metropolitan Statistical Area. Age was reported as age in years, 19 to 34. Marital status was re-categorized as married, never married, and widowed/divorced/separated. Race/ethnicity was combined to non-Hispanic White, non-Hispanic Black, non-Hispanic other, or Hispanic. Labor force participation was categorized as currently working, currently in school or not currently working. Educational achievement was re-coded as less than high school education, high school graduate, some college, or college graduate. Household income was re-categorized to three categories for approximately equal distributions within the categories: \$19,999 or less, \$20,000–\$39,999, or \$40,000 or more/year. Metropolitan area was re-categorized to place of residence inside a Metropolitan Statistical Area (MSA) or outside.

2.3. Statistical analyses

Descriptive analyses for individual and household characteristics are presented in Table 1 as well as any differential change in these characteristics over time between the two age groups. Due to the high number of outcomes presented in this paper, the Benjamini-Hochberg procedure was used to adjust for multiple hypothesis testing for all main table outcomes including the regressions and descriptive statistics.

To examine the association between sexual and reproductive health service utilization and the dependent coverage provision, difference-in-differences models were used to estimate the effects of the policy on each outcome for young women 19–25 relative to women 27–34 (Table 2). For these models, an interaction variable between exposure group (women 19–25) versus control group (women 27–34) and an indicator variable for pre-policy (2006–2009) or post-policy (2011–2013) was constructed.

The model is specified below:

$$y_{it} = \beta_0 + \beta_1(\text{TreatmentGroup})_i + \beta_2(\text{Post})_{it} + \beta_3(\text{TreatmentGroup} * \text{Post})_{it} + \gamma'x_{it} + \kappa_t + \varepsilon_{it}.$$

$\gamma'x_{it}$ is a vector of control variables, including age, marital status, race/ethnicity, income, labor force participation, education, and metropolitan residence. κ_t represents year fixed-effects. y_{it} represents the dependent variable. The interaction term is the difference-in-differences (the β_3 coefficient), which estimates how much utilization changed among women 19–25 after policy implementation relative to utilization among women 27–34 who were ineligible for coverage expansion.

To assess the appropriateness of the difference-in-differences approach, the assumption of parallel trends was tested between the exposure and control group for the outcomes prior to policy implementation (Appendix Table A1). There were no significant differences in pre-trends between the groups, suggesting that the parallel trends assumption was met for the research design. To confirm that the results were robust to alternative models, the difference-in-differences analyses were repeated using probit and logistic regression models for binary outcomes (Appendix Table A2).

As racial and ethnic disparities exist in utilization of sexual and reproductive health services and with the mixed evidence regarding

Table 1
Characteristics before and after dependent coverage provision.

	Women Aged 19–25		Women Aged 27–34		Differential change	p-Value
	Pre-policy 2006–2009	Post-policy 2011–2013	Pre-policy 2006–2009	Post-policy 2011–2013		
Demographic characteristics	N = 2372	N = 1243	N = 2618	N = 1416		
Age (mean)	21.91	21.87	30.42	30.40	–0.02	0.878
Marital status						
Never married	80.32	85.87	34.24	38.28	1.51	0.664
Married	15.94	12.07	51.90	46.39	1.64	0.637
Divorced/separated/ widowed	3.74	2.06	13.85	15.32	–3.16	0.105
Race/ethnicity						
Black	13.06	16.46	14.06	14.18	3.28	0.137
White	64.15	57.62	62.04	59.16	–3.65	0.331
Hispanic	16.54	19.94	18.18	20.43	1.15	0.656
Other	6.25	5.97	5.72	6.23	–0.78	0.715
Employment						
Working	69.78	68.42	73.25	69.36	2.53	0.468
Not working	19.17	20.94	23.29	26.44	–1.37	0.658
In school	11.05	10.64	3.46	4.21	–1.16	0.516
Education						
Less than high school	12.54	9.58	15.68	16.67	–3.96	0.080
High school graduate	25.91	28.85	24.42	22.15	5.20	0.136
Some college	40.46	43.93	27.36	32.05	–1.23	0.752
College graduate	21.09	17.65	32.55	29.12	–0.01	0.997
Household income						
\$19,999 or less	30.79	33.99	21.67	26.74	–1.88	0.529
\$20,000–\$39,999	30.54	25.27	26.13	27.64	–6.78	0.047
\$40,000 or more	38.67	40.75	52.20	45.62	8.66	0.031
Metropolitan statistical area						
Resident	79.61	85.22	78.27	84.95	–1.07	0.771
Non-resident	20.39	14.78	21.73	15.05	1.07	0.771

Notes: Data are weighted using NSFG sample weights. Boldface indicates statistical significance at $p < .05$ or below after adjustment for multiple comparisons using the Benjamini-Hochberg procedure. Estimates are presented as percentage-points. The differential change column presents results from an interaction variable between exposure group (women 19 to 25 years old) versus control group status (women 27 to 34 years old) and an indicator variable for the pre-policy (2006–2009) or post-policy (2011–2013) period. Standard errors are adjusted for the sampling stratum and cluster.

Table 2
Difference-in-differences estimates of utilization among young adult women associated with the dependent coverage provision.

Dependent variable	Difference-in-difference (SE)	p-Value
Received birth control method/prescription	0.36 (3.80)	0.925
Received counseling or information about birth control	1.15 (2.73)	0.674
Received check-up/medical test for birth control	–1.37 (3.59)	0.703
Received counsel/test/treatment for STD	–0.23 (2.71)	0.931
Lacked health insurance or coverage	–9.09 (3.06)	0.003

Notes: Data are weighted using NSFG sample weights. Boldface indicates statistical significance at $p < .05$ or below after adjustment for multiple comparisons using the Benjamini-Hochberg procedure. Estimates are presented as percentage-points. Model is adjusted for age, marital status, race/ethnicity, labor force participation, household income, education, metropolitan residence, and year fixed effects. Standard errors are adjusted for the sampling stratum and cluster.

differential dependent coverage insurance gains by race/ethnicity, it is possible that there were racial differences in resulting changes in utilization (Hall et al., 2012; Akosa Antwi et al., 2013; Shane and Ayyagari, 2014; Breslau et al., 2017; O'Hara and Brault, 2013). To examine whether there were racial differences in the effects of the provision on healthcare utilization, data were stratified by the woman's

race/ethnicity and results from the models were estimated separately for non-Hispanic Black women, non-Hispanic White women, and Hispanic women. NSFG-provided sample weights were used for all analyses with standard errors adjusted for the sampling stratum and cluster.

Lastly, as the contraceptive mandate went into effect in August 2012, the difference-in-differences models for birth control outcomes were run again with the post-period limited to prior to this mandate to ensure that this policy change was not driving any observed differences in birth control utilization for the main results or stratified outcomes (Appendix Table A3).

3. Results

Table 1 summarizes the demographic characteristics of respondents before and after dependent coverage implementation by exposure group status. Compared to older women, younger women are less likely to be married or divorced consistently between the two time periods. Women 19–25 were less likely in 2011–2013 to have less than high school education than in 2006–2009 relative to women 27–34. Having an income between \$20,000–39,999 decreased from the pre-policy to post-policy period for women 19–25 relative to women 27–34 and having an income of \$40,000 or more increased from the pre-policy to post-policy period. The differential change column shows that differences in these characteristics between periods were not statistically significant after adjustment for multiple comparisons using the Benjamini-Hochberg procedure (Benjamini and Hochberg, 1995).

Observed patterns in income levels may be due to the Great Recession, which occurred December 2007 to June 2009. There are no

Table 3
Difference-in-differences estimates of utilization among young adult women associated with the dependent coverage provision, stratified by race/ethnicity.

Dependent variable	Difference-in-difference (SE)	p-Value
Non-Hispanic black women (N = 1651)		
Received birth control method/prescription	0.22 (7.10)	0.975
Received counseling or information about birth control	4.18 (5.86)	0.477
Received check-up/medical test for birth control	-7.78 (6.16)	0.208
Received counsel/test/treatment for STD	-0.24 (6.68)	0.971
Lacked health insurance or coverage	-1.56 (6.32)	0.806
Non-Hispanic white women (N = 3759)		
Received birth control method/ prescription	-4.31 (5.35)	0.421
Received counseling or information about birth control	1.09 (3.98)	0.784
Received check-up/medical test for birth control	-3.24 (5.00)	0.518
Received counsel/test/treatment for STD	1.42 (3.76)	0.706
Lacked health insurance or coverage	-10.65 (4.18)	0.011
Hispanic women (N = 1830)		
Received birth control method/prescription	13.54 (6.74)	0.046
Received counseling or information about birth control	-2.14 (4.80)	0.657
Received check-up/medical test for birth control	14.56 (6.54)	0.027
Received counsel/test/treatment for STD	-5.78 (5.61)	0.304
Lacked health insurance or coverage	-16.95 (5.54)	0.003

Notes: Data are weighted using NSFG sample weights. Boldface indicates statistical significance at $p < .05$ or below after adjustment for multiple comparisons using the Benjamini-Hochberg procedure. Estimates are presented as percentage-points. Model is adjusted for age, marital status, labor force participation, household income, education, metropolitan residence, and year fixed effects. Standard errors are adjusted for the sampling stratum and cluster.

significant differences in labor market participation, suggesting that any difference in incomes may be due to women accepting jobs with lower pay, rather than women experiencing lower levels of employment. Due to the potential for demographic characteristics to influence sexual and reproductive health utilization, all demographic characteristics presented are used as controls in the models.

The difference-in-differences results for the effects of the dependent coverage provision on sexual and reproductive service utilization are presented in Table 2. There were no significant effects of the provision on utilization in the last 12 months for birth control method or prescription, birth control counseling or information, check-ups or medical test related to birth control, or service utilization for STDs. The dependent coverage provision was associated with a significant decrease in the probability of lacking health coverage in the last 12 months by 9.09 percentage points.

Implementation of the dependent coverage provision was associated with differential changes in sexual and reproductive services utilization by race/ethnicity (Table 3). There were no significant changes in any sexual and reproductive service utilization among non-Hispanic Black women or non-Hispanic White women. Among Hispanic women, the provision was associated with a significant increase in the probability of receiving a birth control method or prescription by 13.54 percentage

points and receiving check-ups or medical tests for birth control by 14.56 percentage points. The dependent coverage provision was associated with a significant reduction in lacking health insurance coverage among non-Hispanic White women by 10.65 percentage points and among Hispanic women by 16.95 percentage points, and was not significantly lower among non-Hispanic Black women.

There was no significant difference in the results when alternate probit and logistic regression models were used for the difference-in-differences (Appendix Table A2). All results showed effects in consistent directions and there was no change in significance among the alternate models.

Results were largely consistent with main findings when models were limited to prior to the August 2012 contraceptive coverage mandate for the birth control outcomes in overall and stratified models (Appendix Table A3). Consistent with the main tables, the provision was not associated with significant changes in birth control outcomes overall or for non-Hispanic Black women or non-Hispanic White women. In this model, Hispanic women exhibited an increased probability of receiving birth control methods or prescriptions by 12.90 percentage points associated with the dependent coverage provision, compared to an increased probability of 13.54 percentage points in the main models. Similarly, Hispanic women exhibited an increased probability of receiving check-ups or medical tests for birth control by 16.03 percentage points in this model, compared to an increased probability of 14.56 percentage points in the main models. These findings suggest that the contraceptive coverage mandate is not the main driver of the observed increases in utilization for the birth control outcomes.

4. Discussion

The dependent coverage provision was associated with a significant decrease in lacking health insurance coverage, but had no effect on any measures for sexual and reproductive health services overall. No significant effects are seen among non-Hispanic Black women for the sexual and reproductive health utilization measures or for insurance coverage. In stratified analyses, Hispanic women saw an increase in receiving birth control methods or prescriptions and check-ups or medical tests related to birth control associated with the provision. Both non-Hispanic White women and Hispanic women saw significant decreases in lacking health insurance in the last 12 months in stratified models. This ACA provision did not appear to increase receipt of counseling or information about birth control or service utilization for STDs for any groups.

The differential effect of the dependent coverage provision on young women by race/ethnicity could indicate differences in pre-policy access, availability, or needs. The literature suggests that disparities in contraceptive use among Hispanic women may be in part driven by access to healthcare, which could explain why Hispanic women exhibit an increase in some birth control utilization measures with increased access while non-Hispanic White and non-Hispanic Black women do not (Grady et al., 2015).

The lack of an effect on birth control counseling and STD service utilization for all models could indicate that women were finding ways of accessing these services independent of their health insurance prior to the coverage provision. With the availability of free or low-cost birth control and STD tests at centers and clinics, it is possible that the utilization of these services among young adult women is not sensitive to health insurance. Prior to the dependent coverage provision, one in four women utilizing contraceptive services reported seeking services at a publicly funded clinic (Frost, n.d.). These findings could imply that young women's utilization of these services are not contingent on insurance access overall, that gaining insurance does not influence service utilization, or that there were only relatively small changes in insurance due to crowd-out of alternative coverage options for some groups (Chen, 2018).

This study's findings could alternatively suggest effects on

utilization that are specific to gaining parental insurance coverage. Some research has indicated that young adults may be less likely to utilize sexual and reproductive health services when using their parent's health insurance, potentially due to concerns regarding confidentiality (Loosier et al., 2018). Early findings indicate a significant reduction in insurance use for sexual and reproductive health services by young women newly eligible for parental insurance under the dependent coverage provision (Ellison et al., n.d.). However, findings on use of parental insurance for sexual and reproductive services are mixed. One study found that young adults with parental insurance utilized reproductive health services at a rate comparable to young adults with alternative insurance, suggesting that confidentiality concerns are not driving differences in service utilization by coverage type (Andrasfay, 2018). It is possible that differences in concerns or responses to gaining parental health insurance could be driving differences in utilization associated with the dependent coverage provision by race/ethnicity.

Differences in the effects of the coverage provision on service utilization could be the result of differences in the ability of these groups to gain insurance from this policy (Breslau et al., 2017; O'Hara and Brault, 2013). As the coverage provision was not significantly associated with changes in insurance among non-Hispanic Black women, it is possible that a lack of insurance gains can explain the lack of response in health service utilization for this group. The decreased probability of lacking insurance was largest among Hispanic women, suggesting that these larger insurance gains could be driving the effects that are present only among Hispanic women.

Finally, it is possible that providers are differentially following guidelines for reproductive health services based on implicit bias and racial norms regarding who needs care, counseling, and contraception. Studies have found that this bias can shape provider's contraceptive recommendations or approaches and there may be differential practices for reproductive care recommendations by race/ethnicity (Dehlendorf et al., 2010; Higgins et al., 2016).

Previous findings have been mixed regarding the effects of the dependent coverage provision on young women's sexual and reproductive health, with lower fertility rates, higher STD rates, and increased long-term hormonal contraceptive utilization, and no effect on overall contraceptive use or on pap tests (Han et al., 2014; Heim et al., 2018; Abramowitz, 2018; Oney, 2018). This study is the first to examine the effects of the dependent coverage provision on STD services utilization, and uses broader outcomes to measure birth control access than previous studies by including birth control counseling and information, birth control check-ups and medical tests, and receipt of birth control prescriptions and methods. In addition, this study was the first to focus on racial and ethnic differences in response to the dependent coverage expansion on young adult women's sexual and reproductive health services overall.

4.1. Limitations

This study has several limitations. Firstly, not all young adults will be gaining parental insurance under the dependent coverage provision. Changes in lacking health coverage overall are used as a proxy in this study and changes in parental insurance coverage are not directly observed. In addition, the NSFG is based on personal interviews, is subject to response and recall bias and may not capture the full extent of a respondent's coverage or service utilization. Secondly, stratified analyses by race/ethnicity could have resulted in small sample size bias and increased variability in the results. Further stratification by race/ethnicity is limited due to the categorization in the NSFG, so differences cannot be examined further. Future research using a healthcare claims database would not be subject to response or recall bias and could have larger sample sizes for more in-depth analyses. Thirdly, this study cannot account for physicians differentially following guidelines or recommendations for preventive services (Dehlendorf et al., 2010; Higgins et al., 2016). Fourthly, state-level policies mandating coverage

for young adults preceded the ACA and could not be controlled for in the study, as state identifiers were not available. As a result, some young adults already had access to parental coverage throughout the duration of this study. It is additionally possible that the implementation of this provision resulted in crowd-out of alternative coverage options, resulting in smaller gains in insurance (Chen, 2018). Lastly, it is possible that any changes in utilization were not a direct result of changes in dependent coverage insurance eligibility. For example, the Great Recession, which occurred December 2007 to June 2009, may have resulted in lower levels of utilization for some services during this time due to increased price sensitivity as well as lower levels of insurance access due to lower levels of employment, although there are no observed differences in labor market participation in this data.

5. Conclusions

These findings are largely consistent with recent literature that has suggested little change in women's utilization of sexual and reproductive health services following the ACA and studies that indicate that increases in access to health care may be insufficient to increase utilization of preventive services (Arora and Desai, 2016; Trudeau and Conway, 2018; Law et al., 2016; Bearak and Jones, 2017; Kim and Look, 2018; Bloodworth et al., 2018). However, other studies have observed an increase in young adults' healthcare utilization associated with the dependent coverage provision (Han et al., 2014; McClellan, 2017; Vujicic et al., 2014; Daw and Sommers, 2018). These findings may indicate that while this policy increased utilization of other health services, it did not result in increased utilization of the preventive sexual and reproductive health services in this study for young adults overall.

This study suggests that the provision may be associated with an increase in birth control methods or prescriptions and check-ups or medical tests only among Hispanic women, with no effects on receipt of birth control counseling or information or receipt of STD services for any groups. It may be that pre-policy sexual and reproductive health service needs for these outcomes were not sensitive to health insurance coverage among young adult women, but birth control outcomes for Hispanic women increase with improved healthcare access. It is possible that these needs were being met among most young adult women regardless of their insurance status through the availability of care at women's centers and clinics. Alternatively, it could be that the dependent coverage provision does not increase sexual and reproductive service utilization for some groups due to young adult women's concerns regarding confidentiality when using parental insurance. Targeted efforts to increase young women's access to sexual and reproductive health services could include increasing confidentiality for sexual and reproductive health service utilization, so that young adults can freely use their parental insurance when accessing care. This study adds to the knowledge base of the effects of the ACA on sexual and reproductive health service utilization and the specific effects of the dependent coverage provision on young adult women's health care utilization.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.ypmed.2019.105863>.

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