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Original article

Trends in Sexual Experience, Contraceptive Use, and Teenage Childbearing: 1992–2002

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Abstract

Purpose: To examine how cohort trends in family, individual, and relationship characteristics are linked to trends in adolescent reproductive health outcomes to provide a better understanding of factors behind recent declines in teenage birth rates.

Methods: We examine a sample of three cohorts of females and males aged 15–19 in 1992, 1997, and 2002, based on retrospective information from the 2002 National Survey of Family Growth. We identify how family, individual, and relationship characteristics are associated with the transition to sexual intercourse, contraceptive use at first sex, and the transition to a teen birth.

Results: Cohort trends and multivariate analyses indicate changes in family and relationship characteristics among American teens have been associated with positive trends in reproductive health since the early 1990s. Factors associated with improvement in adolescent reproductive health include positive changes in family environments (including increases in parental education and a reduced likelihood of being born to a teen mother) and positive trends in sexual relationships (including an increasing age at first sex and reductions in older partners). These positive trends may be offset, in part, by negative changes in family environments (including an increased likelihood of being born to unmarried parents) and the changing racial/ethnic composition of the teen population.

Conclusions: Recent increases in the U.S. teen birth rate highlight the continued importance of improving reproductive health outcomes. Our research suggests that it is important for programs to take into consideration how family, individual, and relationship environments influence decision-making about sex, contraception, and childbearing.

Keywords: Teenage childbearing; Sexual activity; Contraceptive use; Trends; Adolescence

Although the U.S. teen birth rate increased by 3% between 2005 and 2006, the overall teen birth rate has decreased by almost a third since 1991 [1,2]. National trends also show declines in sexual experience and increases in contraceptive use among teens [3,4]. However, researchers, advocates, and policy makers disagree about whether the decline in teen birth rates is because of increases in abstinence [5] or to increases in contraceptive use or more effective method use among sexually active teens [6–8].

A better understanding of the changing context of adolescence may help explain trends in teenage childbearing and its proximate determinants (sexual experience and contraceptive use). Using data from males and females in the 2002 National Survey of Family Growth, we examine cohort trends in family, individual, and relationship characteristics and how these characteristics are associated with the timing of first sex, contraceptive use at first sex, and the transition to a teen birth. We hypothesize that changes in family environments, individual characteristics, and teens' relationships and partners may

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contribute to changing reproductive health behaviors among U.S. teens.

Background

Family environments

A large body of research links family background factors with adolescent sexual behavior and teenage childbearing. Male and female adolescents from two-parent families initiate sex later than teens from other types of families, and are more likely to use contraception when they do have sex [9–12]. Female adolescents whose mothers were teens at their first birth are at higher risk of teen childbearing than daughters of older mothers [9,13]. Higher parental education is associated with a later timing of first sexual intercourse, greater contraceptive use at first sex, and a lower risk of teen pregnancy and teen births [9,11]. Female adolescents whose mothers worked outside the home have sex at an earlier age; however, they are less likely to have a teen pregnancy compared to females whose mothers did not work [11].

Demographic trends show major changes in the composition of U.S. families since the early 1990s, which have implications for trends in reproductive health. For example, recent increases in education (especially among females) [14] and decreases in the likelihood that adolescents will have a mother who was a teen at her first birth [1] may lead to improved reproductive health in the next generation, as has been suggested by analyses of trends in teenage childbearing among females in the 1970s to 1990s [9–11]. In contrast, increases in single-parent families may counterbalance these trends [15].

Family environment hypotheses. Improvements in maternal education and reductions in the percentage of mothers who were teens at birth will be associated with improvements in adolescent reproductive health outcomes across cohorts. Increases in nonmarital childbearing and single-parent families will lead to increased risk of teenage childbearing.

Individual characteristics. Teens' individual characteristics such as race/ethnicity and immigrant status are also associated with sexual behavior. Black adolescents initiate sexual activity earlier than white or Hispanic adolescents [11,16]; however, they are more likely to use condoms [17], whereas Hispanics use condoms less consistently [4,18]. White adolescents, however, are more likely than both black and Hispanic adolescents to use *any* contraceptive method [19], and have lower odds of experiencing a teen birth [11]. Foreign-born adolescents are less likely to transition to sex than adolescents born in the United States, but more likely to give birth once they initiate sex [20]. Among females, biological factors, including an early age at menarche, are associated with an earlier timing of sex [21,22], and, according to some research, reduced odds of a teen birth [13,23].

Individual hypotheses. We hypothesize that changes in individual factors, including the changing racial/ethnic composition of the teen population, will be associated with trends in teenage childbearing. Specifically, increasing numbers of Hispanics and immigrants in the United States [24] will be associated with delays in sexual experience, reductions in contraceptive use, and potentially higher rates of teenage childbearing. Furthermore, declines in age at menarche among females [25] may contribute to earlier sexual initiation and a higher rate of teen births.

Relationship characteristics. Characteristics of teens' sexual relationships and partners are associated with their reproductive health behaviors. For example, a younger age at first sex and having an older sexual partner (especially among females) are associated with reduced contraceptive use[19,26] and greater risk of a teen birth [27,28]. Casual sexual partners (versus romantic or steady partners) are also associated with reduced contraceptive use at first sex [19,26], whereas an extensive literature finds lower *condom* use and consistency in romantic relationships compared with more casual relationships [17,29].

Relationship hypotheses. We know little about long-term changes in the sexual relationships among teens. However, increased media and research attention has been given to casual or ''hook-up'' sex [30,31], suggesting that sex with casual partners may be increasingly common among teens. Increases in casual relationships or older partners may be linked to reductions in contraceptive use and increased risk of a teen birth. In contrast, trends toward a later age at first sex would be linked to increases in contraceptive use and reduced likelihood of a teen birth.

Because both males and female are involved in reproductive health decision making that may lead to teenage childbearing, we examine whether family, individual, and relationship factors are associated with outcomes among both males and females. Some research, for example, suggests that family background factors and characteristics of early sexual relationships exert a stronger influence on sexual behavior among females, compared with males [28,32,33]. Thus, because of gender differences in reproductive health behaviors and their predictors, we examine factors separately for males and females.

Data and Methods

We used data from the 2002 National Survey of Family Growth (NSFG) male and female data files for our analyses. The survey, conducted by the National Center for Health Statistics, was administered to 7,643 females and 4,928 males between the ages of 15 and 44, with oversamples of Hispanics, African Americans, and teenagers.

To examine trends over time, we created cohorts of teens aged 15–19 in 1992 (aged 25–29 in 2002), 1997 (aged 20–24 in 2002), and 2002, restricted to those who were living in the

United States during their teenage years. Analyses of sexual experience used a sample of 3,516 female teens (1,114 in 1992, 1,273 in 1997, and 1,129 in 2002) and 2,563 male teens (600 in 1992, 858 in 1997, and 1,105 in 2002). (For the 1992 and 1997 cohorts, we created a measure of their teen interview date, calculated as the 2002 interview date minus 120 and 60 months, respectively. We created our sample of unmarried teens aged 15–19 in 1992, 1997, and 2002 based on this ''interview date.'' From our original sample of 3,795 females aged 15–19 in 1992, 1997, or 2002, we removed 267 who did not live in the United States at interview date and 12 with missing data on date of migration to the United States. From our sample of 2,761 males, we removed 198 who did not live in the United States. For analyses of contraceptive use at first sex and the transition to a teen birth, we eliminated those respondents who were not sexually experienced before age 20 or who had missing data on outcomes. The final sample of sexually experienced teens consisted of 1,869 females (646 in 1992, 681 in 1997, and 542 in 2002) and 1,359 males (364 in 1992, 453 in 1997, and 542 in 2002).

Measures

We examined three outcomes in our analyses: transition to sex, contraceptive use at first sex, and transition to a teenage birth (for females only, because there were too few male teenage births). For the *transition to sex* outcome, we censored respondents who reached the cohort interview date without having had sex. *Contraceptive use at first sex* is a dichotomous measure of whether respondents reported using condoms, birth control pills, other hormonal method, injectable, intrauterine device, diaphragm, foam, sponge, suppository or other insert, and/or jelly. For the *teen birth* outcome, we censored those who did not have a child before the cohort interview date.

We examined individual, family, and first sexual experience characteristics as predictors of our outcomes variables. *Individual characteristics* include age, race/ethnicity, foreign-born status, and, for females only, early menarche (age 12 or younger). *Family background characteristics* include a four-level measure of respondent's family structure at age 14 (shown in Table 1), whether the respondent was born to married parents, mother's labor force status when the respondent was aged 5–15, whether the respondent's mother was a teenager at her first birth, and highest parental education. *Characteristics of first sexual experience* include age at first sex, the age difference between the respondent and his/her first sexual partner and relationship type at first sex, comparing those who were cohabiting, engaged, or going steady with those in more casual relationships (just friends, went out once in a while, just met, or other).

Analytic methods

For bivariate analyses, we used chi-square and *t*-test analyses to examine cohort trends in predictor and outcome variables. In addition, we used chi-square analyses to compare the percentage who were sexually experienced and who used contraception at first sex, across categories of the independent variables. We used life table analyses to provide analyses of the probability of transitioning to a teen birth. In multivariate analyses, we used event history analyses to predict the transition to first sex and the transition to a teen birth; we used logistic regression analyses to model contraceptive use at first sex. All analyses were weighted and run in Stata to control for the complex sampling design of the NSFG [34].

Results

Bivariate results

Table 1 summarizes sample characteristics by cohort and gender. Among female and male teens, there was a decrease between 1992 and 2002 in the proportion who ever had sexual intercourse. During the same time period there was an increase in the proportion of teens that used a contraceptive method at first sex. There was only a nonsignificant cohort decline in the proportion of females with a teen birth, among all teens and among sexually experienced teens. Table 1 also shows increasing trends among males and females in the proportion having a mother who works full time and having a parent with at least some college education, and a decrease in the proportion having a mother who was less than age 20 at her first birth. Among females only, Table 1 shows an increase in average age and the proportion born to unmarried parents. Among males only, we see trends toward an increase in age at first sex, as well as a decrease in the proportion with a first partner 3 or more years older.

Table 2 presents bivariate associations between the predictor variables and the three outcomes, for females. All individual and family background characteristics were associated with sexual experience. Specifically, those who were born outside of the United States, lived with two biological or adoptive parents, and had a parent who completed some college or more were less likely to be sexually experienced, whereas a younger age, black race/ethnicity, early age at menarche, being born to unmarried parents, and having a mother who works full time or was a teen mother were associated with a greater likelihood of sexual experience. Most individual and family background factors were also associated with contraceptive use at first sex and a teen birth in the expected direction. Further, females who were younger at first sex and whose partners were 5 or more years older than them were less likely to use a contraceptive method at first sex and more likely to have a teen birth, whereas those in casual relationships were less likely to use contraception.

Table 3 presents similar findings for males. Several individual and family background characteristics were associated with sexual experience and/or contraceptive use in the expected direction. In addition, a younger age at first sex, having a partner 3 or more years older, and being in a casual relationship were all associated with reduced contraceptive use for males.

Table 1
Sample characteristics among females and males ages 15–19 in 1992, 1997 and 2002

	Female					Male				
	1992	1997	92 vs. 97	2002	92 vs. 02	1992	1997	92 vs. 97	2002	92 vs. 02
Dependent variables										
Ever had sex	55.8%	48.8%	*	46.6%	**	61.2%	49.2%	**	45.9%	***
Contraceptive use at first sex[a]	61.8%	65.7%		72.0%	***	64.5%	68.5%		78.7%	***
Nonmarital teen birth	23.8%	21.0%		18.5%		—	—		—	
Nonmarital teen birth[a]	32.7%	30.8%		27.0%		—	—		—	
Individual characteristics										
Mean age	16.9	16.9		17.1	*	17.1	17.0		17.1	
Race/ethnicity										
Hispanic	12.7%	13.9%		15.1%		15.0%	15.6%		15.2%	
Non-Hispanic white	67.5%	65.4%		64.0%		67.4%	66.2%		64.2%	
Non-Hispanic black	15.1%	14.5%		15.3%		12.5%	13.2%		14.6%	
Non-Hispanic other	4.7%	6.3%		5.6%		5.2%	5.0%		6.0%	
R was born outside of the U.S.	7.6%	7.4%		7.4%		8.2%	7.5%		7.4%	
Early age at menarche (younger than 12)	24.2%	20.3%	*	25.3%		—	—		—	
Family background characteristics										
Family structure at age 14										
Two biological/adoptive parents	65.9%	69.5%		63.3%		71.5%	70.1%		68.5%	
One biological and one adoptive/step parent	13.4%	11.5%		12.8%		11.4%	8.3%		12.4%	
Single biological parent	11.2%	12.1%		14.4%		9.3%	14.6%		12.2%	
Other	9.5%	6.9%		9.4%		7.9%	7.0%		6.9%	
R's parents married at R's birth	85.9%	84.8%		80.3%	**	88.5%	85.4%		84.3%	
Mother's labor force status (when R ages 5–15)					***					*
Full-time	50.2%	56.2%		59.3%		49.9%	56.3%		57.9%	
Any part-time	23.1%	19.5%		23.7%		25.0%	23.2%		24.8%	
Did not work for pay	26.8%	24.3%		17.0%		25.1%	20.6%		17.2%	
Mother was a teen at first birth	36.4%	32.5%		31.5%	*	33.0%	29.7%		25.0%	*
Highest level of parent education			*		*					*
Some college or more	59.4%	65.4%		65.2%		60.8%	64.5%		69.4%	
Average parent education(1–4)	2.8	2.9	*	2.9	**	2.9	2.9		3.0	
Characteristics of first sexual experience										
Average age at first sex	15.0	15.1		15.3		14.7	14.7		15.0	*
Age difference with first partner	—	—		—						*
Partner younger	—	—		—		17.1%	19.1%		16.7%	
Partner same age	—	—		—		33.0%	36.6%		36.5%	
Partner 1–2 years older	—	—		—		32.5%	27.5%		38.0%	
Partner 3+ years older	—	—		—		17.4%	16.8%		8.9%	
Age difference with first partner										
Partner same age or younger	19.3%	19.5%		19.2%		—	—		—	
Partner 1–2 years older	43.2%	41.6%		44.5%		—	—		—	
Partner 3–4 years older	18.9%	23.7%		23.5%		—	—		—	
Partner 5+ years older	18.6%	15.3%		12.9%		—	—		—	
Relationship with partner at first sex										
Cohabiting, engaged, going steady with partner at first sex	72.5%	70.8%		78.4%		44.9%	53.2%		50.3%	
Just friends, went out once in a while, just met, other	27.5%	29.2%		21.6%		55.1%	46.8%		49.7%	
N=	1,114	1,273		1,129		600	858		1,105	

* $p < .05$; ** $p < 0.01$; *** $p < 0.001$.
[a] Sexually experienced teens (N = 11,869 females and N = 1,359 males).

Multivariate results

Table 4 shows results from multivariate analyses among females. Event history analyses of the transition to first sex show that being in the 2002 cohort (vs. 1992), Hispanic race/ethnicity, being born outside of the United States, having parents who were married at the respondent's birth, and having a parent who completed some college or more were associated with lower odds of sexual experience. In contrast, older age, an early age at menarche, living in a family structure other than two biological/adoptive parents, and having a mother who was a teen at her first birth were associated with greater odds of sexual experience. Columns 2 and 3 show results from logistic regression models predicting contraceptive use at first sex. In Model 1, 2002 cohort (vs. 1992) and higher parental education were associated with greater odds of contraceptive use among females, whereas Hispanic race/ethnicity and early age at menarche were associated

Table 2
Probability of sexual experience, contraceptive use at first sex, and probability of a birth by individual, family, and first sexual experience characteristics, among teen females

	Sexually experienced	Contraceptive use at first sex	Transition to a teen birth
Individual characteristics			
R's current age	***		
15	22.6%	58.3%	4.9%
16	36.4%	61.2%	11.5%
17	51.4%	69.3%	12.3%
18	65.8%	70.4%	22.7%
19	75.8%	66.1%	29.0%
Race/ethnicity	***	***	***
Hispanic	46.5%	50.0%	52.8%
Non-Hispanic white	48.8%	70.9%	21.3%
Non-Hispanic black	61.4%	62.1%	39.3%
Non-Hispanic other	45.2%	68.4%	46.0%
R's country of origin	*	**	**
Born in the U.S.	50.9%	67.6%	28.3%
Born outside of the U.S.	40.9%	49.6%	53.9%
Age at menarche	***	***	**
12 years old or older	47.6%	69.3%	26.4%
Younger than 12 years old	58.5%	58.8%	42.7%
Family background characteristics			
Family structure at age 14	***	*	***
Two biological/adoptive parents	44.0%	67.2%	24.2%
One biological and one adoptive/step parent	63.6%	73.0%	39.1%
Single biological parent	59.9%	63.0%	42.0%
Other	63.4%	57.9%	38.2%
R's parents marital status at R's birth	***	*	***
Unmarried	62.2%	60.7%	49.7%
Married	48.0%	68.1%	26.1%
Mother's labor force status (when R ages 5–15)	*		
Full-time	52.3%	65.7%	25.7%
Any part-time	43.9%	72.4%	32.8%
Did not work for pay	50.3%	64.7%	35.0%
Mother's age at first birth	***		***
20 years old or older	44.4%	68.6%	21.6%
Younger than 20 years old	61.3%	63.0%	43.0%
Highest level of parent education	***	***	***
High school or less	59.9%	60.8%	44.9%
Some college or more	44.5%	71.4%	19.3%
Characteristics of first sexual experience		***	***
Age at first sex	—		
≤14	—	56.5%	49.8%
15	—	68.4%	30.2%
16	—	70.1%	29.7%
17	—	73.8%	18.8%
18–19	—	78.6%	6.5%
Age difference with first partner	—	***	***
Partner same age or younger	—	69.9%	26.9%
Partner 1–2 years older	—	69.5%	21.8%
Partner 3–4 years older	—	68.6%	29.4%
Partner 5+ years older	—	50.8%	56.8%
Relationship with partner at first sex		***	
Cohabiting, engaged, going steady with partner at first sex	—	54.2%	33.7%
Just friends, went out once in a while, just met, other	—	70.8%	29.0%
N=	3,516	1,869	1,869

* $p < .05$; ** $p < 0.01$; *** $p < .001$.

Table 3
Probability of sexual experience and contraceptive use at first sex by individual, family, and first sexual experience characteristics, among teen males

	Sexually experienced	Contraceptive use at first sex
Individual characteristics		
R's current age	***	
15	23.3%	60.8%
16	41.4%	70.2%
17	51.9%	75.1%
18	62.3%	73.5%
19	74.0%	67.5%
Race/ethnicity	***	*
Hispanic	66.6%	59.5%
Non-Hispanic white	45.4%	73.3%
Non-Hispanic black	67.8%	74.7%
Non-Hispanic other	41.9%	65.4%
R's country of origin		***
Born in the U.S.	51.0%	72.0%
Born outside of the U.S.	55.9%	54.6%
Family background characteristics	***	
Family structure at age 14		
Two biological/adoptive parents	46.8%	70.9%
One biological and one adoptive/step parent	64.0%	72.6%
Single biological parent	58.2%	71.9%
Other	66.4%	62.8%
R's parents marital status at R's birth	**	
Unmarried	61.8%	64.1%
Married	49.8%	71.7%
Mother's labor force status (when R ages 5–15)	*	
Full-time	54.9%	72.1%
Any part-time	47.3%	70.7%
Did not work for pay	47.2%	65.2%
Mother's age at first birth	***	*
20 years old or older	46.7%	73.5%
Younger than 20 years old	62.7%	64.6%
Highest level of parent education	***	
High school or less	59.1%	66.5%
Some college or more	47.4%	73.5%
Characteristics of first sexual experience		
Age at first sex		**
<=14	—	62.4%
15	—	72.4%
16	—	82.0%
17	—	70.7%
18–19	—	75.4%
Age difference with first partner	—	**
Partner younger	—	71.6%
Partner same age	—	75.4%
Partner 1–2 years older	—	71.6%
Partner 3+ years older	—	54.5%
Relationship with partner at first sex	—	***
Cohabiting, engaged, or going steady with partner at first sex	—	64.4%
Just friends, went out once in a while, just met, other	—	76.8%
N=	2,563	1,359

* $p < .05$; ** $p < .01$; *** $p < .001$.

with reduced odds. Model 2 added characteristics of first sexual experience to predict contraceptive use. All findings from Model 1 persisted. Additionally, an older age at first sex and being in a steady relationship were associated with greater odds of contraceptive use at first sex, whereas being born outside of the United States was associated with reduced odds.

In Model 1 of the transition to a teen birth, having a parent who completed some college or more was associated with lower odds of having a teen birth. Being nonwhite, living with a single biological parent or without any biological parent, and having a mother who was a teenage mother were associated with greater odds of a teen birth. Model 2 added characteristics of first sex and all findings from

Table 4
Odds ratios from event history and logistic regression models predicting the transition to first sexual intercourse, contraceptive use at first sex, and transition to a nonmarital birth, among females

		Contraceptive use at first sex		Transition to a teen birth	
	Transition to first sex	Model 1	Model 2	Model 1	Model 2
Cohort					
1992	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
1997	0.90	1.24	1.24	0.91	0.93
2002	0.77**	1.68**	1.58**	0.81	0.89
Individual characteristics					
R's current age	1.06*	1.06	0.99	0.87	0.92
Race/ethnicity					
Hispanic	0.83*	0.51***	0.51***	2.54***	3.02***
Non-Hispanic white	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Non-Hispanic black	1.04	0.84	0.87	1.66**	2.00***
Non-Hispanic other	0.82	1.03	1.04	2.92**	3.60***
R was born outside of the U.S.	0.65**	0.64	0.59*	1.13	1.14
Early age at menarche (younger than 12)	1.41***	0.67**	0.75*	1.22	0.92
Family background characteristics					
Family structure at age 14					
Two biological/adoptive parents	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
One biological and one adoptive/step parent	1.56***	1.38	1.48	1.40	1.29
Single biological parent	1.50***	0.91	0.94	1.62**	1.47*
Other	1.65***	0.74	0.88	1.67*	1.22
R's parents married at R's birth	0.79**	1.09	1.04	0.83	0.82
Mother's labor force status (when R ages 5–15)					
Full-time	1.10	0.87	0.90	0.84	0.84
Any part-time	0.89	1.25	1.28	0.89	0.93
Did not work for pay	(1.00)	(1.00)	(1.00)	(1.00)	(1.00)
Mother was a teen at first birth	1.31***	0.98	0.98	1.47**	1.34*
Parent completed some college or more	0.74***	1.40**	1.30*	0.54***	0.57***
Characteristics of first sexual experience					
Age at first sex	—	—	1.17***	—	0.78***
Age difference with first partner	—	—		—	
Partner same age or younger	—	—	(1.00)	—	(1.00)
Partner 1–2 years older	—	—	1.03	—	0.99
Partner 3–4 years older	—	—	1.21	—	1.23
Partner 5+ years older	—	—	0.76	—	1.60*
Cohabitating, engaged, or steady relationship with partner at first sex	—	—	1.67***	—	1.76**
N=	3,516	1,869	1,869	1,869	1,869
Wald chi-square[a](DF)	276.19 (16)***	—	—	194.73 (16)***	376.62 (21)***
F statistic[b](DF)	—	5.18 (16)***	5.70 (21)***	—	—

* $p < .05$; ** $p < .01$; *** $p < .001$.
[a] Model statistic for transition to first sex and birth.
[b] Model statistic for contraceptive use at first sex.

Model 1 persisted except for living without any biological parent. In addition, an older age at first sex was associated with lower odds of a teen birth, whereas having a partner who was 5 or more years older (compared with a same-age or younger partner) and being in a steady (vs. casual) relationship were associated with greater odds of a teen birth. In separate analyses, we ran Model 1 among the full sample of females (including those who were not sexually experienced) and found similar results (not shown here).

Table 5 presents analyses of sexual experience and contraceptive use among males. The first column shows that being born in 1997 or 2002 (vs. 1992) and having parents who completed some college or more were associated with reduced odds of first sex. Hispanic or non-Hispanic black race/ethnicity, living without two biological or adoptive parents, and having a mother who worked full time or was a teen mother at first birth were associated with increased odds of first sexual experience.

Among males, being in the 2002 cohort (vs. 1992) and having parents who were married at the respondent's birth were associated with greater odds of contraceptive use at first sex, whereas being born outside the United States was associated with reduced odds of contraceptive use. In Model 2, the 2002 cohort was still associated with greater odds of contraceptive use, but being born outside the United States and parent's marital status were no longer significant. Additionally, non-Hispanic black race/ethnicity and an older age at

Table 5
Odds ratios from event history and logistic regression models predicting the transition to first sexual intercourse and contraceptive use at firtst sex, among males

		Contraceptive use at first sex	
	Transition to first sex	Model 1	Model 2
Cohort			
1992	(1.00)	(1.00)	(1.00)
1997	0.72**	1.25	1.19
2002	0.63***	2.05**	1.91**
Individual characteristics			
R's current age	1.03	1.00	0.92
Race/ethnicity			
Hispanic	1.71***	0.67	0.72
Non-Hispanic white	(1.00)	(1.00)	(1.00)
Non-Hispanic black	1.94***	1.24	1.58*
Non-Hispanic other	1.00	0.89	0.93
R was born outside of the U.S.	0.85	0.60*	0.62
Family background characteristics			
Family structure at age 14			
Two biological/adoptive parents	(1.00)	(1.00)	(1.00)
One biological and one adoptive/step parent	1.54**	1.02	1.05
Single biological parent	1.37**	0.99	1.15
Other	1.62***	0.76	0.87
R's parents married at R's birth	0.96	1.50*	1.34
Mother's labor force status			
Full-time	1.30**	1.13	1.25
Any part-time	1.14	1.03	1.10
Did not work for pay	(1.00)	(1.00)	(1.00)
Mother's age at first birth	1.22*	0.78	0.94
Parent completed some college or more	0.82*	1.06	1.00
Characteristics of first sexual experience			
Age at first sex	—	—	1.21***
Age difference with first partner	—	—	
Partner younger	—	—	0.69
Partner same age	—	—	(1.00)
Partner 1–2 years older	—	—	0.86
Partner 3+ years older	—	—	0.58*
Cohabitating, engaged, or steady relationship with partner at first sex	—	—	1.42
N=	2,563	1,359	1,359
Wald chi-square[a](DF)/F statistic[b](DF)	214.20 (15)***	2.97 (15)***	3.99 (20)***

* $p < .05$; ** $p < .01$; *** $p < .001$.
[a] Model statistic for transition to first sex and birth.
[b] Model statistic for contraceptive use at first sex.

first sex were linked with greater odds of contraceptive use, whereas having a partner 3 or more years older was associated with reduced odds.

Discussion

Our analyses show dramatic reductions in sexual experience and increases in contraceptive use for teens between 1992 and 2002, a trend that reflects other national data [3,4]. Teen birth rates have also shown dramatic declines across the same time period, although our data show only a nonsignificant decline in teen births across the three cohorts. Differences between our estimates and Vital Statistics data may be because of smaller sample sizes and the age distributions of our cohort samples. Our analyses support hypotheses that changes in teens' family environments and sexual relationships may have contributed to improvements in reproductive health behaviors.

Changes in family environments

We found both positive and negative cohort trends in family environments. Specifically, our analyses support the hypothesis that cohort increases in parental education and declines in the likelihood of having a mother who was a teenager at first birth may help contribute to improvements in teenage reproductive health behaviors. Higher parental education is protective against an early transition to sex (among males and females) and with increased contraceptive use and reduced odds of a teen birth (among females), supporting previous research linking positive trends in maternal education to improvements in teen reproductive health [9–11]. In contrast, being born to a teenage mother is associated with an earlier

timing of first sex among males and females and with increased odds of a teen birth among females, consistent with other research showing poorer reproductive health outcomes among children of teenage parents [9,13]. Cohort declines in the likelihood of being born to a teenage mother may thus help explain improved reproductive health outcomes for males and females over time, which supports findings from one other study in the mid-1990s [9]. This finding shows that improving reproductive health outcomes in one generation may help improve outcomes among their adolescent children.

Our findings also indicate, however, that positive family trends may be offset, in part, by increases in nonmarital childbearing and single-parent families. Being born to unmarried parents is associated with a more rapid transition to sexual experience among females and with reduced odds of contraceptive use at first sex for males, whereas growing up in a family structure outside of two biological parents is associated with earlier sex for males and females and increased odds of a teen birth for females, supporting other research indicating the importance of family structure for reproductive health [10,11]. Cohort increases in the percentage of children born outside of marriage and national data showing increases in single-parent families [35] may thus counterbalance more positive changes in family environments.

Changes in first sexual relationships

As hypothesized, we found that changes in sexual relationships across cohorts may help explain improved patterns of reproductive health. For example, an older age at first sex is linked to increased contraceptive use for males and females and reduced odds of a teen birth for females, supporting previous research [19,26–28]. Declines across the three cohorts in teen sexual experience and increases in the average age at first sex among males match national trends [3,4] and support previous research finding that national changes in adolescent sexual activity influence trends in teenage childbearing [5–7,9]. However, more recent data indicate that sexual experience among high school age teens may be increasing [36], which may lead to poorer reproductive health outcomes into the future.

Having an older sexual partner is associated with poorer reproductive health outcomes, including reduced contraceptive use among males and increased odds of a teen birth among females, which supports other research highlighting potential power differentials in these relationships [27]. The percentage of males with an older partner has declined across cohorts (females showed a nonsignificant decline), perhaps as a result of a later timing of first sex, because the youngest sexually experienced teens are most likely to have an older partner [28]. Expanding the public's awareness of problems associated with older dating and sexual partners may help improve reproductive health outcomes.

Despite media attention to hook-up sexual relationships, we found no cohort trends in casual relationships among teens. However, our research supports other studies showing a protective effect of having a steady (vs. casual) relationship for contraceptive use among girls, possibly because of greater communication about contraception in these more established relationships [37]. But, having a steady first relationship is also associated with greater odds of a teen birth, suggesting that the development of early serious attachments may sometimes be problematic for girls' reproductive health [38].

Changes in individual characteristics

We did not find cohort trends in the racial/ethnic composition of teen populations in our sample; however, Census data project dramatic increases in Hispanic and immigrant populations and small increases in African American populations [24], which may represent a challenge to further reducing teen birth rates into the future if these populations do not also show improvements in individual, family, and relationship environments. Our findings corroborate other research showing higher rates of teenage childbearing among Latinos and African Americans [11]. Specifically, black and Hispanic teen males have an earlier transition to sex, Hispanic females have lower odds of contraceptive use, and nonwhite females have greater odds of a teen birth. In addition, teen immigrant females and those of Hispanic ethnicity have reduced odds of sex, whereas foreign-born males have lower odds of using contraception. In contrast, although black males have an earlier transition to sex, they are also more likely to use contraception. These findings highlight the need for programs that address specific cultural issues in African American, Latino, and immigrant populations [39,40]. In addition, although there were no uniform trends in the timing of menarche across the cohorts in this study, we did find that an early age at menarche among females is associated with greater odds of sex and reduced odds of contraceptive use, supporting other research linking early maturity to early childbearing [13,23].

Limitations

One study limitation is the fairly limited 10-year time period for this study, which may not capture some demographic shifts, such as long-term reductions in age at menarche [25] or even short-term declines in teenage childbearing [2]. Also, we only have information on teens' first sexual relationships, and cannot examine whether subsequent teen relationship histories are associated with reproductive health outcomes. Our analyses of contraceptive use and teenage childbearing are restricted to sexually experienced teens, and factors selecting teens into early sexual experience may also be associated with contraceptive and birth outcomes. Finally, full multivariate models still show cohort differences in the transition to sex and contraceptive use, indicating that additional research is needed to better explain these cohort trends in reproductive health behaviors. However, these limitations are outweighed by the detailed retrospective information for males and females on critical predictors of reproductive health.

Conclusions

We found that improvements in family environments, an increasing age at first sex, and changing partner characteristics help explain improvements in reproductive health outcomes among teens since the early 1990s. However, the recent increase in the U.S. teen birth rate shows the continued importance of improving reproductive health behaviors among teens. Our research suggests that it is important to tailor programs to the unique needs of varied teen populations and take into consideration how family, individual, and relationship environments may influence decision making about sex, contraception, and childbearing. Programs and policymakers should continue to focus on reducing high rates of teenage childbearing in this generation to help improve reproductive health outcomes among the next generation of teens.

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