



Evaluation of Adolescent
Pregnancy Prevention Approaches

OAH Evaluation Report

Impact Report from the Evaluation of Adolescent Pregnancy Prevention Approaches



Final Impacts of the Gender Matters Program

September 2016



Purpose statement: This study reports final impact findings from a large-scale demonstration project and evaluation of the Gender Matters program, an innovative new comprehensive sexuality education curriculum that aims to reduce teen pregnancy and associated sexual risk behaviors, in part by challenging commonly held perceptions of gender roles and promoting healthy, equitable relationships. The study reports final impacts of the program on adolescent sexual risk behaviors and other longer-term outcomes measured 18 months after participants enrolled in the study.

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I. INTRODUCTION

This report presents final impact findings from a demonstration project and evaluation of Gender Matters (Gen.M), an innovative comprehensive sexuality education program that aims to reduce teen pregnancy and associated risk behaviors among U.S. adolescents, in part by challenging commonly held perceptions of gender roles and promoting healthy, equitable relationships. A long-standing body of research links adolescents' gender role beliefs to their sexual and reproductive health outcomes. For both male and female adolescents, traditional attitudes toward gender roles have been correlated with a number of adverse sexual risk behaviors and outcomes, including early sexual initiation, unprotected sex, and teen pregnancy (Jewkes and Morrell 2010; Marcell et al. 2007; Marston and King 2006; Stewart 2003). Several international organizations, and a small number of U.S. organizations, have implemented gender transformative programs that create opportunities for youth to challenge gender norms, with a growing body of evidence demonstrating their effectiveness in improving sexual and reproductive health outcomes (DiClemente et al. 2004; Haberland 2015; Rottach et al. 2009). Despite compelling evidence on the importance of gender in youth risk reduction, Gen.M is one of the few teen pregnancy programs in the U.S. that explicitly address gender norms and dynamics related to adolescent sexual risk behaviors.

In an earlier report, we found several promising short-term effects of the Gen.M program on youth outcomes measured 6 months after study enrollment (Smith et al. 2016). Drawing on data from a rigorous random assignment impact evaluation conducted with a sample of more than 750 youth in Travis County, Texas, we found that youth offered the Gen.M program had greater exposure to information on reproductive health, relationships, prevention of pregnancy and sexually transmitted infections (STIs), and birth control (Smith et al. 2016). They also reported greater knowledge of sources of female birth control and, among female youth, more supportive attitudes toward condom use. However, these short-term effects did not result in reduced rates of sexual activity or unprotected sex six months after study enrollment, or in changes in other mediating factors, such as attitudes toward pregnancy and intentions toward sexual behaviors.

In this report, we extend these results by examining the program's longer-term impacts measured 18 months after youth enrolled in the study. As our primary research question, we examine whether the Gen.M program succeeded in reducing rates of sexual activity and unprotected sex among study youth. As in the earlier report, we also examine program impacts on a range of factors that may mediate these sexual risk behaviors, including knowledge, attitudes, and intentions related to sexual risk behaviors; gender role beliefs; and perceived refusal skills.

The evaluation has involved a unique collaboration and partnership among several organizations. The evaluation was originally designed by faculty at Columbia University's Mailman School of Public Health, in consultation with staff from EngenderHealth. In fall 2010, EngenderHealth was awarded competitive federal grant funding for the evaluation through the Office of Adolescent Health (OAH) of the U.S. Department of Health and Human Services (HHS). In winter 2011, the program was selected as one of seven sites to participate in the Evaluation of Adolescent Pregnancy Prevention Approaches (PPA) study, a major federal effort to expand available evidence on effective ways to prevent and reduce pregnancy and related sexual risk behaviors among teens in the United States. The PPA study is being conducted by

Mathematica Policy Research and its partners, Child Trends and Twin Peaks Partners, LLC, under contract with OAH. Participation in the PPA study provided the Gen.M evaluation with additional resources to support data collection and analysis. In addition, researchers from the PPA evaluation team have collaborated with Columbia University faculty to refine the evaluation design, support data collection, and plan the analysis.

The report is divided into five chapters. In the remainder of this chapter, we describe the Gen.M program, summarize key findings from our earlier interim report, and present the research questions for the final impact analysis. Chapters II and III provide a detailed description of the study design, data, and analytic methods. Chapter IV presents findings from the final impact analysis, and Chapter V summarizes and discusses the implications of the results.

A. The Gen.M program

The Gen.M program is a comprehensive sexuality education program that targets youth ages 14 to 16. It has three interactive components: (1) a 20-hour curriculum-based educational workshop, (2) a four-month text message/Facebook campaign that reinforces workshop messages, and (3) a community film screening that further underscores the messages from the workshop and social media campaign. The program design was guided primarily by three psychosocial behavioral change theories. First, the workshop curriculum draws on elements of social cognitive theory, which posits that youth learn behaviors by observing peers and practicing their knowledge and skills in their own environments. Second, the curriculum applies the theory of gender and power to guide youth in examining how gender norms and power dynamics in relationships influence sexual risk behaviors and teenage pregnancy. Finally, the program applies social norm theory by exploring, questioning, and attempting to change perceived social norms about gender and pregnancy through its three components.

1. Gen.M educational workshop

The Gen.M curriculum is delivered to small, mixed-gender groups of 12 to 15 youth over five consecutive days. The five four-hour workshop sessions feature interactive educational and skill-building activities facilitated by one male and one female facilitator. Each session focuses on one of five themes (Table I.1) that support the program's emphasis on understanding gender, building healthy relationships, and developing skills to prevent pregnancy and STIs. Activities conducted during the workshop sessions are designed to highlight and reinforce six core messages tied to the program's five thematic areas: (1) I am the boss of me, (2) I decide what being a man or a woman means to me, (3) I treat others in the way I want to be treated, (4) I make my own decision about if and when to have sex, (5) I use protection every time I have sex, and (6) I go to the clinic to get tested and protected. These messages are posted on the classroom wall during each workshop session and are reinforced during each core curriculum activity. The expectation is that sustained exposure to clear messages about positive behaviors will help youth remember the messages and make the targeted behaviors a part of their own lives.

Table I.1. Gen.M workshop sessions

Session	Title	Purpose
1	Understanding Gender and Its Influence on Sexual Behavior	To help youth become aware of, question, and redefine gender norms in ways that promote equitable relationships and promote health and well-being
2	Healthy Relationships	To increase understanding of the characteristics of healthy and unhealthy relationships and build skills to ensure that relationships are fulfilling, enjoyable, and healthy
3	Big Decisions	To help youth understand the challenges of being a teen parent and build skills in setting limits to sexual activity
4	Skills for Preventing Pregnancy	To teach youth about pregnancy and STIs and build skills in preventing both through the consistent and correct use of condoms
5	Taking Action to Prevent Teen Pregnancy	To teach youth about the most widely accessible hormonal and long-acting contraceptives and where to obtain them; in addition, to ask youth to identify personal behaviors they intend to sustain or change to prevent pregnancy

During the workshop sessions, facilitators both lead group discussions to introduce the program themes and messages and guide individual and group activities. In individual activities, participants work independently and produce individual work (for example, assessments and writing assignments) in which they use critical thinking and analysis skills to apply the program themes and messages to their lives. Group activities (such as icebreakers, games, small-group discussions, and role-playing exercises) are used to encourage expression and communication. At the end of each session, facilitators videotape participants' reflections on the day's activities; these reflections are used in the film screening component of the program.

2. Social media campaign

After the one-week workshop, program staff use a four-month social media campaign to reinforce curriculum messages. During the workshop, facilitators invite participants to join a private, supervised Facebook group. After the workshop ends, participants can access information and share thoughts in this group while also maintaining connections formed with other participants during the workshop. In each of the campaign's four months, EngenderHealth staff focus their Facebook postings on one of the program's key messages to stimulate discussion among group participants. After the campaign is over, the Facebook page remains active for ongoing youth-led interactions, discussions, and information sharing.

3. Community film screening

To further reinforce key messages and foster continued participant relationships, the program staff invite participants to a film screening after the educational workshop sessions have ended. The 20-minute film compiles the components of the workshop sessions during which participants were videotaped. In these video segments, participants (in group discussions or individually) detail what they have learned and how they intend to use that information in their lives.

B. Summary of interim impact findings

To assess the impacts of the Gen.M program on youth outcomes, we conducted a large-scale random assignment evaluation involving more than 750 predominately low-income youth in Travis County, Texas, which includes the city of Austin. As discussed in more detail in Chapter II, we recruited study youth through the Travis County Health and Human Services Department’s Summer Youth Employment Program (SYEP), a local youth development program that places teens at local job sites across Travis County for five weeks during the summer. The study population is comprised of youth who applied to participate in the SYEP. Among eligible SYEP applicants who agreed to participate in the study, just over half were randomly assigned to a treatment group that was offered the Gen.M program, and the others were assigned to a control group that was not offered the program. In both research groups, we administered a baseline survey prior to random assignment and follow-up surveys 6 and 18 months after study enrollment.

In an earlier report, we used data from the baseline and first follow-up surveys to assess the short-term impacts of the Gen.M program about 6 months after study enrollment (Smith et al. 2016). As in this report, we measured program impacts on both sexual risk behaviors and mediating outcomes, including exposure to information on sexual and reproductive health topics and changes in knowledge, attitudes, intentions, and refusal skills. The key findings from the interim report are summarized in Table I.2 and discussed in greater detail in the remainder of this section.

Table I.2. Six-month impacts from the Gen.M interim impact report

Measure	Treatment group	Control group	Difference	p-value
Percentage of youth who reported receiving information on the following topics: ^a				
How to say no to sex	92.6	76.1	16.5**	<0.01
Reproduction	92.5	84.6	7.9*	0.03
STIs	87.4	75.5	11.9**	0.01
How to talk to partner about birth control	82.6	54.0	28.6**	<0.01
Methods of birth control	79.5	51.7	27.8**	<0.01
Where to obtain birth control	78.4	48.7	29.7**	<0.01
Relationships and dating	78.4	63.8	14.6**	<0.01
Abstinence	77.2	61.4	15.8**	<0.01
Percentage of youth who reported receiving information from a summer youth program	84.6	42.8	41.8**	<0.01
Knowledge of birth control pills (index score, ranges 0-2) ^b	1.1	1.0	0.1	0.06
Knowledge of condoms (index score, ranges 0-2) ^b	1.0	0.8	0.2	0.06
Percentage of youth reporting they definitely know where to obtain female birth control methods	37.3	22.4	14.9**	<0.01
Views on pregnancy (standardized scale score, ranges -2.6 to 0.9) ^c	0.0003	-0.006	0.0	>0.99
Percentage of youth who strongly agree that:				
Condoms are important to make sex safer	63.6	54.3	9.3	0.08
Condoms should always be used by someone their age during sexual intercourse	73.6	70.8	2.8	>0.99
Female birth control should always be used if someone their age is having sexual intercourse	43.9	41.2	2.7	>0.99

Measure	Treatment group	Control group	Difference	p-value
Beliefs about:				
Masculinity (scale score, ranges 1-4) ^d	3.2	3.2	0.0	>0.99
Males' role in sex (scale score, ranges 1-4) ^e	3.4	3.4	0.0	>0.99
Females' obligation to have sex (individual item, ranges 1-4)	3.5	3.5	0.0	>0.99
Percentage of youth reporting they will definitely:				
Not have sexual intercourse in the next year	28.8	34.0	-5.2	0.43
Use a condom or female birth control method if they have sexual intercourse in the next year	90.6	89.4	1.2	>0.99
Use a condom if they have sexual intercourse in the next year	87.9	84.4	3.5	0.81
Use a female birth control method if they have sexual intercourse in the next year	56.3	46.5	9.8	0.06
Perceived refusal skills (continuous score, ranges 1-4)	3.5	3.5	0.0	0.57
Percentage of youth who reported the following:				
Ever had sexual intercourse	39.8	39.9	-0.1	>0.99
Had sexual intercourse in the past 3 months	22.3	19.9	2.4	0.73
Had unprotected sex in the past 3 months	6.9	6.4	0.5	>0.99
Had sex without a condom in the past 3 months	7.2	9.7	-2.5	0.53

Source: Smith et al. (2016)

^a Questions refer to information received in the 12 months before survey administration. See Smith et al. (2016) for a more detailed description of each measure.

^b This index counts the number of correct responses to two knowledge questions. Possible values range from 0 to 2, with higher values indicating more correct responses.

^c Standardized scale measure based on three survey items, with higher values indicating stronger attitudes against becoming pregnant or getting a partner pregnant. The interitem reliability (alpha) equals 0.61 for the full sample, 0.66 for females, and 0.57 for males at six months.

^d This scale averages responses to four questions on beliefs about masculinity. Possible values range from 1 to 4, with higher values indicating a less traditional perspective on masculinity. The interitem reliability (alpha) equals 0.58 for the full sample, for females, and for males at six months.

^e This scale averages responses to six questions on males' role in sex. Possible values range from 1 to 4, with higher values indicating greater disagreement with statements asserting that boys should have sexual intercourse early and have sex with many girls, and that it is acceptable to pressure girls to have sex. The interitem reliability (alpha) equals 0.79 for the full sample, 0.75 for females, and 0.81 for males at six months.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

As shown in Table I.2, we found that the Gen.M program had large and statistically significant impacts on youth exposure to information on a range of reproductive health and sexual education topics. The program had particularly large impacts on receipt of information on birth control. Compared to youth in the control group, youth in the treatment group were nearly 30 percentage points more likely to report receiving information on how to talk to a partner about birth control (82.6 versus 54.0 percent), birth control methods (79.5 versus 51.7 percent) and where to obtain birth control (78.4 versus 48.7 percent). Estimated differences in exposure to other sexual and reproductive health topics ranged from a low of 7.9 percentage points (receiving information on reproduction) to a high of 16.5 percentage points (receiving information on how to say no to sex). Youth in the treatment group were also twice as likely to report receiving information on the topics examined from a summer youth program, suggesting the Gen.M program was a key source of information among treatment group youth.

We also found some evidence of short-term program effects on knowledge and attitudes. Youth in the treatment group reported greater knowledge of sources of female birth control, with 37.3 percent of treatment group youth reporting that they definitely knew where to obtain female

birth control, compared to 22.4 percent of youth in the control group. Among females, youth in the treatment group also reported more supportive attitudes toward condom use to make sex safer (not shown). However, we found no evidence of program effects on other mediating outcomes, including intentions toward sexual activity and contraceptive use and gender attitudes (Table I.2). This may be because youth in both the treatment and control groups reported relatively strong attitudes against becoming pregnant and supporting condom use and had nontraditional (egalitarian) gender role beliefs. On a pregnancy attitudes scale ranging from -2.6 to 0.9, with higher values indicating stronger attitudes against pregnancy, the mean was zero for both the treatment and control groups. Consistent with attitudes supporting pregnancy prevention, over 70 percent of youth in both study groups reported that they strongly believed condoms should always be used during sexual intercourse. Finally, for each of our measures of gender role beliefs, whose values range from 1 to 4 (with higher values indicating less traditional values), the mean score was high (between 3.2 and 3.5) for both the treatment and control groups.

We found no statistically significant impacts on sexual behaviors 6 months after study enrollment. Approximately 40 percent of youth in both the treatment and control groups reported some lifetime exposure to sexual activity, and roughly one-fifth reported having sexual intercourse in the past three months. Rates of unprotected sex in the past three months were low (under 7 percent) in both study groups, reflecting relatively low rates of recent sexual activity and high rates of contraceptive use among youth who reported having recent sexual activity. Youth in the study sample reported lower levels of sexual risk behaviors at the time of the 6-month follow up than were anticipated given the at-risk population targeted by the SYEP. For example, rates of sexual activity for control group youth at the 6-month follow-up were roughly 5 percentage points lower than the state average for youth of comparable age in 2013 (20 percent for control group youth compared to 25 percent among 10th graders in Texas) (Centers for Disease Control [CDC] 2013).

C. Research questions

This report adds to these findings by examining the program's longer-term impacts measured about 18 months after study enrollment. As with the interim impact report, we start by examining 18-month impacts of the program on measures of knowledge, attitudes, and intentions. As described above, our interim report found that the Gen.M program had mixed effects on these key mediators of sexual risk behaviors. To assess the extent to which program effects on potential mediating outcomes persisted or emerged over a longer time period, we use data from the 18-month survey to answer the following research questions:

1. Does the Gen.M program have longer-term impacts on knowledge of birth control methods and where to access them?
2. Does the Gen.M program have longer-term impacts on attitudes toward pregnancy and contraceptive use?
3. Does the Gen.M program have longer-term impacts on attitudes toward gender roles?
4. Does the Gen.M program have longer-term impacts on intentions to have sexual intercourse and unprotected sex in the near future?
5. Does the Gen.M program have longer-term impacts on perceived sexual refusal skills?

The study was ultimately designed to assess the program's success in reducing youth sexual risk behaviors, including rates of sexual activity and unprotected sex. These outcomes align with the overarching goals of the program and serve as primary indicators of the program's overall success. Although we did not find evidence of program impacts on sexual behaviors at the time of the 6-month survey, rates of sexual activity were relatively low among study youth at that point in time. To examine longer-term program impacts on sexual risk behaviors of interest, we use data from the 18-month follow up survey to answer the following questions:

6. Does Gen.M reduce rates of sexual activity among youth?
7. Does Gen.M reduce the incidence of unprotected sex among youth?

We had also planned to assess the impacts on the Gen.M program on the incidence of pregnancy. However, so few pregnancies were reported in the final follow-up survey for either study group that we did not assess program impacts on this outcome.

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II. STUDY DESIGN

This study was designed as a randomized controlled trial involving predominately low-income youth in Travis County, Texas, recruited through the Travis County SYEP. Among eligible youth who agreed to participate in the study, just over half were randomly assigned to a treatment group that was offered the Gen.M program, and the others were assigned to a control group that was not offered the program. Both treatment and control group participants had access to existing sexual and reproductive health programs and services offered to Travis County youth. We calculated program impacts of the Gen.M program by comparing outcomes for the treatment and control groups about 18 months after study enrollment.

In this chapter, we begin by describing enrollment and retention of study participants. We then discuss the baseline characteristics of the study sample. We end by providing a summary description of the treatment and control conditions. The next chapter describes the data, measures, and analytic methods used to estimate impacts of the Gen.M program.

A. Sample enrollment and retention

The study population was made up of Travis County youth who applied to participate in the Travis County SYEP program. A joint venture of the city of Austin and the Travis County Health and Human Services department, the SYEP places roughly 750 youth between ages 14 and 18 at job sites throughout Travis County for five weeks during the summer. Although the SYEP is offered to all youth attending public schools in Austin/Travis County, the program focuses recruitment on youth who are low income, are at risk, or have special needs. The 12 zip codes from which SYEP primarily draws its participants account for 80 percent of teen births and many of the STI cases in Travis County, and these zip codes have the lowest median family income in the county. Most of the population in these zip codes is African American or Latino (EngenderHealth 2010).

The SYEP is offered twice each summer, with five-week sessions starting in early June and mid-July. Due to limitations in the number and size of SYEP job sites, not all youth who apply to the SYEP can receive job assignments. Youth employed by the SYEP work four hours per day for five weeks during one of the two sessions. For three consecutive summers starting in 2012, the 20-hour Gen.M curriculum was delivered to program participants the week after the end of each SYEP summer session. (In 2013, a third Gen.M workshop session was also delivered.) To increase program participation, EngenderHealth offered youth assigned to the treatment group an incentive payment equal to the weekly payment youth receive for participating in the SYEP (\$150 per week). Only those youth who attended all 20 hours of the weeklong Gen.M workshop received the incentive payment.

To be eligible for the study, SYEP applicants had to be between ages 14 and 16, have obtained parental consent to participate in the evaluation, and have completed a baseline survey. While all study participants were SYEP applicants, some were not accepted into the SYEP program. Recruitment of youth for the study took place annually between January and July. During the early consent phase (January to April), recruitment efforts targeted a large number of potentially eligible youth, with the expectation that attrition would be high between consent and the baseline survey administration later in the summer.

From January to April of each year, the SYEP conducts a series of 15-hour job readiness trainings (JRTs) for youth interested in the SYEP. Parents of interested youth are required to attend the first session of this training to learn more about the program, complete the program application, and sign a consent form allowing their child to participate in the SYEP. During these initial sessions, EngenderHealth program staff told parents about Gen.M and the potential opportunity for their child to participate in the program as part of an evaluation study. Parents who wanted their child to have a chance at participating in Gen.M and agreed to have their child participate in the evaluation were asked to return a signed evaluation consent form at the end of the JRT session. Efforts were also made to recruit SYEP applicants outside of the JRTs.

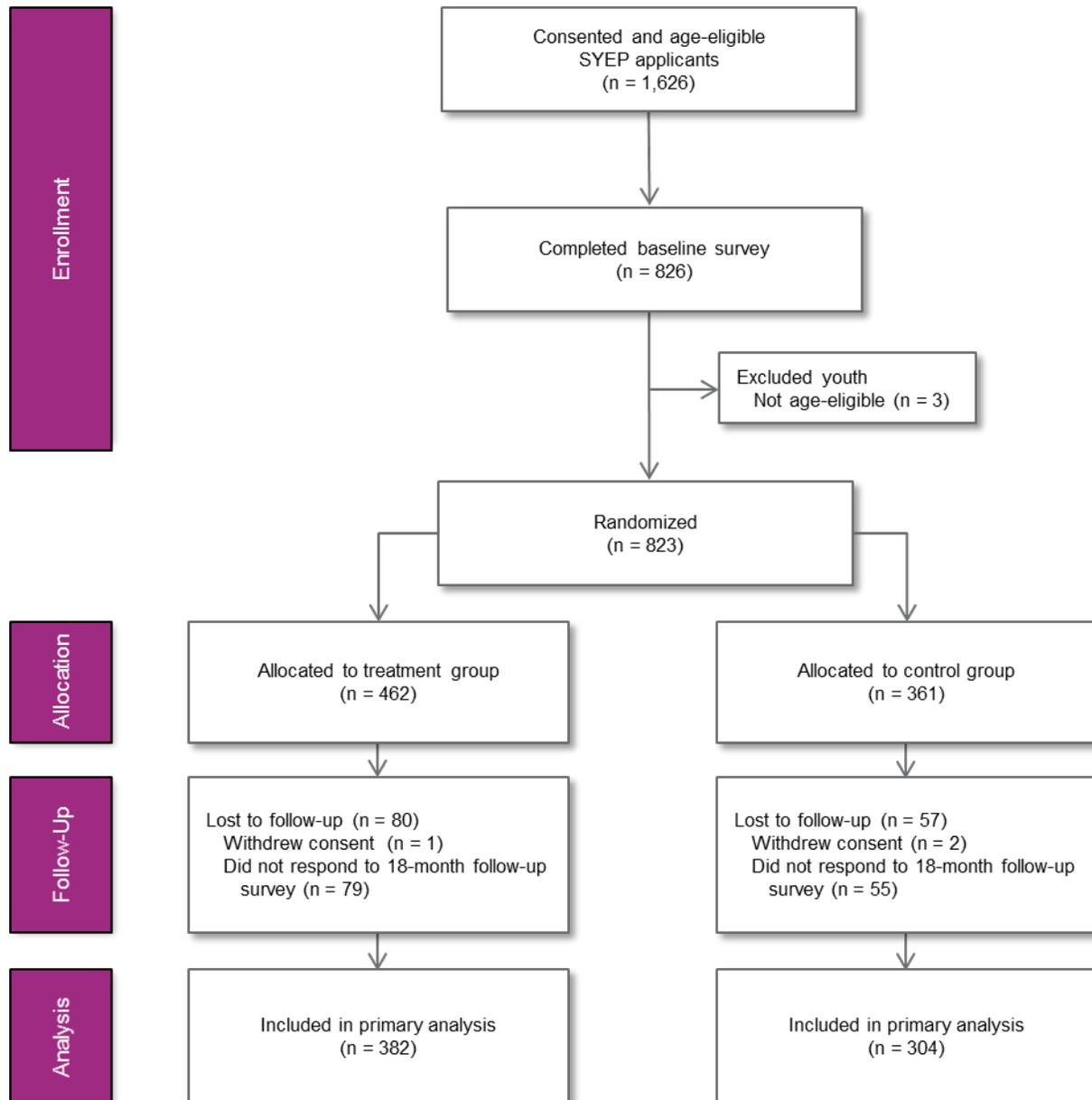
Between late May and July of each year, age-eligible consented youth were invited to complete a paper-and-pencil baseline survey questionnaire. Youth were invited to participate in a group baseline survey administration in June or July. Youth were invited to the baseline survey administration closest to the start of the Gen.M workshop they would be offered if they were selected to receive the intervention. Only those youth who completed the baseline survey were considered eligible for random assignment.

Sample enrollment and random assignment were managed through a secure web-based system. Mathematica staff entered all age-eligible, consented youth into the system on a rolling basis as signed parental consent forms were received from SYEP applicants. After each round of baseline data collection, eligible, consented youth who had completed the baseline survey questionnaire were randomly assigned by Mathematica staff using SAS, a statistical software package. The random assignment procedure was designed to take into account four factors: (1) the minimum and maximum number of youth who could participate in scheduled Gen.M workshops, (2) youth availability to attend the scheduled workshops (determined by SYEP job assignment results and information provided on the baseline survey sign-in sheets), (3) the need for roughly equal numbers of male and female youth in each workshop group, and (4) the need to assign siblings as a unit to either the treatment or control group. To achieve this, random assignment was stratified by gender, availability for Gen.M workshops, and sibling status (as needed). This resulted in 23 random assignment blocks across the three summer cohorts of youth enrolled in the study. Within each block, participants were assigned to the treatment or control group; the probability of assignment to the treatment group varied across blocks in order to achieve the targeted number of youth and gender balance in each Gen.M workshop group. Shortly after random assignment, youth were informed by telephone and mail of their assignment status and, if applicable, the Gen.M workshop session to which they were assigned.

The sample enrollment process yielded a total sample of 823 youth (Figure II.1). This study sample was obtained from a larger target population of age-eligible SYEP applicants, 1,626 of whom provided consent and were invited to take the baseline survey. Of these age-eligible, consented youth, 826 (51 percent) completed the baseline survey, and 823 (51 percent) were randomly assigned. Because not all age-eligible SYEP applicants provided consent for the evaluation and, as anticipated, roughly half of those who did proceeded to take the baseline survey, the study sample is not intended to be a random or representative sample of all youth in the target population. Of the 823 youth randomly assigned, 56 percent (462 youth) were assigned to the treatment group, and 44 percent (361 youth) were assigned to the control group. The treatment group was larger because of the need to have a minimum number of youth in each program group to ensure adherence to the program model.

The retention rate for the study was high (Figure II.1). This report focuses on data from the final follow-up survey, which was administered to youth participants about 18 months after the baseline survey. Of the 462 youth randomly assigned to the treatment group, 382 completed the 18-month follow-up survey, for a response rate of 83 percent. Of the 361 youth assigned to the control group, 304 completed the survey, for a response rate of 84 percent. Appendix A contains a nonresponse analysis examining the characteristics of participants who did not complete the 18-month follow-up survey.

Figure II.1. Overview of sample enrollment and retention



SYEP = Summer Youth Employment Program.

B. Baseline sample characteristics

We examined several characteristics of the treatment and control groups at baseline to characterize our sample of interest and ensure that random assignment resulted in comparable study groups for the final impact analysis. Differences between the treatment and control groups were generally small and none were statistically significant.

The sociodemographic characteristics of the 18-month study sample reflect the characteristics of the population targeted by the Gen.M program (Table II.1). At the time of the baseline survey, the mean age of participants was 15. Roughly half of the study participants were male. The racial characteristics of the population reflect those of the SYEP population: most sample members were black or Hispanic. Only roughly 5 percent of participants reported that the primary language spoken at home was not English. Approximately 40 percent of youth in both study groups reported that religion is very important in their life, and a similar percentage reported that they attend religious services or other related events at least once a week.

Most study participants reported living with one or both biological parents at the time of the baseline survey, with 61 percent reporting living with one biological parent and roughly 30 percent living with both biological parents. Over 80 percent of participants reported that one or both of their parents were employed at the time of the baseline survey. Finally, roughly 60 percent of participants reported feeling very close to or cared for by their mother and roughly 40 percent reported feeling close to their father.

Table II.1. Baseline sociodemographic characteristics

Variable	Treatment group mean	Control group mean	Difference	p-value
Age at random assignment (years)	15.4	15.3	0.1	0.31
Female (%)	52.1	48.7	3.4	0.87
Race/ethnicity (%)				
White, non-Hispanic	3.7	6.6	-2.9	0.09
Black, non-Hispanic	55.5	57.6	-2.1	0.43
Hispanic	36.9	33.6	3.3	0.19
Other race/ethnicity or multiracial	3.9	2.3	1.6	0.34
Main language spoken at home not English (%)	5.3	5.6	-0.3	0.59
Religion (%)				
Religion is very important in life	40.5	42.7	-2.2	0.39
Attend religious services/events weekly	38.3	38.1	0.2	0.79
Family structure (%)				
Lives with both biological parents	32.0	28.4	3.6	0.38
Lives with one biological parent	61.4	61.4	0.0	0.92
Lives with neither biological parent	6.6	10.2	-3.6	0.10
Parents' employment status (%)				
Mother is employed	85.5	86.4	-0.9	0.76
Father is employed	81.5	87.3	-5.8	0.07

Variable	Treatment group mean	Control group mean	Difference	p-value
Relationship with parents				
Feels very close to or cared for by mother	61.2	64.3	-3.1	0.48
Feels very close to or cared for by father	37.0	41.1	-4.1	0.36
Sample size^a	382	304		

Source: Baseline survey administered to study participants before the start of the program.

Notes: Reported means are from weighted regressions that account for the random assignment design. See Appendix B for a description of the measures.

^a Reported sample size is the number of participants who completed the 18-month follow-up survey and are included in the analysis.

Participants reported mixed levels of exposure to information on reproductive health and sexuality education topics at the time of study enrollment, with no statistically significant differences in exposure rates between the two study groups (Table II.2). More than three-fourths of participants said they had received at least some information in the past 12 months on three groups of topics: (1) reproduction; (2) relationships, dating, marriage, and family life; and (3) sexually transmitted infections (STIs). Sixty percent or more said they had received information on abstinence and how to say no to sex. However, fewer than half had received information related to birth control, including information on birth control methods, how to talk to your partner about birth control, and where to obtain birth control.

There were no baseline differences between the study groups in knowledge, attitudes, or intentions related to birth control and pregnancy (Table II.2). Participants had similar levels of knowledge about birth control pills and condoms and similar but low levels of knowledge about sources of female birth control methods, with less than one-quarter of both groups reporting that they definitely knew where to obtain female birth control methods. Participants reported relatively strong attitudes against pregnancy at the time of study enrollment and reported more supportive attitudes toward condom use than use of female birth control methods. Baseline attitudes toward gender roles were also similar between the two study groups.

The study participants reported rates of sexual activity at baseline that were below state averages for high school students of comparable age, with no significant differences in rates between the study groups (Table II.3) (CDC 2013). Roughly 33 percent of participants reported some lifetime experience with sexual intercourse at the time of the baseline survey, compared to a state average of 39 percent for 10th graders; and roughly 17 percent of participants reported having sexual intercourse in the past three months, compared to a state average of 25 percent for 10th graders (CDC 2013). Reported rates of unprotected sex were also low at baseline; fewer than 4 percent of participants reported having unprotected sex and roughly 8 percent of participants reported having sex without a condom in the past three months.

Table II.2. Baseline exposure to information, knowledge, attitudes, and intentions

Variable	Treatment group mean	Control group mean	Difference	p-value
Exposure to information				
In the past 12 months, received information on: (%)				
Reproduction	81.5	80.7	0.8	0.58
Relationships, dating, marriage, and family life	80.9	82.3	-1.4	0.70
STIs	77.6	79.0	-1.4	0.47
How to say no to sex	67.6	68.3	-0.7	0.88
Abstinence	60.1	61.5	-1.4	0.81
Methods of birth control	46.3	48.7	-2.4	0.74
How to talk to your partner about birth control	44.3	48.7	-4.4	0.27
Where to obtain birth control	41.1	38.7	2.4	0.42
Knowledge of birth control methods and sources				
Knowledge of birth control pills (index score, ranges 0–2) ^b	1.1	1.1	0.0	0.41
Knowledge of condoms (index score, ranges 0–2) ^b	0.9	1.0	-0.1	0.29
Percentage of youth reporting they definitely know where to obtain female birth control methods	19.7	22.0	-2.3	0.32
Attitudes toward pregnancy and contraception				
Views on pregnancy (standardized scale score, ranges from -2.6 to 0.9) ^b	0.004	0.07	-0.07	0.28
Percentage of youth who strongly agree that:				
Condoms are important to make sex safer	62.2	59.4	2.8	0.26
Condoms should always be used by someone their age during sexual intercourse	71.8	70.0	1.8	0.59
Female birth control should always be used if someone their age is having sexual intercourse	37.6	35.2	2.4	0.45
Attitudes toward gender roles				
Beliefs about:				
Male gender roles (scale score, ranges 1-4) ^b	3.12	3.05	0.07	0.06
Males' role in sex (scale score, ranges 1-4) ^b	3.42	3.41	0.01	0.87
Females' obligation to have sex (individual item, ranges 1-4) ^b	3.55	3.52	0.03	0.55
Intentions toward sex and contraceptive use				
Percentage of youth reporting they will definitely:				
Not have sexual intercourse in the next year	26.3	26.0	0.3	0.97
Use a condom or female birth control method if have sexual intercourse next year	89.7	84.9	4.8	0.05
Use a condom if they have sexual intercourse in next year	86.5	82.8	3.7	0.18
Use a female birth control method if have sexual intercourse in next year	53.2	48.8	4.4	0.14
Perceived refusal skills				
Perceived refusal skills (continuous score, ranges 1–4)	3.3	3.3	0.0	0.43
Sample size^a	382	304		

Source: Baseline survey administered to study participants before the start of the program.

Notes: Reported means are from weighted regressions that account for the random assignment design. See Chapter III for a description of the measures.

^a Reported sample size is the number of participants who completed the 18-month follow-up survey and are included in the analysis; it does not account for item nonresponse for any measures included in the table.

^b See Chapter III and Appendix B for a detailed description of each measure.

STIs = sexually transmitted infections.

Table II.3. Baseline sexual risk behaviors

Variable	Treatment group mean	Control group mean	Difference	p-value
Ever had sex (%)	32.3	33.8	-1.5	0.98
In the past 3 months: (%)				
Had sexual intercourse	17.3	17.6	-0.3	0.87
Had unprotected sex	3.5	3.8	-0.3	0.68
Had sex without a condom	8.1	8.3	-0.2	0.86
Sample size^a	382	304		

Source: Baseline survey administered to study participants before the start of the program.

Notes: Reported means are from weighted regressions that account for the random assignment design. See Chapter III for a description of the measures.

^a Reported sample size is the number of participants who completed the 18-month follow-up survey and are included in the analysis; it does not account for item nonresponse for any measures included in the table.

C. Treatment and control conditions

Treatment condition. Youth assigned to the treatment group were offered the Gen.M program, including the 20-hour curriculum-based workshop and subsequent social media and film screening activities. The five, 4-hour workshop sessions were delivered on consecutive days in July or August by a pair of trained health educators (one male and one female) from SafePlace, a local organization offering domestic violence prevention services to Travis County youth. Consistent with the program model, each workshop group included 12 to 15 youth and roughly equal numbers of males and females. During the workshops, participants were invited to join a private Facebook group supervised by program staff and to receive text messages on workshop-related topics over a four-month period. Participants were also invited to attend a screening of a film documenting their workshop experiences, compiled from videotaped portions of the Gen.M workshop sessions.

All workshop facilitators received a five-day (40-hour) training in spring 2012, before the first set of Gen.M workshops. During the training, facilitators could practice delivering the curriculum. EngenderHealth held a supplemental training later in the spring to give facilitators more practice discussing sexual and reproductive health topics with youth. After the initial training, EngenderHealth staff held monthly meetings with the facilitators to review logistics for the workshops and discuss fidelity to the curriculum. EngenderHealth staff also monitored program delivery for fidelity through classroom observation and review of fidelity log forms that facilitators completed after each workshop session.

Our implementation study of the Gen.M program found that the program was well implemented (Shapiro 2013). More than 80 percent of youth enrolled in the treatment group completed the 20-hour Gen.M workshop. The high attendance may be a result of tying the Gen.M program to the SYEP, including scheduling the Gen.M workshops as an additional week of SYEP employment and offering an incentive equal to the weekly SYEP payment for attending all five workshop sessions. Implementation study results also suggested that youth were engaged in the program material, which may have influenced continued workshop attendance throughout the week. Facilitators reported that participants' engagement increased over the course of the weeklong curriculum and was highest during interactive activities, such as skits and plays. Program participants reported that they respected the facilitators and felt that the facilitators

treated them as adults and valued their opinions and responses to questions, which led them to participate freely in discussions. Implementation study findings suggested the program content resonated with both male and female youth, in a manner consistent with the program's goals. For example, both male and female youth valued being in control of their own actions and said they would use the strategies Gen.M taught to say no to sex. Females understood that they could defend themselves against peer pressure to date and have sex; males heard that they could make individual choices about sex (that is, to wait to have sex and to not pressure a partner into having sex). The implementation study suggested that younger participants (age 14) had difficulty understanding some of the material because of their more limited experience with sex and dating. A more detailed description of the implementation successes and challenges is provided in the Gen.M implementation report (Shapiro 2013).

Control condition. Youth assigned to the control condition were not offered the Gen.M program, but they had access to any other sexual and reproductive health services available to them in the area. A variety of teen pregnancy prevention interventions were available to teens in Austin/Travis County during the study period (Brazeal et al. 2015). These interventions included a number of evidence-based sexuality education programs, several of which were launched between 2012 and 2014, after the study began. Some of these interventions were implemented under the Personal Responsibility Education Program and OAH Teen Pregnancy Prevention grant initiatives, administered by the Administration for Children and Families and OAH, respectively.

Evidence-based sexuality education programs offered in Austin/Travis County high schools during the study period include (1) REAL TALK, an abstinence-based program that uses the *Reducing the Risk* curriculum for high school students; and (2) *Making Proud Choices!* Several evidence-based sexuality education programs were also available to high school-age youth in community settings, including: (1) Be Proud! Be Responsible! Be Protected!, offered to teen parents; (2) Be Proud! Be Responsible!, offered to homeless, runaway, and foster youth; (3) the Connections Project, which offers the Making Proud Choices! curriculum to youth in foster care and the juvenile justice system; (4) Sisters Saving Sisters, offered to female teens in community- and clinic-based settings; and (5) ¡Cuidate! Peer to Peer Program, which targets high school-age Latino youth.

In addition to these evidence-based sexuality education programs, several other pregnancy prevention programs were available to teens in school, community, and after-school settings during the study period. These include Big Decisions in AISD, offered to Austin Independent School District students in health class, and the Austin Healthy Adolescent Program sexuality education program, an after-school program for youth in juvenile probation.

Still other resources for pregnancy prevention include long-standing sexual and reproductive health services provided through Austin/Travis County community clinics, including the People's Community Clinic and Planned Parenthood of Greater Texas. The Tandem Teen Prenatal and Parenting Program, an interagency collaboration, also provides medical, mental health, educational, vocational, and social support services to teen mothers and their children through several clinics and community organization sites.

Given the large number of pregnancy prevention efforts in Travis County, it is likely that some youth in the Gen.M evaluation sample were exposed to a pregnancy prevention program outside of Gen.M or received other sexual and reproductive health services offered in the area during the study period. However, few, if any, of the other programs offered to high school–age youth incorporate gender content or explicitly address harmful gender norms linked to adolescent sexual risk behaviors. In addition, Table II.2 suggests that the Gen.M program may be more comprehensive than existing programs offered to Travis County youth. Although most study participants reported at baseline that they had received information on relationships, STIs, how to say no to sex, and abstinence, fewer than half reported having received information on topics related to birth control, including methods, sources, and how to talk to your partner about birth control.

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III. DATA, MEASURES, AND ANALYSIS

The analysis presented in this report is based primarily on data from two rounds of surveys completed by youth in both the treatment and control groups. As discussed in Chapter II, youth were required to complete a paper-and-pencil baseline survey questionnaire before random assignment. The survey was administered to groups of youth by trained data collection staff from Mathematica, roughly two to five weeks before the weeklong Gen.M workshop. Each participant received a \$20 gift card for completing the baseline survey. Starting 18 months after the baseline survey, a longer-term follow-up survey was administered by telephone to individual youth by trained Mathematica interviewers. Each participant received a \$25 gift card for completing the 18-month follow-up survey. In the remainder of this chapter, we first describe the outcome measures constructed from the 18-month follow-up survey. We then discuss the analytic methods used to assess the impacts of the Gen.M program on participant outcomes. Appendix B contains more detailed information on the measures.

A. Outcome measures

Drawing on data from the 18-month follow-up survey, we constructed seven groups of outcome measures, each corresponding to one of the study's research questions: (1) knowledge of birth control methods and sources, (2) attitudes towards pregnancy and contraception, (3) attitudes toward gender roles, (4) intentions toward sex and contraceptive use, (5) perceived refusal skills, (6) sexual activity, and (7) unprotected sex. These measures are summarized in Table III.1 and described in greater detail below.

1. Knowledge of birth control methods and sources

To assess the program's effects on youth knowledge of birth control methods and sources, we constructed three different outcomes:

- **Knowledge of birth control pills.** The survey asked youth two questions about the efficacy of birth control pills in preventing pregnancy and STIs: (1) "If birth control pills are used correctly and consistently, how much can they reduce the risk of pregnancy?" and (2) "If birth control pills are used correctly and consistently, how much can they reduce the risk of getting HIV, the virus that causes AIDS?" The five response categories were: not at all, a little, a lot, completely, and don't know. We summed the number of correct responses to these two questions to create an index of knowledge of birth control pills. The index ranges from 0 to 2, with higher values indicating greater knowledge.
- **Knowledge of condoms.** The survey asked youth two questions about the efficacy of condoms in preventing pregnancy and STIs: (1) "If condoms are used correctly and consistently, how much can they reduce the risk of pregnancy?" and (2) "If condoms are used correctly and consistently, how much can they reduce the risk of getting HIV, the virus that causes AIDS?" The five response categories were: not at all, a little, a lot, completely, and don't know. We summed the number of correct responses to these two questions to create an index of knowledge of condoms. The index ranges from 0 to 2, with higher values indicating greater knowledge.
- **Perceived knowledge of female birth control sources.** The survey asked youth to respond to the following statement: "I would know where to go for birth control methods like the pill

or the shot for me or my partner.” The response categories were: definitely true, probably true, probably false, definitely false, and don’t know. We constructed a binary indicator comparing youth who responded definitely true to this statement to youth who provided other responses indicating less certainty about their knowledge of where to access birth control.

Table III.1. Outcome measures

Measure	Definition
Mediating outcomes	
Knowledge of birth control methods and sources	
Knowledge of birth control pills	Index variable: sum of correct responses to two survey questions; variable ranges from 0 to 2, with higher values indicating greater knowledge.
Knowledge of condoms	Index variable: sum of correct responses to two survey questions; variable ranges from 0 to 2, with higher values indicating greater knowledge.
Perceived knowledge of female birth control sources	Binary variable: equals 1 if youth reports that he or she definitely knows where to obtain birth control; equals 0 if youth reports a lower level of perceived knowledge.
Attitudes toward pregnancy and contraception	
Attitudes toward pregnancy	Continuous scale variable: standardized scale based on four survey questions; variable ranges from -2.6 to 0.9, with higher values indicating stronger attitudes against becoming pregnant or getting a partner pregnant (alpha coefficient = 0.67).
Perceived importance of condom use for safe sex	Binary variable: equals 1 if youth reported that he or she strongly agrees that condoms are important to make sex safer; equals 0 if youth did not strongly agree.
Perceived need for consistent condom use	Binary variable: equals 1 if youth reported that he or she strongly agrees that condoms should always be used if a person his or her age has sexual intercourse; equals 0 if youth did not strongly agree.
Perceived need for consistent female birth control use	Binary variable: equals 1 if youth reported that he or she strongly agrees that female birth control should always be used if a person his or her age has sexual intercourse; equals 0 if youth did not strongly agree.
Attitudes toward gender roles	
Beliefs about masculinity	Continuous scale variable: average of responses to four survey questions; variable ranges from 1 to 4, with higher values indicating less traditional views (alpha coefficient = 0.64).
Beliefs about male role in sex	Continuous scale variable: average of responses to six survey questions; variable ranges from 1 to 4, with higher values indicating less traditional views (alpha coefficient = 0.81).
Beliefs about females’ obligation to have sex	Based on a single survey question: variable ranges from 1 to 4, with higher values indicating less traditional views.
Beliefs about importance of boyfriends to girls’ self-esteem (female youth only)	Continuous scale variable: average of responses to three survey questions; variable ranges from 1 to 4, with higher values indicating less traditional views (alpha coefficient = 0.79).
Intentions toward sex and contraceptive use	
Intentions to not have sexual intercourse	Binary variable: equals 1 if youth reported that he or she definitely did not intend to have sexual intercourse in the next year; equals 0 if youth reported more intention.
Intentions to use a female method of birth control	Binary variable: equals 1 if youth reported that he or she definitely intended to use a female birth control method during sexual intercourse in the next year; equals 0 if youth reported less intention.
Intentions to use condoms	Binary variable: equals 1 if youth reported that he or she definitely intended to use a condom during sexual intercourse in the next year; equals 0 if youth reported less intention.

Measure	Definition
Intentions to use a female birth control or condoms	Binary variable: equals 1 if youth reported that he or she definitely intended to use a female birth control method or condom during sexual intercourse in the next year; equals 0 if youth reported less intention.
Perceived refusal skills	
Perceived refusal skills (full sample)	Average of two survey questions; variable ranges from 1 to 4, with higher values indicating greater perceived refusal skills.
Perceived refusal skills (females only)	Continuous scale variable: average of responses to three survey questions; variable ranges from 1 to 4, with higher values indicating greater perceived refusal skills.
Sexual behavior outcomes	
Sexual activity	
Ever had sexual intercourse	Binary variable: equals 1 if youth reported ever having had sexual intercourse; equals 0 if youth reported never having sexual intercourse.
Had sexual intercourse in the past 3 months	Binary variable: equals 1 if youth reported having had sexual intercourse in the past 3 months; equals 0 if the youth did not have intercourse in the past 3 months.
Unprotected sex	
Had unprotected sex in the past 3 months	Binary variable: equals 1 if youth reported that he or she had sexual intercourse without a modern birth control method in the past 3 months; equals 0 if youth did not have unprotected sex.
Had sexual intercourse without a condom in the past 3 months	Binary variable: equals 1 if youth had sexual intercourse without a condom in the past 3 months; equals 0 if participant did not have sex without a condom.

2. Attitudes toward pregnancy and contraception

We constructed four measures of youth attitudes toward pregnancy and birth control use:

- Attitudes toward pregnancy.** The survey asked youth three questions about how they would feel if they became pregnant or got a partner pregnant. The first two questions asked youth whether they agreed or disagreed with the following statements: (1) “Getting pregnant or getting a girl pregnant in the next year or two would hurt your chances of being successful in life”; and (2) “If you got pregnant or got a girl pregnant in the next year or two, your life would become a lot better.” The four possible response categories ranged from strongly agree to strongly disagree. The third question asked youth: “If you got pregnant or got someone pregnant, how would you feel?” For this question, five possible response categories were offered, ranging from very happy to very upset. We combined these three questions into a standardized scale with higher values indicating stronger attitudes against becoming pregnant or getting a partner pregnant.
- Perceived importance of condom use for safe sex.** The survey asked youth if they agreed or disagreed with the following statement: “Condoms are important to make sex safer.” The five possible response categories ranged from strongly agree to strongly disagree. We constructed a binary measure to compare youth who said that they strongly agree to youth who reported a lower level of agreement.
- Perceived need for consistent condom use.** The survey asked youth if they agreed or disagreed with the following statement: “Condoms should always be used if a person your age has sexual intercourse.” The five possible response categories ranged from strongly agree to strongly disagree. We constructed a binary measure to compare youth who said that they strongly agree to youth who reported a lower level of agreement.

- **Perceived need for consistent female birth control use.** The survey asked youth if they agreed or disagreed with the following statement: “Birth control should always be used if a person your age has sexual intercourse.” The five possible response categories ranged from strongly agree to strongly disagree. We constructed a binary measure to compare youth who said that they strongly agree to youth who reported a lower level of agreement.

3. Attitudes toward gender roles

We constructed four measures that assess the extent to which youth subscribe to traditional norms of masculinity and femininity that have been associated with sexual risk behaviors. The measures focus on masculine and feminine ideologies related to male toughness, male sexual roles, females’ sexual role, and the importance of male partners to girls’ self-esteem.

- **Beliefs about masculinity.** The survey asked youth if they agreed or disagreed with four statements reflecting traditional attitudes toward masculinity, such as “The best way for a boy to show he is strong is to act tough” and “In a good dating relationship, the boy gets his way most of the time.” The four possible response categories ranged from strongly agree to strongly disagree. We averaged responses across the four survey items to create a composite scale of youth beliefs about masculinity, with higher values indicating greater disagreement and less traditional attitudes.
- **Beliefs about males’ role in sex.** The survey asked youth if they agreed or disagreed with six statements concerning males’ role in sex, such as “It is embarrassing for a 16-year-old boy if he has never had sexual intercourse,” “One way for a guy to prove he is a real man is to have sex with a lot of girls,” and “It is all right for a boy to pressure a girl to have sex if she has had sex with him in the past.” The four possible response categories ranged from strongly agree to strongly disagree. We averaged responses across the six items to create a composite scale of youth beliefs about male sex roles, with higher values indicating greater disagreement and less traditional attitudes.
- **Beliefs about females’ obligation to have sex.** The survey asked youth if they agreed or disagreed with the following statement: “A girl who really likes a guy needs to have sex with him to prevent him from finding someone else.” The four possible response categories ranged from strongly agree to strongly disagree. The variable ranges from 1 to 4, with higher values indicating greater disagreement and less traditional attitudes.
- **Beliefs about importance of boyfriends to girls’ self-esteem (female youth only).** The survey asked female youth if they agreed or disagreed with three statements concerning the role of boyfriends in teenage girls’ lives, such as “A girl is likely to feel bad about herself if she never has a boyfriend.” The four possible response categories ranged from strongly agree to strongly disagree. We averaged responses across the three items to create a composite scale of the importance of boyfriends to girls’ self-esteem, with higher values indicating greater disagreement and less traditional attitudes.

4. Intentions toward sex and contraceptive use

We constructed four measures of youth intentions toward sexual activity and contraceptive use. Three of the measures are based on three separate survey questions about youth intentions to (1) have sexual intercourse in the next year, (2) use (or have their partner use) female birth control if they have sexual intercourse in the next year, and (3) use (or have their partner use) a

condom if they have sexual intercourse in the next year. For these three questions, the four possible response categories ranged from definitely to definitely not. For each question, we created a binary measure that compares youth who said they definitely do not intend to have sexual intercourse or definitely intend to use birth control if they have sex to youth who report a less strong intention to avoid the risk of pregnancy or an STI.

The fourth measure is a measure of whether youth reported an intention to use a condom *or* a female birth control method if they have sexual intercourse in the next year. For this measure, we combined responses to the two questions asking youth about their intentions to use condoms and female birth control. Based on responses to the two questions, we constructed a binary measure that compares youth who said they definitely intend to use a condom or female method of birth control to youth who reported a less strong intention.

5. Perceived refusal skills

To assess the program's success in building refusal skills among youth, we constructed two versions of a composite measure of perceived refusal skills, one for male youth and one for female youth. The measure for male youth is based on two questions asked of both male and female youth. For these two questions, youth were asked to imagine that they were alone with someone they liked very much and to assess whether they could resist an unwanted sexual advance using the following two questions: (1) "How likely is it that you could stop them if they wanted to touch your private parts below the waist, meaning the parts of the body covered by underwear, and you did not want them to do that?" and (2) "How likely is it that you could avoid having sexual intercourse if you didn't want to?" In addition to the two questions asked of both male and female youth, female youth only were asked a third question: "How likely is it that you could stop them if they wanted to touch your chest and you did not want them to do that?" For all these questions, the four possible response categories ranged from not at all likely to very likely. We averaged responses across the items to create a summary index, with higher values indicating greater perceived refusal skills.

6. Sexual activity

To measure the impact of the program on sexual activity, we constructed two outcomes: (1) a binary (yes/no) indicator for whether youth reported that they had ever had sexual intercourse and (2) a binary (yes/no) indicator for whether youth reported that they had sexual intercourse in the past three months. Each measure was based on a single survey question that was limited to vaginal intercourse and did not include oral or anal sex.

7. Unprotected sex

Among youth who reported having sexual intercourse at least once, the survey used a different series of question for youth who reported having sexual intercourse more than once versus youth who reported having sex only once. Among those who reported having sex more than once, the survey asked youth how many times in the past three months they had sexual intercourse without using (1) a condom and (2) any modern method of birth control. The modern birth control methods specified in the survey were condoms, birth control pills, the shot, the patch, the ring, an IUD, or the contraceptive implant. Among youth who reported having sexual intercourse once, the survey asked youth when they had sex, whether they used modern birth control during sex, and what type of birth control they used, if any.

Based on responses to these two sets of questions, we created two binary (yes/no) indicators for whether a participant reported (1) having unprotected sex in the last three months (defined as having sexual intercourse in the past three months without any modern contraceptive method), and (2) having sex without a condom. Youth who did not have sexual intercourse in the past three months were coded as not having had unprotected sex.

B. Analytic approach

We used a multivariate regression framework to analyze the impact of Gen.M on each outcome. A regression framework is appropriate for this study because it allows us to account for the stratification used for random assignment and differential random assignment probabilities across strata (discussed in Chapter II). It also allows us to improve the precision of our impact estimates by statistically adjusting for any baseline covariates that are strongly correlated with our outcome measures.

We estimated a separate regression model for each outcome. For binary outcome measures (such as ever had sexual intercourse), we estimated impacts using logistic regression models. When reporting results from these models, we calculated mean marginal effects to express the impact estimates as percentage point differences between outcomes for the treatment and control groups. For all other outcomes, we estimated ordinary least-squares (OLS) regression models. We used weights in the regression models to account for variability in the probability of selection to the treatment or control groups across the 23 random assignment blocks. A base weight was calculated for all sample members as the inverse of the probability of random assignment to the treatment or control groups. Since randomization occurred separately within blocks, the base weight was calculated separately by block. Siblings were randomized together, so they are treated as one sample unit in the weight computation. In nearly all cases, two siblings were assigned together, so the sibling adjustment divides the base weight by two. In the one instance in which three siblings were assigned together, the sibling adjustment divides the base weight by three.

Each regression model included the following covariates: a binary indicator for treatment status; three key demographic variables highly correlated with our key outcomes of interest (age, race/ethnicity, and gender); a baseline measure of the outcome (when feasible); and four additional baseline covariates empirically selected because of their strong predictive power and potential to improve the precision of the impact estimates. These additional baseline covariates are measures of (1) attitudes towards pregnancy, (2) beliefs about a males' role in sex, (3) intentions to have sexual intercourse in the next year, and (4) sexual initiation. The last four covariates were selected empirically through a data-driven stepwise selection procedure developed previously in the literature (Social and Character Development Research Consortium 2010). This procedure involves gradually adding covariates to the model in order, from most to least predictive of the outcome (as defined by the *t*-statistic on each covariate's regression coefficient). At the same time, covariates can be removed from the model if their predictive power falls below a minimum defined threshold. The procedure stops when no variable meets the minimum defined threshold of predictiveness. A list of candidate covariates included in the stepwise selection procedure can be found in Appendix B.

We adjusted the p -values for the statistical significance tests from our regression models to account for multiple hypothesis testing. As discussed earlier in this chapter, our analysis uses multiple outcomes to answer some of the key research questions. For example, we constructed three measures of gender role attitudes and two separate measures of sexual activity. Unless we account for this multiplicity, it could increase the chances of making a false discovery and lead to spurious claims about the program's effectiveness. Researchers often declare a finding statistically significant if the probability of falsely rejecting the null hypothesis of no impact is less than 5 percent. However, when conducting separate tests arising from multiple outcomes, the probability of falsely rejecting the null hypothesis in *at least one* of them can be much higher than 5 percent. To correct for this increased probability, we apply a multiple hypothesis testing procedure outlined by Hothorn et al. (2008) and Schochet (2009). This procedure involves adjusting the reported p -value for each test to account for other tests conducted within the same family of related measures. Similar to other common methods of adjusting for multiple hypothesis testing, this procedure yields a 5 percent false positive rate across outcomes within the same family. However, the procedure is less conservative than other common adjustment methods, such as the well-known Bonferroni correction, because it also accounts for any correlation in test statistics among outcomes within the same family.

We made this adjustment separately for each of the seven groups of outcome measures described earlier in this chapter (and presented in Table III.1). That is, we adjusted the p -values accounting for multiple outcomes within each of the seven groups of measures, but not for multiple outcomes measured across the different groups. We followed this approach because each group of outcomes aligns with a different research question. We base our substantive conclusions for each question only on the corresponding group of outcome measures. The number of outcomes measured in other groups has no bearing on our substantive conclusions for each question and therefore does not warrant an additional adjustment for multiple hypothesis testing.

To examine the robustness of our results, we conducted a range of sensitivity tests, including using alternative data-cleaning procedures and specifications of the regression model (see Appendix C). The results presented in Chapter IV are generally robust to these alternative approaches. Because of the Gen.M program's gender focus, we also conducted exploratory analyses to examine program impacts on subsamples of male and female youth (Appendix D). The study was not powered to detect program impacts for male and female youth separately, and the subgroup results should thus be interpreted with caution; the smaller sample sizes for the subgroup analyses reduce our ability to precisely detect smaller differences in outcomes between the treatment and control group. However, the results of the subgroup analyses were generally consistent with the full sample results presented in Chapter IV.

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IV. RESULTS

The Gen.M program had favorable longer-term impacts on key mediating outcomes targeted by the program, including measures of knowledge and attitudes. Youth assigned to the treatment group reported greater knowledge of birth control pills and condoms and greater perceived knowledge of sources of female birth control at the time of the 18-month follow-up survey. They also reported more supportive attitudes toward use of female birth control methods than control group youth. However, we did not find any statistically significant differences between the treatment and control group in attitudes toward pregnancy or condom use, beliefs about gender roles, intentions related to sexual activity and contraceptive use, or perceived refusal skills. Youth in both study groups reported relatively egalitarian views on gender roles, positive attitudes and intentions toward condom use, and high levels of confidence in their refusal skills, leaving limited room for the program to improve upon these outcomes. Finally, we found no evidence of program impacts on youth sexual behaviors 18 months after study enrollment. Similar to the 6-month results, differences between the study groups in rates of sexual activity and unprotected sex were small and not statistically significant.

A. Mediating outcomes

1. Knowledge of birth control methods and sources

The Gen.M program had statistically significant longer-term impacts on youth knowledge of birth control methods and sources (Table IV.1). At the time of the 18-month follow-up survey, youth in the treatment group reported higher levels of knowledge than control group youth for all three of the knowledge measures examined. On our two-item indices of knowledge of the effectiveness of birth control pills and condoms in preventing pregnancy and STIs, index scores were, on average, 0.1 points higher for the treatment group. This difference represents a roughly 10 percent increase in knowledge of birth control pills ($0.1/1.0 = 10$ percent) and condoms ($0.1/0.9 = 10$ percent) for youth in the treatment group relative to the control group. In addition, youth in the treatment group reported higher levels of perceived knowledge of sources of female birth control. Among youth in the treatment group, 34.7 percent reported that they definitely knew where to obtain female birth control, compared to 22.3 percent of youth in the control group. This 12.4 percentage point difference in rates is statistically significant.

Table IV.1. Impacts on youth knowledge of birth control methods and sources

Measure	Treatment group	Control group	Difference	<i>p</i> -value
Knowledge				
Knowledge of birth control pills (index score, ranges 0–2) ^a	1.1	1.0	0.1*	0.04
Knowledge of condoms (index score, ranges 0–2) ^a	1.0	0.9	0.1*	0.02
Percentage of youth reporting they definitely know where to obtain female birth control methods	34.7	22.3	12.4**	<0.01

Source: Youth surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled treatment group and control group are regression-adjusted predicted values of outcomes at the 18-month follow-up survey. All regressions are weighted to account for the random assignment design. Sample sizes accounting for item nonresponse range from 680 to 683, depending on the measure. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

^a This index counts the number of correct responses to two knowledge questions. Possible values range from 0 to 2, with higher values indicating more correct responses.

* Significantly different from zero at the .05 level, two-tailed test.

** Significantly different from zero at the .01 level, two-tailed test.

2. Attitudes toward pregnancy and contraception

Similar to the results of our interim impact analysis, we found limited program impacts on youth attitudes toward pregnancy and contraceptive use at the time of the 18-month follow-up survey (Smith et al. 2016) (Table IV.2). Youth in both the treatment and control groups reported relatively strong attitudes against becoming pregnant or getting a sexual partner pregnant. On a scale ranging from -2.6 to 0.9, with higher values indicating stronger attitudes against pregnancy, the mean was close to zero for both study groups. We also found no difference between the treatment and control groups in attitudes toward condom use. Among treatment group youth, 65.3 percent strongly believed that condoms are important to make sex safe, compared to 59.3 percent of the control group. Although this difference between the study groups is not trivial in size, it is not statistically significant. Almost three-quarters of youth in both study groups reported that they strongly believed condoms should always be used during sexual intercourse (74.8 percent for treatment group and 72.1 percent for the control group).

In contrast to the interim impact results, we find that the Gen.M program had a large and statistically significant impact on youth attitudes toward female birth control at the time of the final follow-up survey. Among treatment group youth, 47.3 percent strongly agreed that female birth control should always be used during sexual intercourse, compared to only 35.9 percent of the control group. This 11.4 percentage point difference is statistically significant. The program's favorable impact on attitudes toward female birth control is consistent with the positive impacts on knowledge reported above, as well as the program's large and statistically significant impacts on exposure to information on birth control at the time of the 6-month follow-up survey (Smith et al. 2016).

Table IV.2. Impacts on youth attitudes toward pregnancy and contraception

	Treatment group	Control group	Difference	p-value
Views on pregnancy (standardized scale score, ranges -2.6 to 0.9) ^a	0.04	-0.01	0.05	>0.99
Percentage of youth who strongly agree that:				
Condoms are important to make sex safer	65.3	59.3	6.0	0.41
Condoms should always be used by someone their age during sexual intercourse	74.8	72.1	2.7	>0.99
Female birth control should always be used if someone their age is having sexual intercourse	47.3	35.9	11.4**	0.01

Source: Youth surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled treatment group and control group are regression-adjusted predicted values of outcomes at the 18-month follow-up survey. All regressions are weighted to account for the random assignment design. Sample sizes accounting for item nonresponse range from 674 to 683, depending on the measure. Reported p-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

^a Standardized scale measure based on three survey items, with higher values indicating stronger attitudes against becoming pregnant or getting a partner pregnant. The interitem reliability (alpha) equals 0.67 for the full sample (0.68 for females and 0.69 for males) at 18 months.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

3. Attitudes toward gender roles

We did not find any evidence that Gen.M affected youth attitudes toward traditional gender ideologies. Both the interim and 18-month impact results suggest that youth in both study groups held relatively egalitarian attitudes toward gender roles. For each of our three full sample measures of gender role attitudes, the values range from 1 to 4, with higher values indicating less traditional attitudes. For the measures of youth beliefs about masculinity, males' role in sex, and females' obligation to have sex, the mean values at the 18-month follow up were between 3.3 to 3.6 for the treatment group and 3.2 and 3.5 for the control group (Table IV.3). These high mean values indicate that most youth in both the treatment and control groups disagreed or strongly disagreed with the traditional ideologies examined.

For the female youth subsample, we also measured attitudes toward the importance of boyfriends to girls' self-esteem. For this measure, the mean was lower than for the other gender attitude measures, at 2.8 for the treatment group and 2.7 for the control group (Appendix D) on a scale of 1 to 4. This finding suggests that female youth held slightly more traditional beliefs about femininity than about other gender norms. The treatment-control group difference for this measure was also not statistically significant.

Table IV.3. Impacts on youth gender role attitudes

Measure	Treatment group	Control group	Difference	p-value
Beliefs about:				
Masculinity (scale score, ranges 1–4) ^a	3.3	3.2	0.1	>0.99
Males' role in sex (scale score, ranges 1–4) ^b	3.5	3.4	0.1	0.08
Females' obligation to have sex (individual item, ranges 1–4)	3.6	3.5	0.1	0.45

Source: Youth surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled treatment group and control group are regression-adjusted predicted values of outcomes at the 18-month post-test survey. All regressions are weighted to account for the random assignment design. Sample sizes accounting for item nonresponse range from 681 to 683, depending on the measure. Reported p-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

^a This scale averages responses to four questions on beliefs about masculinity. Possible values range from 1 to 4, with higher values indicating a less traditional perspective on masculinity. The interitem reliability (alpha) equals 0.64 for the full sample, for females, and for males at 18 months.

^b This scale averages responses to six questions on males' role in sex. Possible values range from 1 to 4, with higher values indicating greater disagreement with statements asserting that boys should have sexual intercourse early and have sex with many girls, and that it is acceptable to pressure girls to have sex. The interitem reliability (alpha) equals 0.81 for the full sample, 0.76 for females, and 0.84 for males at 18 months.

4. Intentions toward sex and contraception

We found no statistically significant differences between the treatment and control group in intentions toward sexual activity or contraceptive use at the time of the 18-month follow-up survey (Table IV.4). In both study groups, roughly 22.5 percent of youth reported that they definitely did not intend to have sex in the next 12 months. Nearly all youth in both study groups reported an intention to use a condom or a female birth control method if they have sexual intercourse in the next year (91.5 percent for the treatment group and 86.2 percent for the control group). The vast majority of youth reported that they definitely intend to use a condom if having sex (88.0 percent for the treatment group and 81.9 percent of the control group). In contrast, only 56.2 percent of treatment group youth and 49.7 percent of control group youth reported that they definitely intend to use a female birth control method if having sex.

Table IV.4. Impacts on youth intentions toward sex and contraceptive use

Measure	Treatment group	Control group	Difference	p-value
Percentage of youth reporting they will definitely:				
Not have sexual intercourse in the next year	22.5	22.2	0.3	> 0.99
Use a condom or female birth control method if they have sexual intercourse in the next year	91.5	86.2	5.3	0.13
Use a condom if they have sexual intercourse in the next year	88.0	81.9	6.1	0.11
Use a female birth control method if they have sexual intercourse in the next year	56.2	49.7	6.5	0.35

Source: Youth surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled treatment group and control group are regression-adjusted predicted values of outcomes at the 18-month post-test survey. Sample sizes accounting for item nonresponse range from 662 to 681, depending on the measure. Reported p-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

5. Perceived refusal skills

We found no statistically significant differences between youth in the treatment and control groups in perceived refusal skills 18 months after study enrollment (Table IV.5). Youth in both study groups reported relatively high levels of confidence in their ability to refuse unwanted sexual contact from someone they know. On a scale ranging from 1 to 4, with higher values indicating greater perceived refusal skills, the mean was 3.6 for both the treatment and control groups.

Table IV.5. Impacts on perceived refusal skills

Measure	Treatment group	Control group	Difference	p-value
Perceived refusal skills (continuous score, ranges 1–4)	3.6	3.6	0.0	0.30

Source: Youth surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled treatment group and control group are regression-adjusted predicted values of outcomes at the 18-month post-test survey. Sample size, accounting for item nonresponse, is 680. Reported p-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

B. Sexual behavior outcomes

We found no evidence of program impacts on sexual behavior outcomes measured at the time of the 18 month follow-up survey (Table IV.6). Roughly half of both treatment and control group youth reported that they had some lifetime experience with sexual intercourse (47.4 percent for the treatment group and 48.4 percent for the control group), and about one-fourth of youth in both study groups reported having sex in the past three months (27.7 percent for the treatment group and 25.0 percent for the control group).

Rates of unprotected sex were still relatively low for both study groups 18 months after study enrollment. About one-tenth of youth reported having sex without a modern birth control method in the past three months (10.2 percent for the treatment group and 9.0 percent for the control group). Similarly, roughly 10 percent of youth in both study groups reported having sex without a condom in the past three months (10.3 percent for the treatment group and 10.2 percent for the control group). None of the small differences between the treatment and control group in the sexual behavior outcomes examined were statistically significant.

Table IV.6. Impacts on youth sexual activity

Measure	Treatment group	Control group	Difference	<i>p</i> -value
Sexual activity				
Percentage of youth who reported the following:				
Ever had sexual intercourse	47.4	48.4	-1.0	> 0.99
Had sexual intercourse in the past 3 months	27.7	25.0	2.7	0.69
Unprotected sex				
Percentage of youth who reported the following:				
Had unprotected sex in the past 3 months	10.2	9.0	1.2	> 0.99
Had sex without a condom in the past 3 months	10.3	10.2	0.1	> 0.99

Source: Youth surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled treatment group and control group are regression-adjusted predicted values of outcomes at the 18-month post-test survey. Sample sizes accounting for item nonresponse range from 600 to 686, depending on the measure. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

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V. DISCUSSION AND CONCLUSION

This report presents the final 18-month impact findings from a large-scale demonstration project and evaluation of the Gen.M program, an innovative comprehensive sexuality education program that aims to reduce teen pregnancy and related sexual risk behaviors among high school–age youth by addressing unhealthy gender norms. In an earlier report based on data collected 6 months after program enrollment, we found positive short-term impacts of the program on key intermediate outcomes associated with youth sexual risk behaviors, including receipt of information on a range of sexual and reproductive health topics; knowledge of sources of female birth control; and, among female youth, attitudes toward condom use. In the present report, we examined whether program impacts on key intermediate outcomes were sustained or emerged 18 months after study enrollment and whether the program was successful in achieving its longer term goal of reducing sexual risk behaviors among study youth.

Our findings show that the Gen.M program had significant longer term impacts on youth knowledge and attitudes. At the time of the 18-month follow-up survey, youth in the treatment group reported higher levels of knowledge of birth control pills and condoms and sources of female birth control than youth in the control group. They also reported more supportive attitudes toward female birth control use. However, program impacts on these key mediating outcomes did not result in reduced rates of sexual activity or unprotected sex 18 months after study enrollment, or in changes in other key mediating factors (such as attitudes toward pregnancy and intentions toward sexual risk behaviors). We also find no evidence of program impacts on gender role beliefs, a key focus of the program.

To examine potential explanations for our mixed results, we explored the possibility that the link between youth gender attitudes and sexual risk behaviors is not as strong or direct in this study sample as the program model had assumed. In particular, as part of additional exploratory analyses, we used data from the baseline and 6-month follow-up surveys to determine if youth gender attitudes at baseline predicted sexual risk behaviors at follow up. We conducted these analyses using data only for participants in the control group, to account for any possible correlation between treatment status and either gender attitudes or sexual risk behaviors. On the bases of these analyses, we found the expected associations between baseline attitudes about pregnancy, masculinity, and males' roles in sex and sexual behaviors and intentions 6 months later. These associations align with the program logic model and support prior research showing a link between youth gender attitudes and sexual risk behaviors. We found no evidence to support the hypothesis that a lack of correlation between youth gender attitudes and sexual risk behaviors may explain our mixed results.

Another possible explanation is a relative lack of variation in the particular gender attitudes measured for this study. Our findings suggest that youth in the study sample held relatively nontraditional (egalitarian) attitudes toward gender norms, even at baseline, which may explain, in part, the lack of evidence of program impacts on our gender attitude measures. In addition, as part of additional exploratory analyses not presented in the main report, we found little variation in youth gender attitudes across subgroups defined by gender or youth racial/ethnic background. However, the survey only measured highly traditional gender attitudes. Our evaluation may have found different results if the program and study had focused on more nuanced or malleable measures of gender norms on which sample members held more diverse attitudes. Alternatively,

the focus on traditional gender ideologies may also have increased the likelihood of socially desirable responses that may not reflect actual beliefs, a long-standing concern in measurement of gender attitudes (Chang 1999; Jean and Reynolds 1984). Both of these issues limit our ability to draw conclusions about the program's impacts on youth gender beliefs.

As discussed in the interim impact report, aspects of the evaluation setting may also have contributed to our mixed results (Smith et al. 2016). First, youth in Travis County faced significant barriers to accessing female birth control methods during the study period. Since 1998, Texas law has required that adolescents obtain parental consent to receive prescription birth control. Confidential contraceptive services that do not require parental consent are offered to youth in clinics that receive funding through the federal Title X Family Planning program. However, in 2013, many family planning clinics in Texas lost federal Title X funding, including a Planned Parenthood clinic in Austin, the most commonly used source of contraceptive services among Travis County youth until that point. The few family planning clinics in Travis County that have retained Title X funding and provide confidential contraceptive services are difficult for youth to access due to their limited hours and location. In this environment, it may have been difficult for the Gen.M program's impacts on knowledge of and attitudes toward female birth control to translate to changes in contraceptive behaviors during the study period.

Second, as discussed in Chapter II, a number of new pregnancy prevention programs were launched in Travis County just before and during the study period, which may have reduced the contrast between the treatment and control group conditions. Although the interim impact report present strong evidence suggesting the Gen.M program filled key gaps in the program landscape at the time of program delivery, a large majority of youth in the control group reported receiving information on several key sexual and reproductive health topics during the study period, including reproduction, STIs, and how to say no to sex (Smith et al. 2016). Consistent with this, a large share of youth in the control group reported strong attitudes against pregnancy, supportive attitudes toward consistent condom use, and high levels of confidence in their sexual refusal skills at baseline and at the 6-month follow up.

Third, youth in the study sample reported lower levels of sexual risk behaviors than were anticipated given the at-risk population targeted by the SYEP. For example, rates of sexual activity within the last three months for control group youth in the 18-month follow up were roughly 14 percentage points lower than the state average for youth of comparable age in 2013 (25 percent among control group youth compared to 39 percent among 11th grade students in Texas) (CDC 2013). One possible explanation for this is that the study targeted all SYEP applicants, including those not selected for the program. Another is that SYEP applicants are different from other youth living in Travis County in ways that affect their sexual behaviors. For example, the parents of youth who applied to the SYEP program, which requires extensive parental involvement in the application process, may differ from those of youth with similar characteristics who did not apply for the SYEP. It is possible that the program would have had different results among higher-risk youth.

As the above discussion suggests, and as is typical of evaluations of teen pregnancy prevention programs, the findings presented in this report may not generalize to populations or settings outside of our study sample. By design, the evaluation focused on a specific set of youth in Travis County who applied to the SYEP, who may differ from the broader population of youth

in Travis County and in other parts of the country. In addition, and as noted earlier, although the zip codes from which the SYEP draws its participants contain youth at high risk for teen pregnancy, the youth who apply to and participate in the SYEP within these zip codes may differ from those who do not in ways that affect sexual risk behaviors and mediating factors. Finally, of the SYEP applicants potentially eligible for the study, only about half were enrolled in the study, suggesting that our study sample may not be representative of all age-eligible youth who applied to the SYEP.

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APPENDIX A

NONRESPONSE ANALYSIS

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This appendix examines the characteristics of the study participants lost to follow up at the time of the 18-month follow-up survey. As reported in Chapter II, among the 823 youth who were randomly assigned to the treatment and control groups, 686 completed the 18-month survey, for an overall response rate of 83 percent. The remaining 137 participants did not complete an 18-month survey and were therefore excluded from the impact analyses presented in this report. Because nonresponse rates were low and respondents and nonrespondents were similar (as discussed below), we did not use nonresponse weights in our analysis of program impacts.

To better understand the characteristics of the study participants lost to follow up, we used data from the baseline survey to compare the samples of follow-up survey respondents and nonrespondents. We compared the groups on a total of 28 measures of sociodemographic characteristics, exposure to information, and sexual risk behaviors (Tables A.1 and A.2). On the basis of this comparison, we found only one statistically significant difference. Compared to the 686 youth included in the analysis, the 137 nonrespondents were significantly less likely to report receiving information on birth control methods in the past 12 months. Other differences between the groups at the time of the baseline survey were generally small and not statistically significant.

Table A.1. Baseline sociodemographic characteristics

Variable	Respondent mean	Nonrespondent mean	Difference	p-value
Age at random assignment (years)	15.4	15.4	0.0	0.74
Female (%)	50.6	41.6	9.0	0.08
Race/ethnicity (%)				
White, non-Hispanic	5.0	2.2	2.8	0.05
Black, non-Hispanic	56.4	54.0	2.4	0.29
Hispanic	35.4	41.6	-6.2	0.07
Other race/ethnicity or multiracial	3.2	2.2	1.0	0.74
Main language spoken at home not English (%)	5.4	5.1	0.3	0.82
Religion (%)				
Religion is very important in life	41.5	42.6	-1.1	0.86
Attend religious services/events weekly	38.2	34.8	3.4	0.33
Family structure (%)				
Lives with both biological parents	30.4	24.8	5.6	0.22
Lives with one biological parent	61.4	67.2	-5.8	0.29
Lives with neither biological parent	8.2	8.0	0.2	0.91
Parents' employment status (%)				
Mother is employed	85.9	81.3	4.6	0.21
Father is employed	84.0	87.9	-3.9	0.20
Relationship with parents (%)				
Feels very close to or cared for by mother	62.6	64.4	-1.8	0.72
Feels very close to or cared for by father	38.8	43.5	-4.7	0.29
Sample size^a	686	137		

Source: Baseline survey administered to study participants before the start of the program.

Notes: Reported means are from weighted regressions that account for the random assignment design. See Appendix B for a description of the measures.

^a Reported sample size does not account for item nonresponse for any measures included in the table.

Table A.2. Baseline exposure to information and risk behaviors

Variable	Respondent mean	Nonrespondent mean	Difference	p-value
In the past 12 months, received information on: (%)				
Relationships and dating	81.5	82.5	1.0	0.60
Abstinence	60.7	59.5	1.2	0.99
Methods of birth control	47.3	34.8	12.5*	0.04
Where to obtain birth control	40.0	37.4	2.6	0.97
Sexually transmitted infections	78.2	75.4	2.8	0.71
How to talk to partner about birth control	46.2	42.7	3.5	0.84
How to say no to sex	67.9	65.7	2.2	0.73
Reproduction	81.1	85.8	-4.7	0.11
Ever had sexual intercourse (%)	32.9	41.2	-8.3	0.11
In the past 3 months: (%)				
Had sexual intercourse	17.4	18.3	-0.9	0.76
Had unprotected sex	3.7	4.2	-0.5	0.56
Had sex without a condom	8.2	6.7	1.5	0.60
Sample Size^a	686	137		

Source: Baseline survey administered to study participants before the start of the program.

Notes: Reported means are from weighted regressions that account for the random assignment design. See Appendix B for a description of the measures.

^a Reported sample size does not account for item nonresponse for any measures included in the table.

*Significantly different from zero at the .05 level, two-tailed test.

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APPENDIX B

DATA AND MEASURES

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This appendix provides more detailed information on the survey data collection and measures. We begin by describing the survey design and administration. We then provide a more detailed description of how we constructed the outcome measures. We end by listing the baseline measures considered as candidate covariates for the regression models.

A. Survey design and administration

As discussed in Chapter III, the impact estimates presented in this report are based on survey data collected in a baseline survey administered before enrollment in the study and a follow-up survey about 18 months later. For the baseline survey, trained data collection staff from Mathematica administered a paper-and-pencil interviewing (PAPI) questionnaire to groups of youth. For the follow-up survey, trained Mathematica staff administered the surveys by telephone to individual youth.

The baseline and follow-up surveys followed a similar structure and were designed to capture a broad range of measures of family background and demographic characteristics, exposure to information, knowledge, attitudes, future intentions, and sexual activity. The surveys were developed by the PPA research team in coordination with EngenderHealth staff and Columbia University faculty. They drew on items found in well-established surveys such as the National Longitudinal Study of Adolescent Health, the National Longitudinal Survey of Youth, the Youth Risk Behavior Survey, and the National Survey of Family Growth. In some cases, we had to adapt questions to fit the PAPI mode for the baseline survey.

We designed the questionnaire so that sensitive items related to sexual activity were asked only of youth who reported being sexually experienced. Specifically, the survey was split into three parts. Part A asked all youth general questions about family background and demographic characteristics, knowledge, attitudes, and intentions. This part of the survey concluded with a single screening question about sexual experience: “Have you ever had sexual intercourse?” Youth who answered yes to this screening question were then asked questions in Part B1 of the survey, which contained more detailed questions regarding sexual risk behaviors. Youth who answered no to the screening question were asked questions in Part B2 of the survey, which included an alternative set of questions.

As with any self-reported survey, the responses can be subject to reporting bias, which can differ between the treatment and comparison groups. For this study, we were concerned primarily with sexual risk behaviors and attitudes and intentions that potentially mediate those behaviors. For these measures, reporting bias can occur in either direction. On the one hand, youth in the treatment group may be less likely to report support for or engagement in risky sexual behaviors because they are embarrassed to admit to a behavior the program discourages. Such underreporting could lead to a spurious finding of lower rates of sexual activity or higher rates of contraceptive use. On the other hand, the program might make youth in the treatment group better informed about sexual risk behaviors and therefore more likely to report their true attitudes or involvement in them. Such an effect could lead to a spurious finding of higher rates of sexual activity or lower rates of contraceptive use among youth in the treatment group.

We took steps to minimize these risks. To help encourage honest reporting, the 18-month follow-up survey was administered by independent data collectors trained and employed by Mathematica, not by EngenderHealth program staff or anyone else personally connected to the

study participants. In addition, for the 18-month survey, we had the telephone interviewers use a standardized script to administer the follow-up surveys to ensure both uniformity in the data collection procedures and objectivity in the question wording. The interviewers reminded participants that their answers would be kept confidential and encouraged them to respond truthfully to the questions.

B. Outcome measures

As discussed in Chapter III, we used data from the 18-month follow-up survey to construct seven groups of outcome measures: (1) knowledge of birth control methods and sources, (2) attitudes toward pregnancy and contraception, (3) attitudes toward gender roles, (4) intentions about sex and contraceptive use, (5) perceived refusal skills, (6) sexual activity, and (7) unprotected sex. In this section, we provide more detailed information on how we constructed these outcome measures.

1. Knowledge

The survey asked youth five questions about their knowledge of condoms, birth control pills, pregnancy, and STIs. Four questions focused on knowledge about the efficacy of birth control pills and condoms in preventing pregnancy and STIs, and the fifth question asked about perceived knowledge of where to access female birth control. Using these five questions, we constructed three measures: (1) knowledge of birth control pills (based on two questions), (2) knowledge of condoms (based on two questions), and (3) perceived knowledge of female birth control sources (based on one question). For the first two measures, we totaled the number of correct responses to two knowledge questions to create a summary index with a value range of 0 to 2 (Table B.1). For the third measure, we created a binary variable that equals one if youth responded that they would definitely know where to access female birth control methods and zero otherwise (Table B.1)

Table B.1. Questions used to construct knowledge outcomes

Question	Response categories
Knowledge of birth control pills	
If birth control pills are used correctly and consistently, how much can they reduce the risk of pregnancy?	Not at all, a little, a lot, completely, or don't know [correct response: a lot]
If birth control pills are used correctly and consistently, how much can they reduce the risk of getting HIV, the virus that causes AIDS?	Not at all, a little, a lot, completely, and don't know [correct response: not at all]
Knowledge of condoms	
If condoms are used correctly and consistently, how much can they reduce the risk of pregnancy?	Not at all, a little, a lot, completely, or don't know [correct response: a lot]
If condoms are used correctly and consistently, how much can they reduce the risk of getting HIV, the virus that causes AIDS?	Not at all, a little, a lot, completely, or don't know [correct response: a lot]
Perceived knowledge of female birth control sources	
How true do you think it is that you would know where to go for birth control methods like the pill or the shot for you or your partner?	Definitely true, probably true, probably false, definitely false, or don't know

3. Attitudes toward pregnancy and contraceptives

We constructed four measures of youth's attitudes toward pregnancy and contraceptive use: (1) attitudes toward pregnancy, (2) perceived importance of condom use for safe sex, (3) perceived need for consistent condom use, and (4) perceived need for consistent female birth control use.

For the measure of youth's **attitudes toward pregnancy**, the survey asked youth to respond to the following three questions or statements:

1. If you got pregnant now/got someone pregnant now, how would you feel?
2. Getting pregnant/getting a girl pregnant in the next year or two would hurt my chances of being successful in life.
3. If I got pregnant/got a girl pregnant in the next year or two my life would become a lot better.

For the first question, the possible response categories were very happy, a little happy, neither happy nor upset, a little upset, and very upset. For the second and third statements, the response categories were strongly agree, agree, disagree, and strongly disagree. The second item was reverse coded so that higher values on all three items represented greater disappointment with the idea of becoming pregnant or getting a girl pregnant. Given the different numbers of response categories for each item, we created a standardized scale, with higher values indicating stronger attitudes against becoming pregnant or getting a partner pregnant. A factor analysis confirmed that all three items load onto a single construct. The scale has moderate internal reliability (alpha coefficient = 0.61 for the full sample, 0.57 for females, and 0.65 for males at baseline; and 0.67 for control group youth, 0.68 for control group females, and 0.69 for control group males at the 18-month follow up).

For the **perceived importance of condom use for safe sex** measure, the survey asked youth whether they agreed or disagreed with the following statement: "Condoms are important to make sex safer." The five response categories were strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. We constructed an indicator variable for whether youth strongly agreed with the statement.

For the measure of **perceived need for consistent condom use**, the survey asked youth whether they agreed or disagreed with the following statement: "Condoms should always be used if a person your age has sexual intercourse." The five response categories were strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. We constructed an indicator variable for whether youth strongly agreed with the statement.

For the measure of **perceived need for consistent female birth control use**, the survey asked youth whether they agreed or disagreed with the following statement: "Birth control should always be used if a person your age has sexual intercourse." The five response categories were strongly agree, agree, neither agree nor disagree, disagree, and strongly disagree. We constructed an indicator variable for whether youth strongly agreed with the statement.

4. Attitudes toward gender roles

We constructed four measures of gender role attitudes: (1) beliefs about masculinity, (2) beliefs about males' role in sex, (3) beliefs about females' obligation to have sex, and (4) beliefs about the importance of boyfriends to girls' self-esteem (female youth only).

For the measure of youth's **beliefs about masculinity**, the survey asked youth whether they agree or disagree with the following four statements:

1. The best way for a boy to show he is strong is to act tough.
2. In a good dating relationship, the boy gets his way most of the time.
3. It's embarrassing for a boy when he needs to ask for help.
4. If a girl and a boy have sex, the girl is more responsible for preventing pregnancy than the boy.

The four response categories were strongly agree, agree, disagree, and strongly disagree. We created a scale with a value range of 1 to 4 by averaging responses across the four items. Higher values indicate less traditional attitudes toward masculinity. A factor analysis confirmed that all four items load onto a single construct. The scale has marginal internal reliability (alpha coefficient = 0.52 for the full sample, 0.50 for females, and 0.50 for males at baseline; and 0.64 for the full sample and male and female youth at the 18-month follow up).

For the measure of youth's **beliefs about males' role in sex**, the survey asked youth whether they agree or disagree with the following six statements:

1. It is embarrassing for a 16-year-old boy if he has never had sexual intercourse.
2. It is alright for a boy to pressure a girl to have sex if she has had sex with him in the past.
3. When a girl says no to sex, she expects the boy to keep trying.
4. One way for a guy to prove he is a real man is to have sex with a lot of girls.
5. A guy should have sexual intercourse as early as he can in his life.
6. It is alright for a boy to pressure a girl to start having sex if they have been dating for nine months.

The four response categories were strongly agree, agree, disagree, and strongly disagree. We created a scale with a value range of 1 to 4 by averaging responses across the six items. Higher values indicate less traditional attitudes toward males' role in sex. A factor analysis confirmed that all six items load onto a single construct. The scale has high internal reliability (alpha coefficient = 0.80 for the full sample, 0.75 for females, and 0.79 for males at baseline; and 0.81 for the full sample of control group youth, and 0.76 and 0.84 for females and male control group youth, respectively, at the 18-month follow up).

For the measure of **beliefs about females' obligation to have sex**, the survey asked youth whether they agreed or disagreed with the following statement: "A girl who really likes a guy needs to have sex with him to prevent him from finding someone else." The four response

categories were strongly agree, agree, disagree, and strongly disagree. Based on responses to this question, we created a continuous variable ranging from 1 to 4, with higher values indicating greater disagreement and less traditional attitudes.

For the measure of youth's **beliefs about the importance of boyfriends to girls' self-esteem**, the survey asked female youth whether they agreed or disagreed with the following three statements:

1. Teenage girls who have a boyfriend feel better about themselves than girls who don't have a boyfriend.
2. When a teenage girl has a boyfriend, other girls look up to her.
3. A girl is likely to feel bad about herself if she never has a boyfriend.

The four response categories were strongly agree, agree, disagree, and strongly disagree. We created a scale with a value range of 1 to 4 by averaging responses across the six items. Higher values indicate greater disagreement with statements that link having a boyfriend to a girl's self-esteem. A factor analysis confirmed that all three items load onto a single construct. The scale has moderate internal reliability (alpha coefficient = 0.67 for the full female sample at baseline and 0.79 for female control group youth at the 18-month follow up).

5. Intentions toward sex and contraceptive use

The survey included the following three questions about youth's intentions toward sexual activity and contraceptive use:

1. Do you intend to have sexual intercourse in the next year, if you have the chance?
2. If you were to have sexual intercourse in the next year, do you intend to use or have your partner use a condom?
3. If you were to have sexual intercourse in the next year, do you intend to use (or have your partner use) any of these other methods of birth control? Birth control pills, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), implants (Implanon)

The response categories for all three questions were yes, definitely; yes, probably; no, probably not; and no, definitely not. For each question, we constructed a binary measure comparing youth who responded yes, definitely to youth who responded in any of the other three categories. For each question, youth who did not respond to the question were coded as missing. Based on questions 2 and 3 above, we also constructed a fourth composite binary measure of whether youth reported an intention to use a condom or female birth control method if they have sexual intercourse in the next year. We estimated impacts of the Gen.M program separately for each measure.

6. Refusal skills

To measure sexual refusal skills, we constructed two versions of composite measure of perceived refusal skills, one for male youth and one for female youth. The measure for male youth is based on two questions asked of both male and female youth. The measure for female youth is based on those same two questions and one additional question asked of female youth

only (as part of the same series of questions). All three questions were prefaced with the following instruction: “For these questions, imagine you are alone with someone you liked very much.” The survey then asked male and female youth the following questions:

1. How likely is it that you could stop them if they wanted to touch your private parts below the waist, meaning the parts of the body covered by underwear, and you did not want them to do that?
2. How likely is it that you could avoid having sexual intercourse if you didn’t want to?

The survey also asked female youth only the following question:

3. “How likely is it that you could stop them if they wanted to touch your chest and you did not want them to do that?”

The response categories for all three questions were not at all likely, a little bit likely, somewhat likely, and very likely. For male youth, we averaged responses across the first two questions to create a summary index with values ranging from 1 to 4. For female youth, we averaged responses across the three items to create a scale ranging from 1 to 4. A factor analysis of the female youth scale confirmed that the items load strongly onto a single construct, and the scale has high to moderate internal reliability (alpha coefficient = 0.80 at baseline and 0.64 among control group youth at the 18-month follow up).

7. Sexual activity

As discussed in Chapter III, we constructed two variables that capture whether or not youth were sexually active at the time of the 18-month follow up: (1) a binary (yes/no) indicator for whether youth reported ever having had sex and (2) a binary indicator for whether youth reported having had sex in the past three months. Below, we provide more detail on how we constructed each measure and the decision rules used to resolve inconsistent or missing responses.

Ever had sexual intercourse. Coding for this measure was done in two steps. First, youth were assigned a value based on the screening question (“have you ever had sexual intercourse”) at the end of Part A of the 18-month follow-up survey. Second, we looked at possible inconsistencies between the 18-month follow-up and baseline surveys with respect to sexual activity. There are 32 youths who reported being sexually active at baseline but who reported not having had sex at the 18-month follow up. There are two additional cases that reported being sexually active at baseline but did not answer the question about sexual activity at follow up. All of these cases were re-coded to reflect the sexually active status at baseline.

Had sexual intercourse in the past three months. This binary variable was coded in a stepwise fashion from a series of sexual behavior questions. First, youth who had never had sexual intercourse or for whom lifetime sexual experience could not be determined (based on the variable described above) were coded as not having had sexual intercourse in the past three months or as missing values, respectively. Second, for respondents who had some lifetime experience with sexual intercourse, we proceeded as follows:

- **Youth who reported having had sexual intercourse once.** The survey asked these youth, “Have you had sexual intercourse more than one time?” Youth who replied no were then

asked, “When you had sexual intercourse, what month and year was it?” This question was used to determine the number of months between follow-up survey administration and date of first sex for respondents who had only had sexual intercourse one time. If the number of months was three or less, youth were coded as having had sexual intercourse in the past three months. If the date of first sex was missing, we coded the cases as missing values.

- **Youth who reported having had sexual intercourse more than once.** For these youth, the survey later asked, “Now please think about the past 3 months. In the past 3 months, how many TIMES have you had sexual intercourse?” If youth responded with a number of one or greater, they were coded as having had sexual intercourse in the past three months. If the information on the number of times that youth had sexual intercourse in the past three months was missing, we used responses to a question that asked them the date of *most recent* sexual intercourse to determine whether they had had sexual intercourse in the past three months. In the few cases in which this information was also missing, we coded the cases as missing values.

8. Unprotected sex

As discussed in Chapter III, the survey included different sets of questions about use of contraception during sexual intercourse for youth who reported having sexual intercourse only once and youth who reported having sexual intercourse more than once. For those who reported having sexual intercourse once, the survey asked the following two questions about contraceptive use:

1. “Birth control methods are something used to reduce the risk of pregnancy, and some can reduce the risk of sexually transmitted diseases, also known as STIs. When you had sexual intercourse, did you or your partner use any type of birth control—including condoms or any other method?”
2. Respondents who replied yes to that question were then asked a series of questions about specific methods of birth control using the following question stem: “When you had sexual intercourse, did you or your partner use ... ?” The specific methods asked about were: (a) condoms, (b) birth control pills or the patch, (c) Depo-Provera or other injectable birth control, (d) withdrawal or pulling out, (e) another method (for which responses were back-coded to capture respondents who had used a modern birth control method).

Among respondents who reported having had sex more than once in their lifetime, only youth who reported having sexual intercourse in the past three months were asked the following two questions about contraceptive use:

1. “In the past 3 months, how many TIMES have you had sexual intercourse without using a condom?”
2. “The next question is about your use of the following methods of birth control: condoms, birth control pills, the shot of Depo-Provera, the patch, the ring or NuvaRing, IUS or Mirena or Paraguard, implants or Implanon. In the past 3 months, how many TIMES have you had sexual intercourse without using any of these methods of birth control?”

Based on responses to these two sets of questions, we created two binary (yes/no) indicators for whether a participant reported having (1) unprotected sex in the past three months, defined as having sexual intercourse in the past three months without any modern contraceptive method (including condoms or a modern female contraceptive method), and (2) having sex without a condom. Youth who did not have sexual intercourse in the past three months were coded as not having unprotected sex (and not having sex without a condom). Youth who did not respond to the questions about contraceptive use in the past three months were coded as missing values.

C. Baseline measures considered as candidate covariates

As discussed in Chapter III, to improve the precision of the impact estimates, we used a data-driven stepwise selection process to identify baseline covariates that are strongly correlated with our outcome measures. Including such covariates can help improve the precision of the impact estimates by reducing the amount of residual variation in the outcome measures. Table B.2 lists all the candidate covariates we considered for the impact models. This list includes variables for which the observed difference between the treatment and control groups had a p -value of 0.20 or less and variables shown in the literature to be correlated with sexual risk behaviors.

For the selection of covariates for the impact models, we used stepwise regression methods to identify candidate covariates with significant explanatory power in regression models for the sexual behavior outcomes. The stepwise regression models for all outcomes included a core, fixed set of covariates, which included key demographic variables highly correlated with the outcomes of interest (age, gender, and race/ethnicity) and a baseline measure of the outcome variable (where applicable). Additional candidate covariates were selected using the stepwise selection procedure. At each step of the stepwise procedure, the variable with the smallest p -value below a preset threshold level was included in the model while variables already selected were evaluated to see if any could be removed; the variable with a p -value greater than the critical value of 0.32 and whose removal would least lower the adjusted R^2 was removed. The critical p -value was set at 0.32 to correspond to a t -statistic of 1, which is the smallest value of the t -statistic at which the addition of a variable in the model increases the adjusted R^2 value.

To identify a common set of covariates to use in all of the final impact models, we compared the covariates selected by the stepwise regression procedure for each sexual behavior outcome. Along with the core set of covariates included in all models (age, gender, race/ethnicity, and the baseline outcome measure [if applicable]), a variable was included in the final covariate set if (1) there was a statistically significant treatment-control group baseline difference in the variable and it was selected in the final stepwise model for at least one of the sexual behavior outcomes or (2) there was no treatment-control group difference at baseline, but the variable was selected by the stepwise regressions for about 60 percent or more of the sexual behavior outcomes. The results of the selection procedure identified four variables to include in the benchmark impact models, in addition to the core covariate set. These were measures of (1) attitudes towards pregnancy, (2) beliefs about a male's role in sex, (3) intentions to have sexual intercourse, and (4) whether the individual ever had sex.

Table B.2. Measures of baseline sample characteristics

Measure	Definition
Sociodemographic characteristics	
Age at random assignment	Continuous variable based on date of birth and date of baseline questionnaire administration.
Female	Binary variable: equals 1 if participant reported being female and 0 if participant reported being male.
Race/ethnicity	Categorical variable with categories for (1) Hispanic, (2) non-Hispanic white, (3) non-Hispanic black, and (4) non-Hispanic “other” or multiple race.
Main language spoken at home not English	Binary variable: equals 1 if participant reported primarily speaking a language other than English at home; equals 0 if participant reported speaking primarily English at home.
Importance of religion	Binary variable: equals 1 if participant reported that religion is very important in her life; equals 0 if participant reported religion is somewhat important or not at all important.
Religious attendance	Binary variable: equals 1 if participant reported attending religious services once per week or more often; equals 0 if participant reported attending religious services less than once per week.
Family structure	Categorical variable with categories for (1) lives with both biological parents in same household, (2) lives with exactly one biological parent, (3) lives with neither biological parent.
Mother’s employment status	Binary variable: equals 1 if participant reported that mother is working at a part-time or full-time job; equals 0 if participant reported that mother is not working at a paid job.
Father’s employment status	Binary variable: equals 1 if participant reported that father is working at a part-time or full-time job; equals 0 if participant reported that father is not working at a paid job.
Relationship quality with mother	Binary variable: equals 1 if participant reported that mother both cares very much about and is very close to the participant; equals 0 if the participant reported a lower level of caring or closeness.
Relationship quality with father	Binary variable: equals 1 if participant reported that father both cares very much about and is very close to the participant; equals 0 if the participant reported a lower level of caring or closeness.
Exposure to information on sexual and reproductive health topics	
Received information on relationships and dating	Binary variable: equals 1 if participant received any information in the past 12 months on relationships, dating, marriage, or family life; equals 0 if participant did not receive this information.
Received information on abstinence	Binary variable: equals 1 if participant received any information in the past 12 months on abstaining from sex; equals 0 if participant did not receive this information.
Received information on methods of birth control	Binary variable: equals 1 if participant received any information in the past 12 months on methods of birth control; equals 0 if participant did not receive this information.
Received information on where to obtain birth control	Binary variable: equals 1 if participant received any information in the past 12 months on where to get birth control; equals 0 if participant did not receive this information.
Received information on sexually transmitted infections	Binary variable: equals 1 if participant received any information in the past 12 months on STIs; equals 0 if participant did not receive this information.
Received information on how to talk to partner about birth control	Binary variable: equals 1 if participant received any information in the past 12 months on how to talk to partner about whether to have sex or use birth control; equals 0 if participant did not receive this information.
Received information on how to say no to sex	Binary variable: equals 1 if participant received any information in the past 12 months on how to say no to sex; equals 0 if participant did not receive this information.
Received information on reproduction	Binary variable: equals 1 if participant received any information in the past 12 months on how babies are made; equals 0 if participant did not receive this information.

Measure	Definition
Knowledge of birth control methods and sources	
Knowledge of birth control pills	Index variable: sum of correct responses to two survey questions; variable ranges from 0 to 2, with higher values indicating greater knowledge.
Knowledge of condoms	Index variable: sum of correct responses to two survey questions; variable ranges from 0 to 2, with higher values indicating greater knowledge.
Perceived knowledge of female birth control sources	Binary variable: equals 1 if youth report that they definitely know where to obtain birth control; equals 0 if youth report a lower level of perceived knowledge.
Attitudes toward pregnancy and contraception	
Attitudes toward pregnancy	Continuous scale variable: standardized scale based on four survey questions; variable ranges from -2.6 to 0.9, with higher values indicating stronger attitudes against becoming pregnant or getting a partner pregnant.
Perceived importance of condom use for safe sex	Binary variable: equals 1 if youth reported that they strongly agree that condoms are important to make sex safer; equals 0 if youth did not strongly agree.
Perceived need for consistent condom use	Binary variable: equals 1 if youth reported that they strongly agree that condoms should always be used if a person their age has sexual intercourse; equals 0 if youth did not strongly agree.
Perceived need for consistent female birth control use	Binary variable: equals 1 if youth reported that they strongly agree that birth control should always be used if a person their age has sexual intercourse; equals 0 if youth did not strongly agree.
Intentions about sex and contraceptive use	
Intentions to have sexual intercourse	Binary variable: equals 1 if youth reported that they definitely intended to have sexual intercourse in the next year; equals 0 if youth reported less intention.
Intentions to use a female method of birth control	Binary variable: equals 1 if youth reported that they definitely intended to use a female birth control method during sexual intercourse in the next year; equals 0 if youth reported less intention.
Intentions to use condoms	Binary variable: equals 1 if youth reported that they definitely intended to use a condom during sexual intercourse in the next year; equals 0 if youth reported less intention.
Intentions to use a female birth control or condoms	Binary variable: equals 1 if youth reported that they definitely intended to use a female birth control method or condom during sexual intercourse in the next year; equals 0 if youth reported less intention.
Attitudes toward gender roles	
Beliefs about masculinity	Continuous scale variable: average of responses to four survey questions; variable ranges from 1 to 4, with higher values indicating less traditional views.
Beliefs about males' role in sex	Continuous scale variable: average of responses to six survey questions; variable ranges from 1 to 4, with higher values indicating less traditional views.
Beliefs about females' obligation to have sex	Based on a single survey question: variable ranges from 1 to 4, with higher values indicating less traditional views.
Perceived refusal skills	
Perceived refusal skills	Average of two (male youth) or three (female youth) survey questions; variable ranges from 1 to 4, with higher values indicating a greater perceived refusal skills.

APPENDIX C

SENSITIVITY ANALYSIS

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The main impact findings presented in Chapter IV of this report are derived from a particular set of analytic decisions, ranging from the data-cleaning procedures used to construct the outcome measures to the specification of the regression models. We made these decisions in accordance with established research standards and the particular features of our study design. However, we also investigated the sensitivity of our results to alternative analytic decisions. In this appendix, we present findings from three types of sensitivity tests. First, we examine the sensitivity of our results to alternative data-cleaning procedures for the measures of sexual risk behavior. Then, we then examine the sensitivity of our results to the specification of the regression models used to estimate program impacts. Finally, we end by discussing the sensitivity of our results to the adjustment for multiple hypothesis testing.

A. Data-cleaning procedures

As described in Appendix B, our analysis of the self-reported survey data uncovered some inconsistent or discrepant responses to the questions on sexual risk behaviors. For the main impact findings presented in this report, we accounted for these discrepancies when creating our outcome measures by considering the preponderance of evidence across all relevant questions in the survey (see Appendix B for a more detailed description). However, we also examined the sensitivity of our results to three alternative methods for cleaning the data:

1. Coding a respondent as having engaged in a specific behavior if *any* survey item indicates he or she did so.
2. Coding a respondent as *not* having engaged in a specific behavior if any survey item indicates he or she did *not* do so.
3. Dropping a respondent from the analysis if the survey items show a pattern of inconsistent responses.

The results of these analyses showed that our findings are robust to alternative data-cleaning procedures (Table C.1). For the measure of ever having had sex, the reported impact estimates range from a decrease of 1.9 percentage points to an increase of 1.0 percentage points. For the measure of having had sexual intercourse in the prior three months, the reported impact estimates range from -2.7 to -1.2 percentage points. For the measure of unprotected sex, the reported impact estimates show differences in rates of unprotected sex ranging from -1.4 to -0.8 percentage points. Finally, for the measure of having sexual intercourse without a condom, the impact estimates range from a decrease of 1.1 percentage points to an increase of 0.6 percentage points. None of these estimates are statistically significant.

Table C.1. Sensitivity of impacts to data-cleaning procedures

Outcome	Primary method			Alternative method 1			Alternative method 2			Alternative method 3		
	Control group mean	Diff.	p-value	Control group mean	Diff.	p-value	Control group mean	Diff.	p-value	Control group mean	Diff.	p-value
Sexual activity (%)												
Ever had sexual intercourse	48.4	1.0	>0.99	48.4	1.0	>0.99	42.3	-1.9	>0.99	44.9	-0.9	>0.99
Had sexual intercourse in the past 3 months	25.0	-2.7	0.69	25.6	-2.4	0.76	7.4	-1.2	>0.99	8.9	-1.8	>0.99
Unprotected sex (%)												
Had unprotected sex in the past 3 months	9.0	-1.2	>0.99	9.4	-0.8	>0.99	3.9	-1.1	>0.99	4.0	-1.4	>0.50 ^a
Had sex without a condom in the past 3 months	10.2	-0.1	>0.99	10.5	-0.1	>0.99	3.3	0.6	>0.99	4.0	-1.1	>0.66 ^a

Source: Youth surveys administered by the study team.

Note: For each outcome, the numbers in the columns labeled control group mean are regression-adjusted predicted values of the outcomes at the 18-month follow-up survey. The numbers in the columns labeled Diff." indicate the regression-adjusted average difference in outcomes between the treatment and control groups at the 18-month follow-up survey. All regressions are weighted to account for the random assignment design. Reported p-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the measures and analytic methods.

p-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a description of the outcome measures and analytic methods.

^aExact p-values not available due to instability of estimated variance-covariance matrix.

B. Alternative specification of regression models

As discussed in Chapter III, we specified our regression models to include the following covariates: a binary indicator for treatment status, three key demographic variables that are highly correlated with our key outcomes of interest (age, gender, and race/ethnicity), a baseline measure of the outcome (if applicable), and additional baseline covariates empirically selected through a data-driven forward selection procedure developed previously in the literature (Social and Character Development Research Consortium 2010). To examine the sensitivity of our results to alternative combinations of covariates, we estimated comparable regression models when (1) including only the treatment status indicator and baseline outcome measure and (2) excluding all covariates except the treatment status indicator (Table C.2). For all but one outcome, using the alternative combinations of control variables did not change the direction, general magnitude, or statistical significance of the reported impact estimates. The one exception is the estimated impact of Gen.M on knowledge of condoms. When estimated with no covariates, the impact on this outcome is no longer statistically significant at the 5 percent level ($p = 0.07$).

Table C.2. Sensitivity of impacts to specification of covariates

Outcome	Main findings			Controls for Baseline outcome measures only			No covariates		
	Diff.	p-value	R ²	Diff.	p-value	R ²	Diff.	p-value	R ²
Mediating outcomes									
Knowledge of birth control methods and sources									
Knowledge of birth control pills	0.1	<0.01**	0.18	0.1	0.01**	0.16	0.0	0.01**	0.00
Knowledge of condoms	0.1	0.02*	0.12	0.1	0.02*	0.10	0.1	0.07	0.01
Perceived knowledge of female birth control sources	12.4	<0.01**	0.11	12.9	<0.01**	0.08	12.3	<0.01**	0.02
Attitudes toward pregnancy and contraception									
Views on pregnancy	0.05	>0.99	0.23	0.0	>0.99	0.20	0.0	>0.99	0.00
Percentage of youth who strongly agree that:									
Condoms are important to make sex safer	6.0	0.41	0.07	5.1	0.67	0.05	6.2	0.43	0.00
Condoms should always be used by someone their age during sexual intercourse	2.7	>0.99	0.04	1.7	>0.99	0.02	1.8	>0.99	0.00
Female birth control should always be used if someone their age is having sexual intercourse	11.4	0.01**	0.06	10.3	0.03*	0.04	11.0	0.02*	0.01
Attitudes toward gender roles									
Beliefs about masculinity	0.1	>0.99	0.15	0.1	>0.99	0.14	0.1	>0.99	0.00
Beliefs about males' role in sex	0.1	0.08	0.20	0.1	0.09	0.17	0.1	0.13	0.01
Beliefs about females' obligation to have sex	0.1	0.45	0.16	0.1	0.61	0.10	0.1	0.49	0.00
Intentions about sex and contraceptive use									
Intentions to not have sexual intercourse in the next year	0.3	>0.99	0.20	0.6	>0.99	0.14	0.4	>0.99	0.00
Intentions to use a female birth control method or condoms if have sexual intercourse in the next year	5.3	0.13	0.10	4.8	0.21	0.04	5.3	0.13	0.01
Intentions to use condoms if have sexual intercourse in the next year	6.1	0.11	0.09	5.4	0.20	0.05	6.1	0.12	0.01
Intentions to use a female method of birth control if have sexual intercourse in the next year	6.5	0.35	0.06	7.2	0.26	0.02	8.1	0.16	0.00
Perceived refusal skills									
Perceived refusal skills	0.0	0.30	0.21	0.0	0.26	0.13	0.0	0.43	0.00
Sexual behavior outcomes									
Ever had sexual intercourse	-1.0	>0.99	0.15	n.a.	n.a.	n.a.	-0.1	>0.99	0.00
Had sexual intercourse in the past 3 months	2.7	0.69	0.24	2.5	0.90	0.15	3.2	0.75	0.00
Had unprotected sex in the past 3 months	1.2	>0.99	0.15	0.9	>0.99	0.04	0.7	>0.99	0.00
Had sex without a condom in the past 3 months	0.1	>0.99	0.19	0.5	>0.99	0.10	0.3	>0.99	0.00

Source: Youth surveys administered by the study team.

Note: For each outcome, the numbers in the columns labeled Diff. indicate the regression-adjusted average difference in outcomes between the treatment and control groups at the 18-month follow-up survey. All regressions are weighted to account for the random assignment design. Reported p-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the measures and analytic methods.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

C. Adjustment for multiple hypothesis testing

For the main findings presented in Chapter IV, we adjusted the statistical significance tests (p -values) to account for multiple hypothesis testing. As described in Chapter III, our analysis used multiple outcomes to answer some of the key research questions. For example, we constructed three separate measures of knowledge and four of intentions. Unless we account for this multiplicity, it could increase the chances of making a false discovery and lead to spurious claims about the program's effectiveness. To account for this feature, we adjusted our p -values to correct for multiple hypothesis testing within each outcome domain, using a procedure outlined by Hothorn et al. (2008) and Schochet (2009).

To examine the sensitivity of our results to this adjustment, we estimated comparable regression models without adjusting for multiple hypothesis testing. The adjusted and unadjusted p -values are reported in Table C.3. Using the unadjusted p -values changes the reported statistical significance of the impacts on three outcomes: (1) beliefs about a male's role in sex, (2) intentions to use a female birth control method or condoms, and (3) intentions to use condoms. For these outcomes, the reported impact estimates reach statistical significance at the 5 percent level when not adjusting for multiple hypothesis testing.

Table C.3. Sensitivity of impacts to adjustment for multiple hypothesis testing

Outcome	Control group mean	Diff.	Adjusted <i>p</i> -value (adjusted for multiple comparisons)	Unadjusted <i>p</i> -value (ignoring multiple comparisons)
Mediating outcomes				
Knowledge of birth control methods and sources				
Knowledge of birth control pills	1.0	0.1	<0.01**	<0.01**
Knowledge of condoms	0.9	0.1	0.02*	<0.01**
Perceived knowledge of female birth control sources	22.3	12.4	<0.01**	<0.01**
Attitudes toward pregnancy and contraception				
Views on pregnancy	-0.01	0.05	>0.99	0.35
Percentage of youth who strongly agree that:				
Condoms are important to make sex safer	59.3	6.0	0.41	0.10
Condoms should always be used by someone their age during sexual intercourse	72.1	2.7	>0.99	0.43
Female birth control should always be used if someone their age is having sexual intercourse	35.9	11.4	0.01**	<0.01**
Attitudes toward gender roles				
Beliefs about masculinity	3.2	0.1	>0.99	0.68
Beliefs about males' role in sex	3.4	0.1	0.08	0.02*
Beliefs about females' obligation to have sex	3.5	0.1	0.45	0.12
Intentions about sex and contraceptive use				
Intentions to have sexual intercourse	22.2	0.3	>0.99	0.92
Intentions to use a female birth control method or condoms	86.2	5.3	0.13	<0.01**
Intentions to use condoms	81.9	6.1	0.11	0.03*
Intentions to use a female method of birth control	49.7	6.5	0.35	0.09
Perceived refusal skills				
Perceived refusal skills	3.6	0.0	0.30	0.30
Sexual behavior outcomes				
Ever had sexual intercourse	48.4	-1.0	>0.99	0.78
Had sexual intercourse in the past 3 months	25.0	2.7	0.69	0.39
Had unprotected sex in the past 3 months	9.0	1.2	>0.99	0.63
Had sex without a condom in the past 3 months	10.2	0.1	>0.99	0.97

Source: Youth surveys administered by the study team.

Note: For each outcome, the numbers in the columns labeled Control group mean are regression-adjusted predicted values of the outcomes at the 18-month follow-up survey. The numbers in the columns labeled Diff. indicate the regression-adjusted average difference in outcomes between the treatment and control groups at the 18-month follow-up survey. All regressions are weighted to account for the random assignment design. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the measures and analytic methods.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

APPENDIX D

SUBGROUP ANALYSES

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As discussed in Chapter II, due to the Gen.M program's gender focus, we also conducted exploratory analyses to examine program impacts on subsamples of male and female youth (Table D.1). Because the study was not powered to detect program impacts for male and female youth separately, the subgroup results should be interpreted with caution; the smaller sample sizes for the subgroup analysis reduce our ability to precisely detect smaller differences in outcomes between the treatment and control groups.

The results were generally similar for males and females and the subgroup analysis reveals largely the same pattern of results as the full sample analysis presented in Chapter IV. As in our main analysis, there were no significant impacts of Gen.M on attitudes toward gender roles, intentions toward sex and contraceptive use, perceived refusal skills, sexual activity, or unprotected sex for either subgroup. However, results differed slightly by gender subgroup for outcomes in the domains of knowledge and attitudes toward pregnancy and contraceptive use.

The subgroup analysis suggest that the full sample impacts of Gen.M on knowledge of birth control pills and condoms are driven by increases in knowledge among female youth. Within the full sample, youth in the treatment group scored 0.1 points higher than youth in the control group on indexes measuring knowledge of birth control pills and condoms (whose values range from 0 to 2). However, this aggregate effect masks some heterogeneity. Male youth in the treatment group did not score significantly higher than their control group counterparts on either knowledge index. In contrast, female youth in the treatment group scored significantly higher than those in the control group on both knowledge indexes. Impacts of Gen.M on perceived knowledge of where to obtain female birth control methods were similar within the samples of male and female youth.

Program impacts on attitudes toward female birth control are qualitatively similar for male and female youth, but only significant for the male subsample. In the full sample analysis, Gen.M youth were 11.4 percentage points more likely than control group youth to strongly agree that female birth control should always be used if someone their age is having sexual intercourse. The difference for male youth is 14.0 percentage points and statistically significant; the difference for female youth is 9.7 percentage points, which is still sizable, but not statistically significant.

Table D.1. Impacts on male and female youth

Measure	Male youth				Female youth			
	Treatment group	Control group	Diff.	p-value	Treatment group	Control group	Diff.	p-value
Knowledge of birth control methods and sources								
Knowledge of birth control pills	1.0	0.9	0.1	0.34	1.3	1.1	0.2*	0.01
Knowledge of condoms	1.0	1.0	0.0	>0.99	1.0	0.8	0.2*	0.02
Percentage of youth reporting they definitely know where to obtain female birth control methods	24.4	12.8	11.6*	0.02	44.8	31.5	13.3*	0.03
Attitudes toward pregnancy and contraceptives								
Views on pregnancy	-0.1	-0.1	0.0	>0.99	0.2	0.0	0.2	0.54
Percentage of youth who strongly agree that:								
Condoms are important to make sex safer	66.1	61.7	4.4	>0.99	64.2	57.3	6.9	0.76
Condoms should always be used by someone their age during sexual intercourse	75.2	70.5	4.7	>0.99	74.0	73.5	0.5	>0.99
Female birth control should always be used if someone their age is having sexual intercourse	43.9	29.9	14.0*	0.03	50.9	41.2	9.7	0.28
Attitudes toward gender roles								
Beliefs about:								
Male gender roles	3.2	3.2	0.0	>0.99	3.3	3.3	0.0	>0.99
Males' role in sex	3.4	3.4	0.0	0.20	3.6	3.5	0.1	0.89
Females' obligation to have sex	3.4	3.4	0.0	0.83	3.7	3.7	0.0	>0.99
Importance of boyfriends to girls' self-esteem ^a	n.a.	n.a.	n.a.	n.a.	2.8	2.7	0.1	>0.99
Intentions toward sex and contraceptive use								
Percentage of youth reporting they will definitely:								
Not have sexual intercourse in the next year	15.7	12.5	3.2	>0.99	29.7	30.9	-1.2	>0.99
Use a condom or female birth control method if they have sexual intercourse in the next year	87.6	81.9	5.7	0.72	95.1	90.7	4.4	0.59
Use a condom if they have sexual intercourse in the next year	85.0	76.9	8.1	0.27	90.4	87.3	3.1	>0.99
Use a female birth control method if they have sexual intercourse in the next year	49.9	38.4	11.5	0.14	62.5	60.7	1.8	>0.99
Perceived refusal skills								
Perceived refusal skills	3.4	3.3	0.1	0.28	3.9	3.9	0.0	>0.99
Sexual activity								
Ever had sexual intercourse	50.3	56.9	-6.6	0.44	44.9	40.1	4.8	0.68
Had sexual intercourse in the past 3 months	27.5	31.1	-3.6	>0.99	27.8	19.3	8.5	0.12
Unprotected sex								
Had unprotected sex in the past 3 months	12.0	14.6	-2.6	>0.99	10.1	7.1	3.0	0.68
Had sex without a condom in the past 3 months	12.7	15.4	-2.7	>0.99	9.8	8.2	1.6	>0.99

Source: Youth surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled treatment group and control group are regression-adjusted predicted values of outcomes at the 18-month post-test survey. All regressions are weighted to account for the random assignment design. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the measures and analytic methods.

^a Measured for female youth only.

*Significantly different from zero at the .05 level, two-tailed test.

**Significantly different from zero at the .01 level, two-tailed test.

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