Evaluation of Adolescent Pregnancy Prevention Approaches

OAH Evaluation Report

Impact Report from the Evaluation of Adolescent Pregnancy Prevention Approaches

Final Impacts of the AIM 4 Teen Moms Program

February 2017

DEPARTMENT OF HEALTH & HUMAN SERVICES · USA

OFFICE OF ADOLESCENT HEALTH

Purpose statement: This study reports final findings from a large-scale demonstration project and evaluation of AIM 4 Teen Moms, a positive youth development program designed to increase contraceptive use and reduce the risk of repeat pregnancy among new teen mothers. The study reports final impacts of the program on repeat pregnancy, contraceptive use behaviors, and rates of unprotected sex measured about two years after the mother had enrolled in the study.

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CONTENTS

I. INTRODUCTION

This report presents final impact findings from a large-scale demonstration project and evaluation of the *AIM (Adult Identity Mentoring) 4 Teen Moms* program, a positive youth development program designed to increase contraceptive use and reduce the risk of repeat pregnancy among new teen mothers. The United States has seen significant declines in teen birth rates in recent years, yet teen mothers still accounted for about 230,000 live births in 2015 (Hamilton et al. 2016). Of these, nearly one in five was a repeat pregnancy—particularly common among adolescents as a result of a combination of biological factors and inconsistent or ineffective contraceptive use (Baldwin 2013). Further, research suggests that teen mothers are at risk of having a repeat pregnancy because they are more likely to act relative to the present, making it difficult for them to perceive long-term outcomes of risk behavior based on individual judgment alone (Cauffman and Steinberg 2000). To support healthy birth spacing, *AIM 4 Teen Moms* helps teen mothers define specific life aspirations, engage in planning to successfully achieve them, and consider the role of contraception in their lives (Clark et al. 2015).

In an earlier report, we found that *AIM 4 Teen Moms* had a favorable interim impact on the prevalence of unprotected sexual activity among teen mothers (Covington et al. 2015). Drawing on data from a rigorous random assignment evaluation involving nearly 900 new teen mothers in Los Angeles County, our earlier report showed that the *AIM 4 Teen Moms* program succeeded in reducing the prevalence of unprotected sexual intercourse among study participants. In addition, we found evidence that the program increased teen mothers' exposure to information on certain types of contraceptive methods. We measured these interim impacts using data from the study's 12-month follow-up survey, which was designed to be administered a year after participants had enrolled in the study, or roughly nine months after those participants assigned to the treatment group completed the last program session.

In the present report, we extend these results by examining the program's longer-term impacts using data from a 24-month follow-up survey. Our analyses focus on whether the *AIM 4 Teen Moms* program achieved its primary goal of reducing rates of repeat pregnancy among teen mothers. We also revisit the outcomes assessed in our earlier interim report to determine the longer-run impacts of *AIM 4 Teen Moms* on contraceptive use and other more exploratory outcomes, and whether the impact we observed on the prevalence of unprotected sex for the 12-month survey persisted at the time of the 24-month follow-up.

The evaluation involved a unique collaboration and partnership among several organizations. It was originally designed by staff at Children's Hospital Los Angeles (CHLA) and faculty at the University of Southern California in collaboration with researchers from ETR, a California-based nonprofit health and education organization. In fall 2010, the Family and Youth Services Bureau within the Administration for Children and Families of the U.S. Department of Health and Human Services (HHS) awarded CHLA competitive federal grant funding for the demonstration program. In early 2011, the program was then 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 the nation's teens. The PPA study is being conducted by Mathematica Policy Research and its partners, Child Trends and Twin

Peaks Partners, LLC, under contract with the Office of Adolescent Health (OAH) within HHS. Participating in PPA provided the evaluation with additional resources to support data collection and analysis. In addition, researchers from the PPA evaluation team have collaborated with CHLA and ETR 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 provide a more detailed description of the *AIM 4 Teen Moms* program, summarize key findings from our earlier interim report, and lay out the research questions for the present 24-month impact analysis. In Chapters II and III, we describe the study design, data, and analytic methods. In Chapter IV, we present findings from the final impact analysis and in Chapter V, we summarize and discuss the implications of the results.

A. The *AIM 4 Teen Moms* program

AIM 4 Teen Moms was adapted from an evidence-based teen pregnancy prevention effort called *Project AIM*—a group-based program that has shown promise in reducing sexual risk behaviors among at-risk middle school students. The program draws on principles of positive youth development and the Theory of Possible Selves (Markus and Nurius 1986) to encourage youth to imagine positive futures for themselves and adopt health-promoting behavior. *Project AIM* was evaluated in the early 2000s in a randomized controlled trial involving 242 predominantly low-income, African American middle school students in Birmingham, Alabama (Clark et al. 2005). The group-based program was tested through school classrooms ranging in size from 10 to 35 students. As tested, the program consisted of 10 sessions, 50 minutes each, delivered by trained facilitators (Clark et al. 2005). The study found that youth who participated in the program reported lower rates of sexual intercourse than those who received the standard school health curriculum. On the basis of these results, HHS recognized *Project AIM* as an evidence-based approach to teen pregnancy prevention. The dissemination package version of *Project AIM* consists of 12 sessions and is implemented in both schools and community settings. The program has also been adapted for use with other populations and in other settings.

The process of adapting *Project AIM* for a population of new teen mothers involved two main changes to the program. First, the program developer switched most of the sessions from a facilitator-led, group-based format to a more individualized, one-on-one meeting in the participant's home, delivered by trained program staff members known as *advisors*. This change was needed to address the common logistical barriers that can prevent teen mothers from participating in group-based programs, such as the need for child care, lack of transportation, and conflicts with school or work. The one-on-one format also allowed program staff to build trust and closer connections with program participants. Second, the program developer added content to the sessions to address birth spacing, reproductive planning, and parenting.

Because of these adaptations, the *AIM 4 Teen Moms* program features a total of nine sessions: seven one-hour home visits and two 90-minute group sessions (Table I.1). For the home visits, the advisors schedule times to meet with participants in their homes and deliver the seven sessions over a period of roughly 12 weeks. The sessions involve a mix of interactive discussion, brainstorming, role playing, and structured activities. The two group sessions take place in central community-based locations and bring together small groups of program participants near the middle and at the end of the program. These sessions seek to reinforce the

information provided during the home visits and give participants an opportunity to receive feedback and support from a network of peers. We provide a more detailed description of the program in our earlier interim impact report (Covington et al. 2015) and an accompanying implementation report (Asheer and Kisker 2014).

Table I.1. *AIM 4 Teen Moms* curriculum sessions

Session	Title	Purpose
Individual 1	Orientation, Legacy, and Careers as Future	Introduce concept of personal legacy; articulate a positive and a negative future; take a career interest inventory to identify career aspirations
Individual 2	Choosing My Career	Use results of career inventory to choose future career; visualize the future collage; engage in values clarification around having more children and contraception; introduce reproductive life plan
Individual 3	Building My Resume for Future Career	Create current resume; create resume for career aspirations; revisit reproductive life plan; discuss two birth control options chosen by participant
Individual 4	My Life and Those Who Lift Me Up	Create timeline of my life; superimpose milestones from reproductive life plan; identify positive and negative influences in my life; identify social support people
Group 1	Timelines, Detours, and Effective Communication	Condom demonstration; inspirational speaker; share career aspirations; guided imagery of positive future; add detours to timelines; communication role plays
Individual 5	Presenting Myself to the World	Thank-you letter activity; connect family planning to future; communication styles and relationship conflicts; interview for letter of recommendation
Individual 6	My Legacy	Bill of relationship rights; business cards for future career; preparing for graduation
Individual 7	Putting It Together	Letter to baby; review of reproductive life plan; assemble portfolio; planning my next steps
Group 2	Dinner Celebration	Inspirational speaker; letter of recommendations for future career; what *AIM 4 Teen Moms* means to me

The sessions involve a sequenced series of activities designed to build on the program participants' life experiences and reinforce the program's emphasis on positive youth development. The program emphasizes control over one's future, connects present actions and reproductive choices with future achievements, and defines motherhood as an identity strength rather than a stigma. Participants begin by identifying their future aspirations and choosing a career path upon which to focus for the purposes of the program. In later sessions, participants work with their advisors on writing resumes, drawing timelines, and identifying sources of emotional and financial support. Participants also develop a reproductive life plan that aligns with their present experiences and future goals. Throughout these activities, the program advisors engage participants in interactive discussions, covering such topics as current and future achievements, sources of support, and potential "detours" or "roadblocks" on the way to their goals. Near the end of the program, each participant compiles a personal "portfolio" containing the work they accomplished during the program.

Consistent with the program's overall focus and goal of helping teen mothers develop a plan to achieve their longer-term goals, the sessions also provide specific information on reproductive

health and contraceptive methods. As part of their reproductive life plan, participants identify if and when they would like to get pregnant again, how they plan to avoid unintended pregnancy, and how their plans fit with their broader educational and career goals. Participants also receive detailed information on a full range of contraceptive methods. During the home visits, program advisors bring a kit containing various contraceptive methods, including long-acting reversible contraception (LARC) methods. Participants are encouraged to examine the different items in the kit and ask questions about the pros and cons of different methods. Although *AIM 4 Teen Moms* does not provide participants with contraceptives directly, program advisors facilitate access to contraceptive services by providing a resource list of clinical service providers in the community, working with participants to help them identify their preferred contraceptive methods, and encouraging them to pursue these methods with a qualified health care professional. In addition, because many participants receive case management services through local community-based organizations, program advisors encourage participants to connect with their case managers if they need more assistance in obtaining their preferred contraceptive methods.

B. Summary of interim impact findings

To assess the impacts of the *AIM 4 Teen Moms* program, we conducted a random assignment evaluation involving almost 900 newly parenting teen mothers in Los Angeles County. As discussed in greater detail in Chapter II, the study team recruited participants primarily through referrals from community-based programs and social service agencies already serving teen mothers. Teen mothers were eligible for the study if they were ages 15 to 19 with one child who was 1 to 7 months old. Although not a specific eligibility requirement for the study, most of the study participants were Latina. Among the eligible women who agreed to participate in the study, we randomly assigned approximately half to the treatment group, which was eligible to receive the *AIM 4 Teen Moms* program, and half to the control group, which was not eligible for the program. In both study groups, we administered three rounds of surveys to study participants: (1) a baseline survey administered before random assignment, (2) an interim follow-up survey designed to be administered 12 months after participants had enrolled in the study, and (3) a longer-term follow-up survey designed to be administered 24 months after study enrollment.

In an earlier report, we used data from the baseline and first follow-up survey to assess the interim impacts of the program (Covington et al. 2015). Because that report examined the shorter-term impacts of *AIM 4 Teen Moms,* about nine months after participants were scheduled to complete the program, we focused on measuring program impacts on intermediate outcomes, such as contraceptive use and sexual risk behaviors. We also examined whether the program affected outcomes that possibly mediate changes in these behaviors, such as exposure to information on reproductive health information, school or work engagement and educational aspirations, attitudes toward safe sex and methods of protection, and intentions toward unprotected sexual activity and repeat pregnancy. We did not examine pregnancy outcomes for the interim report because of the limited time horizon. We summarize the key findings from the interim report in Table I.2 and discuss them in greater detail in the remainder of this section.

Table I.2. Interim impacts of the *AIM 4 Teen Moms* program

Measure	Treatment group	Control group	Difference	*p*-value
Percentage of women who reported having unprotected sex in the past 3 months[a]	23.1	29.7	-6.6*	0.03
Percentage of women who reported having sexual intercourse in the past 3 months without using each of the following:				
Any LARC[b]	56.1	59.5	-3.4	> 0.99
Implant	63.7	68.0	-4.3	> 0.99
Intrauterine device (IUD)	63.5	63.9	0.4	> 0.99
Condom	56.1	59.0	-2.9	> 0.99
Birth control pills	68.5	68.1	0.4	> 0.99
The shot (Depo-Provera)	61.0	62.0	-1.0	> 0.99
The patch	70.1	71.3	-1.2	> 0.99
The ring (NuvaRing)	70.2	71.2	-1.0	> 0.99
Percentage of women who reported having sexual intercourse in the past 3 months	66.2	68.9	-2.7	0.72
Number of self-reported sexual partners in the past 12 months	1.1	1.1	0.0	> 0.99
Percentage of women who reported receiving information on the following topics in the past 12 months:				
Implant (Implanon)	77.6	67.7	9.9*	0.02
IUD (Mirena or Paragard)	80.3	74.1	6.2	0.46
The shot (Depo-Provera)	81.2	75.8	5.4	0.78
The patch	79.6	73.6	6.0	0.58
The ring (NuvaRing)	78.5	74.3	4.2	> 0.99
Condoms	86.4	83.5	2.9	> 0.99
Birth control pills	84.1	83.4	0.7	> 0.99
Methods of birth control	84.6	82.5	2.1	> 0.99
Where to obtain birth control	86.8	85.0	1.8	> 0.99
Percentage of women who reported receiving information about birth control from each of the following sources:				
Home visit from a nurse, social worker, or other health care professional	28.1	21.0	7.1	0.26
Clinic appointment with a doctor, nurse, or other health professional	71.8	75.3	-3.4	> 0.99
Hospital	15.5	19.7	-4.2	> 0.99
Percentage of women currently enrolled in school or working part time or full time[c]	79.1	78.7	0.4	> 0.99
Percentage of women who expect to:				
Attend any schooling after high school	75.7	73.8	1.9	> 0.99
Graduate from a 4-year college	49.5	47.8	1.7	> 0.99
Percentage of women reporting they “strongly agree” that:				
Birth control should always be used when someone their age has sexual intercourse	60.8	61.5	-0.7	> 0.99
Birth control is a hassle	7.2	7.2	0.0	> 0.99
Birth control is pretty easy to get	48.0	45.0	3.0	> 0.99
Birth control is important to make sex safer	58.6	58.5	0.1	> 0.99
Birth control has too many negative side effects	9.4	10.9	-1.5	> 0.99

TABLE I.2. *(CONTINUED)*

Measure	Treatment group	Control group	Difference	*p*-value
Percentage of women reporting intentions to engage in the following behaviors in the next 12 months:				
Have sexual intercourse	76.3	81.0	-4.7	0.49
Use a LARC if having sex[b]	42.7	42.7	0.0	> 0.99
Use a condom if having sex	85.8	87.3	-1.5	> 0.99
Use protection method other than a condom if having sex[d]	87.3	91.0	-3.7	0.49
Percentage of women reporting that they are "sure" they will not become pregnant again before their child turns 2	60.5	57.2	3.3	> 0.99

Source: Covington et al. (2015).

Note: For each outcome, the numbers in the columns labeled "Treatment group" and "Control group" are regression-adjusted predicted values of outcomes at the 12-month follow-up survey. Each regression model included the following covariates: a binary indicator for treatment status, binary indicator variables for each recruitment location, age, race, a baseline measure of the outcome (if available), participants' self-reported relationship with baby's father, participants' age at first sexual intercourse, participants' language spoken at home, a scale measure of participants' support of contraceptive methods, and an indicator of whether the participant is a grade level behind for her age. Sample sizes accounting for item nonresponse range from 701 to 800, depending on the measure. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. See Covington et al. (2015) for a more detailed description of the analytic methods.

[a] Defined as having sexual intercourse without using an effective contraceptive method in the past three months.

[b] Includes the following contraceptive methods: IUD (Mirena or Paragard) or implant (Implanon).

[c] Includes enrollment in the following types of schools: middle or high school, continuation/alternative school or court/community school, adult education classes, technical or vocational school, two-year college, or four-year college or university. Both part-time and full-time work are considered working.

[d] Includes the following contraceptive methods: birth control pills, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), or implant (Implanon).

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

Drawing on data from the 12-month follow-up survey, we found that *AIM 4 Teen Moms* had a favorable impact on one of the primary interim behavioral outcomes targeted by the program: incidence of unprotected sex (Table I.2). In particular, we found that teen mothers randomly assigned to the treatment group were less likely than those assigned to the control group to report having unprotected sex in the past three months. At the time of the 12-month follow-up, 23.1 percent of participants in the treatment group reported having unprotected sex in the past three months, compared to 29.7 percent in the control group. In addition, although teen mothers in both study groups had relatively high rates of exposure to information on highly effective contraceptive methods, we found that teen mothers in the treatment group were more likely to receive information on some contraceptive methods—namely LARCs. Specifically, we found that teen mothers in the treatment group were significantly more likely to report having received information on hormonal implants when compared with teen mothers in the control group (77.6 percent versus 67.7 percent, $p = 0.02$).

However, we found no evidence of statistically significant impacts on other key interim outcomes—namely, school or work engagement, educational aspirations, attitudes toward birth control, or pregnancy intentions. Participants assigned to the treatment group were no more likely than those in the control group to report higher educational aspirations or engagement in school or work. For each of the five attitude measures examined, the reported differences

between the treatment and control groups are small and not statistically significant. We also found that participants in the treatment group were no more likely than those in the control group to report intentions to use LARCs or have a repeat pregnancy in the next 12 months.

We hypothesized that one possible explanation for these modest interim impacts was the large number of existing programs and services available in the areas in which the intervention was evaluated. Los Angeles County is an area of the country in which some teen mothers have access to a large but disparate array of programs and support services (Asheer and Kisker 2014). For example, among the teen mothers assigned to the control group, more than one in five (21.0 percent) reported having received home visiting services, and about three-quarters (75.3 percent) reported having received information on birth control during a clinic appointment with a doctor, nurse, or other health professional (Table I.2). For the purpose of this demonstration project and evaluation, CHLA sought to offer *AIM 4 Teen Moms* as a more cohesive, structured program particularly well suited to the needs of teen mothers. However, the results of our interim impact analysis suggested that many teen mothers in Los Angeles County already had access to some of the information targeted by the program.

C. Research questions

The present report adds to these findings by examining *AIM 4 Teen Moms*' longer-term impacts at the time of the 24-month follow-up survey. On the basis of the evidence presented in our earlier interim report, we hypothesized that the program's long-term impacts could go in either one of two ways. On the one hand, the lack of detectable impacts on such key interim outcomes as school or work engagement, educational aspirations, attitudes toward birth control, or pregnancy intentions could diminish or blunt any long-term effects on rates of rapid repeat pregnancy. On the other hand, our earlier interim report found favorable program effects on the most proximate and consequential determinant of repeat pregnancy: rates of unprotected sex. To examine these hypotheses, in the present report we use data from the 24-month follow-up survey to measure the program's longer-term impacts on rates of repeat pregnancy among study participants. We focus specifically on the following primary research question of interest:

- Does *AIM 4 Teen Moms* decrease rates of repeat pregnancy among new teen mothers, defined in this report as pregnancy onset between the birth of the first child and the completion of the 24-month follow-up survey?

To provide a comprehensive assessment of the program's impacts, we also assess several secondary research questions of interest. Reflecting the program's inclusion of elements focusing on healthy birth spacing and different contraceptive methods, we examine the program's potential to affect other important pregnancy-related outcomes—live births—and a woman's total number of reported pregnancies. The specific research question addressed is as follows:

- Does *AIM 4 Teen Moms* decrease rates of live births or a woman's total number of reported pregnancies?

We also revisit several key outcomes from our earlier interim report to examine whether and how the program's longer-term impacts on outcomes such as contraceptive use and sexual risk behaviors may differ from the impacts we observed in the short run. In particular, we assess the following three research questions, using data from the 24-month follow-up survey:

- Do the favorable program impacts on unprotected sexual activity persist through the 24-month follow-up survey?
- Does *AIM 4 Teen Moms* affect the use of different types of contraceptive methods?
- Does participation in *AIM 4 Teen Moms* have an impact on sexual risk behaviors not directly targeted by the program, such as rates of sexual activity and number of sexual partners?

Finally, since *AIM 4 Teen Moms* ties reproductive choices to achieving future life goals, it is possible that the program has spillover effects on other important outcomes, such as educational attainment. In particular, having a rapid repeat pregnancy may act as a barrier for a young woman to completing high school or any further education. We thus also assess the following research question:

- Are teen mothers who participate in *AIM 4 Teen Moms* more engaged in school or work and increasing their educational aspirations?

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II. STUDY DESIGN

We designed the study as a randomized controlled trial involving new adolescent mothers recruited from targeted areas of Los Angeles County. Among the participants deemed eligible for the evaluation, we randomly assigned about half (470 out of 942) to a treatment group that was offered the *AIM 4 Teen Moms* program and half (472 out of 942) to a control group not offered the program. Both treatment and control group participants had access to existing reproductive health services available through other local agencies that serve teen mothers. We calculate program impacts by comparing outcomes between the two groups using data from the study's 24-month follow-up survey.

In this chapter, we begin by describing the 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. In the next chapter, we describe the data, measures, and analytic methods used to estimate impacts of the *AIM 4 Teen Moms* program.

A. Sample enrollment and retention

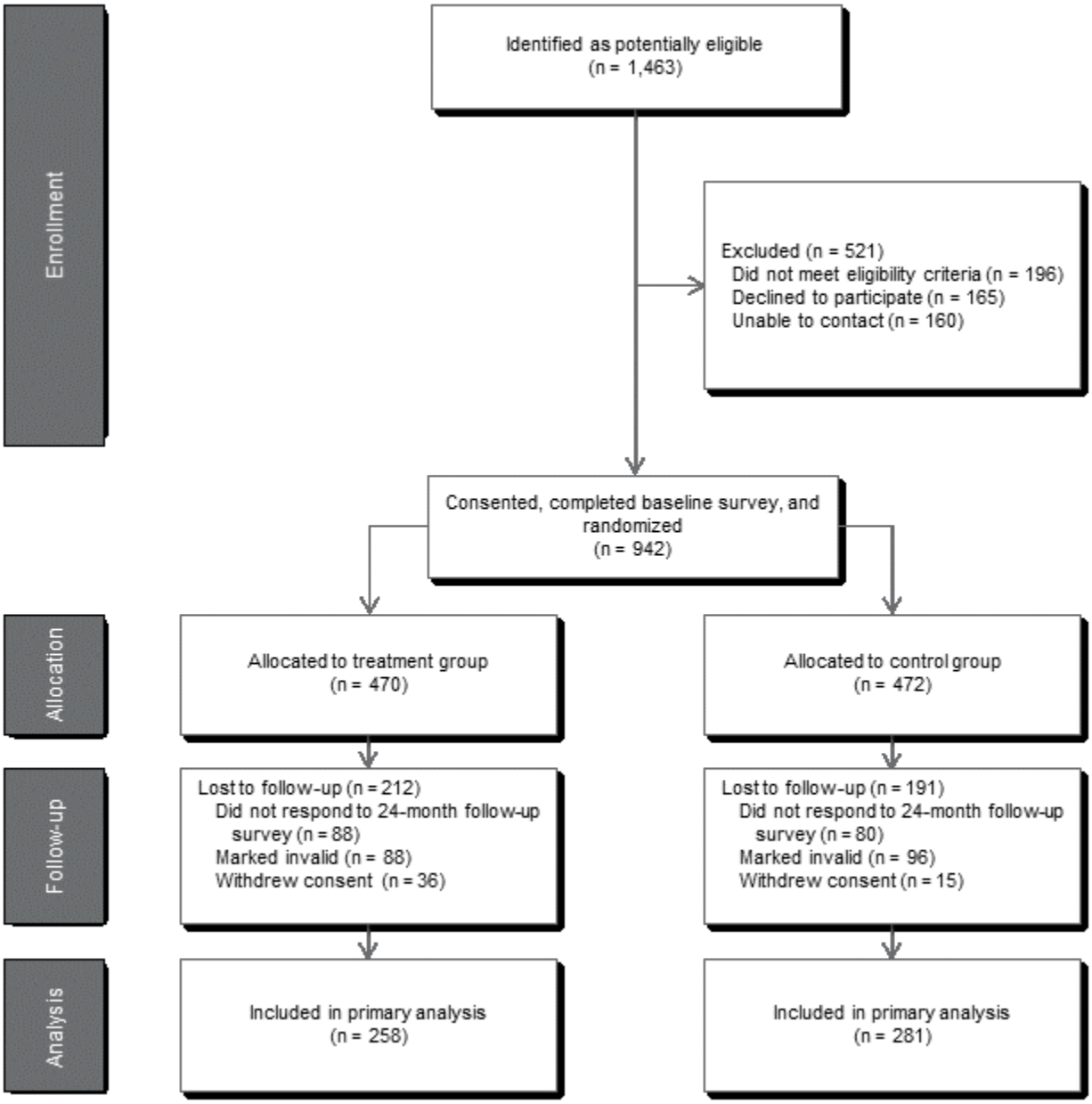
The study sample comprises low-income, newly parenting adolescent mothers in Los Angeles County. Participants were recruited primarily through referrals from community-based programs already serving teen mothers, outreach activities at local schools and health fairs, referrals from schools that serve pregnant and parenting teens, and referrals through local Special Supplemental Nutrition Program for Women, Infants, and Children offices. To further expand the outreach activities, CHLA also distributed flyers and brochures in targeted neighborhoods inviting potential participants to call a free study hotline number or text designated program staff. Recruited teens lived in three main geographic areas: South Los Angeles, Metropolitan Los Angeles, and the San Fernando Valley. The study eligibility criteria limited participation to adolescent mothers ages 15 to 19 with one child ages 1 to 7 months old.

Sample enrollment began in October 2011 and continued on a rolling basis until December 2013. About six weeks before the start of a given program cycle, CHLA program staff screened potential participants for eligibility and assigned a caseworker to each eligible participant. The caseworkers collected active consent for participation and scheduled a time to administer a baseline study survey. In most cases, they gathered consent at the women's residences, which allowed them to collect baseline data at the same time as consent. Participants had to provide active consent and complete the baseline survey to be included in the evaluation sample. One or two weeks before the start of a given program cycle, program staff then followed up with these eligible participants to confirm their interest in the study. Only those women who reaffirmed their interest eligible for random assignment.

Sample enrollment and random assignment were both managed through a secure web-based system developed and managed by the study team at Mathematica. We programmed the system to conduct random assignment using a permuted block design, a method that helps to ensure an even balance of participants across the treatment and control groups throughout the study period (Matts and Lachin 1988; Schultz and Grimes 2002). For this design, we specified a variable block size of up to four characters and a 1:1 allocation of participants across the treatment and

control groups. We also stratified the random assignment by recruitment location to avoid the possibility of a chance imbalance in the recruitment location between the treatment and control groups.

Figure II.1. Overview of sample enrollment and retention



The enrollment process yielded a total sample of 942 study participants (Figure II.1). We identified 1,463 adolescents as potentially eligible but excluded 521 (36 percent), usually owing to lack of interest (n = 165) or ineligibility (n = 196). Because of the exclusions, the study sample is not intended to be a random or representative sample of all adolescent mothers who were potentially eligible. Of the 942 adolescent mothers who agreed to participate, we randomized roughly half (470) to the treatment group and half (472) to the control group.

The study team designed the second follow-up survey to be administered 24 months after study enrollment. However, because of the variable time required to locate the participants and schedule the surveys, the exact timing of survey completion ranged from 21 to 28 months. The large majority of the respondents (95 percent) completed the survey between 23 and 26 months after study enrollment. We found no evidence that the time between baseline and second follow-up survey completion differed by study group (an average of 24 months for women in both the treatment and control groups). At the time of the second follow-up survey, participants were about 19.5 years old (ranging from 17 to 22 years), and their first child was 27 months old on average (ranging from 24 to 34 months).

For the second follow-up survey, we obtained a lower than expected response rate because we marked some surveys invalid due to concerns about the quality of the data. Among the 942 adolescent mothers randomly assigned to the treatment and control groups, study data collectors reported completing second follow-up surveys for 77 percent (n = 723) of the study participants. This finding is consistent with our expectation of having a response rate for the second follow-up survey in the range of 75 to 80 percent. However, for 184 of the study participants (88 participants randomly assigned to treatment group and 96 participants assigned to the control group), we marked their surveys invalid after questions arose about the data collection procedures that one of the study data collectors used. As a result, we have second follow-up data for a total of 539 participants, for an overall response rate of 57 percent. Thus, the decision to mark the surveys invalid for the one data collector in question lowered the overall response rate from 77 percent to 57 percent.

For the 24-month follow-up survey, we also found a modest difference in study retention rates between the treatment and control groups (Figure II.1). Among the 470 women in the treatment group, 55 percent (258) completed the 24-month follow-up survey and were included in the analysis sample. Among the 472 women assigned to the control group, 60 percent (281) completed the 24-month follow-up survey and were included in the analysis.

There are several possible reasons for the higher retention rate among control group participants. One involves the procedures used to track and locate participants for the follow-up surveys. For both the treatment and the control groups, trained field data collectors tried to check in with participants every one to three months to maintain communication and obtain current contact information. However, the data collectors were able to begin these locating efforts sooner for participants in the control group because they did not have to wait until after the program had ended to begin locating them. In addition, the overall burden of the study activities was much lower for participants in the control group because they were not asked to participate in any program services. The lower overall burden may have made these participants more willing to spend time completing the surveys.

We found no evidence that the difference in retention rates between the treatment and control groups biased our results. Such differences could present a potential threat to the internal validity of the study findings by creating systematic differences in the characteristics of the treatment and control groups. However, as reported later in this chapter, we found that the treatment and control groups appear similar on most baseline demographic and personal characteristics after accounting for the difference in retention rates. We cannot rule out the possibility of differences in other, unmeasured characteristics between the two groups. However,

on the basis of the observed demographic and personal characteristics, we find no evidence that the difference in retention rates created systematic differences in the characteristics of the groups. See Appendix A for a nonresponse analysis examining the characteristics of participants who did not complete the 24-month follow-up survey and are thus excluded from our analysis.

B. Baseline sample characteristics

We examined several characteristics of the treatment and control groups at baseline to characterize the study sample and check for baseline equivalence among the analytic sample. Overall, we found that study participants accurately reflected the program's target population and that, with few exceptions, differences between the treatment and comparison groups were small and not statistically significant. As illustrated in Tables II.1 and II.2, random assignment created study groups that had very similar characteristics, with statistically significant differences on only 3 of 25 examined characteristics. Compared with the young women in the control group included in the analysis, the young women in the treatment group were (1) less likely to be a grade level behind for their age (Table II.1), (2) more likely to report aspirations of graduating from a two- or four-year college (Table II.1), and (3) more likely to report multiple pregnancies (Table II.2).

The social and personal characteristics of the study sample are consistent with those of the population targeted by the *AIM 4 Teen Moms* program (Table II.1). At the time of the baseline survey, about one in 3 participants was 16 years old or younger. Consistent with the eligibility criteria, nearly 70 percent of the participants gave birth within three months before completing the baseline survey; all had given birth within seven months. The racial and ethnic characteristics of the population reflect that of the area targeted for recruitment: more than 80 percent of the sample was Latina, and almost 10 percent was black. Almost 70 percent of the sample reported that they usually speak Spanish when at home or with their family. Few of the participants lived with both their mother and father. Nearly 70 percent had no more than one parent figure in their home. Most (more than 85 percent) were enrolled in school or currently working at the time of the baseline survey, though just over 3 in 10 were behind by at least one grade level (based on their reported level and date of birth). Roughly half of participants reported that they would like to graduate from a four-year college or obtain a graduate degree.

Table II.1. Baseline demographic and personal characteristics

Measure	Treatment group	Control group	Difference	*p*-value[a]
Age in years (%)				
15	10.5	11.0	-0.5	0.73
16	26.4	23.1	3.3	
17	27.5	31.3	-3.8	
18+	35.7	34.5	1.2	
Child's age (%)				
0–3 months	65.9	68.9	-3.0	0.60
4–6 months	32.6	28.9	3.7	
7–12 months	1.6	2.1	-0.5	

TABLE II.1. *(CONTINUED)*

Measure	Treatment group	Control group	Difference	*p*-value[a]
Race/ethnicity (%)				
Latina	84.4	89.9	-5.5	0.11
Black	10.5	7.6	2.9	
White	2.3	0.4	1.9	
Other	2.7	2.2	0.5	
Language spoken at home (%)				
English	29.6	24.3	5.3	0.29
Spanish	18.8	22.8	-4	
Both English and Spanish	51.6	52.9	-1.3	
Household structure (%)				
Lives with mother	75.6	76.4	-0.8	0.82
Lives with father	30.6	35.4	-4.8	0.24
Lives with both mother and father	27.9	32.1	-4.2	0.28
Enrolled in school or currently working (%)	87.1	89.5	-2.4	0.37
Behind grade level (%)	32.9	41.6	-8.7*	0.04
Highest level of education would like to complete (%)				
Graduate from high school	14.5	24.6	-10.1*	0.04
Some technical or vocational training	4.7	4.3	0.4	
Graduate from a 2-year college	23.4	17.8	5.6	
Graduate from a 4-year college	35.2	28.5	6.7	
Obtain a graduate degree	20.3	22.1	-1.8	
Other	2.0	2.8	-0.8	
Relationship with baby's father (%)				
Married	1.2	2.6	-1.4	0.54
Living together but not married	22.7	21.4	1.3	
Dating but not living together	42.4	45.4	-3.0	
Not in a relationship	33.7	30.6	3.1	
Mother was a teen mother (%)	56.3	54.9	1.4	0.74
At least half of their friends are teen parents (%)	22.9	24.6	-1.7	0.63
Sample size[b]	258	281		

Source: Baseline surveys administered to study participants before random assignment.

[a] We used chi-square tests to calculate *p*-values for all categorical variables.

[b] Reported sample size is the number of women who completed the 24-month follow-up survey and were included in the analysis. It does not account for item nonresponse for any of the measures listed in the table.

* Significantly different from zero at the .05 level.

There was substantial variation in the status of participants' relationship with their baby's father among both treatment and control group members. Roughly two-thirds of participants were still in a romantic relationship with the father at the time of the baseline survey. This percentage included about one in five participants who reported being unmarried and living with the father. Just over 40 percent reported dating the father but not living with him. Among those who were not in a relationship with their baby's father, almost half reported that they did not have contact with him (not shown).

Teen pregnancy was not unusual in participants' families or peer groups. Slightly more than half of the sample had mothers who themselves had been teen parents. In addition, many participants reported having friends who have been teen parents. Nearly one in four reported that at least half their friends their age had been a teen parent.

Although a sizable proportion of women in the sample had become sexually active at a young age, most of them had few lifetime sexual partners (Table II.2), a pattern broadly consistent with the literature on Latina adolescents (Moore et al. 2013). About one-third of participants reported that they were younger than 15 when they first had sexual intercourse; less than 5 percent reported they were 13 or younger. Most participants reported few sexual partners in their lifetime, with half reporting having only one sexual partner and about 80 percent reporting three or fewer. Roughly 90 percent of the sample reported being pregnant just once. Most participants (81 percent) reported that the pregnancy leading to their baby was unplanned, though one in five reported that the pregnancy was intentional. Almost all participants reported that they would like to wait until their baby is at least 2 years old before getting pregnant again.

Despite their desire to avoid another pregnancy within the next few years, some participants at baseline reported recent sexual behavior without using an effective contraceptive method (Table II.2). Among women assigned to the treatment group, more than one-third reported having had sex in the past four weeks without using a LARC method, about a quarter reported having had sex without using a condom, and nearly one in five reported having had sex without using any effective contraceptive method. When asked about their intentions to use different contraceptive methods, more than 9 in 10 participants reported planning to use condoms over the next 12 months. Fewer participants (less than a third) reported intentions to use a LARC.

Table II.2. Baseline sexual risk behaviors and intentions

Measure	Treatment group	Control group	Difference	*p*-value[a]
Age at first sexual intercourse (%)				
<13 years	2.4	3.8	-1.4	0.65
13 or 14 years	30.5	30.3	0.2	
15+ years	67.1	65.9	1.2	
Lifetime number of sexual partners (%)				
1	49.4	49.8	-0.4	0.49
2–3	31.2	34.5	-3.3	
4+	19.5	15.7	3.8	
Pregnant more than once (%)	13.6	6.9	6.7*	0.01
Trying to get pregnant when got pregnant with baby (%)	18.1	19.7	-1.6	0.64
In past four weeks (%):				
Had sexual intercourse	41.6	39.7	1.9	0.65
Had sexual intercourse without a LARC[b]	37.7	33.6	4.1	0.31
Had sexual intercourse without condom	26.0	26.8	-0.8	0.84
Had any unprotected sexual intercourse[c]	17.9	12.8	5.1	0.10
If having sexual intercourse in the next year (%):				
Intends to use a LARC[b]	32.6	32.0	0.6	0.90
Intends to use a condom	93.0	89.2	3.8	0.12
Intends to use an effective method of protection[d]	87.2	84.4	2.8	0.36
Would like to wait until baby is at least 2 years old to get pregnant again (%)	96.3	93	3.3	0.22
Sample size[e]	258	281		

Source: Baseline surveys administered to study participants before random assignment.

[a] We used chi-square tests to calculate *p*-values for all categorical variables.

[b] Includes the following contraceptive methods: IUD (Mirena or Paragard) or implant (Implanon).

[c] Defined as having sexual intercourse without using an effective contraceptive method.

TABLE II.2. *(CONTINUED)*

[d] Includes the following contraceptive methods: birth control pills, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), or implant (Implanon).

[e] Reported sample size is the number of women who completed the 24-month follow-up survey and were included in the analysis; it does not account for item nonresponse for any measures included in the table.

* Significantly different from zero at the .05 level.

C. Treatment and control conditions

Treatment condition. Participants assigned to the treatment group were offered the 12-week *AIM 4 Teen Moms* program. As described in Chapter I, trained staff known as advisors delivered the program in seven one-hour home visits and two 90-minute group sessions. During each visit, the advisor guided the participants in a mix of imagining, brainstorming, role playing, communication, and creative activities. If a participant missed a home visit, the advisor called and texted her to reschedule. Participants were to complete the first four home visits before attending the first group session together. The group sessions, which took place in central community-based locations, reinforced the information provided during the home visits, offered participants an opportunity to share aspirations, and encouraged participants to give one another positive feedback and support.

Before the *AIM 4 Teen Moms* program began, all advisors received training on the curriculum. The developer, along with program staff, provided an initial three-day in-person training for advisors in summer 2011. During the initial training, the advisors participated in role plays and discussed the curriculum. Each advisor was then trained in developing reproductive life plans and certified as a family planning health counselor by the California Reproductive Health Council. To help improve delivery and increase advisors' comfort levels, the developer and program leaders monitored advisors and offered technical assistance when needed. Moreover, weekly meetings between the intervention director or program supervisor and advisors were arranged to ensure consistency and fidelity in implementing *AIM 4 Teen Moms*.

Our accompanying implementation study of *AIM 4 Teen Moms,* which focused on the initial stage of program implementation, found that advisors mostly adhered to prescribed content and activities during sessions. Results from a random sampling of fidelity-monitoring checklists showed that advisors completed all session activities about 80 percent of the time. However, missed sessions were common, and time and scheduling constraints often prevented make-up sessions. Anticipating that teen mothers would miss sessions, the developer incorporated redundancy into the curriculum to reinforce messages and help ensure that participants received all of the key content if they attended any five of the nine sessions. As a result, even though only 19 percent of the first 160 participants attended all nine sessions, most teens (81 percent) fulfilled the program requirement of attending five or more. Among participants who provided feedback about the program, teen mothers strongly agreed that participating in *AIM 4 Teen Moms* and spending time with their advisors was worthwhile, and they would recommend the program to other teen mothers. The *AIM 4 Teen Moms* implementation study describes the implementation successes and challenges in detail (Asheer and Kisker 2014).

Control condition. Participants assigned to the control condition were not offered *AIM 4 Teen Moms* but retained access to services already serving teen mothers. In Los Angeles County, teen mothers have access to a large but disparate array of programs and support services (Asheer and Kisker 2014). For example, CHLA staff reported that some teen mothers receive

individualized case management or home visiting services through local community-based organizations or health care providers. Staff also noted small neighborhood "Doc in a Box" health clinics as a popular resource among teen mothers. For those receiving state welfare assistance, the Cal-Learn program provides mandated case management services and financial incentives to promote high school graduation and family self-sufficiency. California's Adolescent Family Life Program (AFLP) annually provides additional case management, home visiting, and support services to 3,000 expectant and parenting teens in different parts of the state, with federal funding through the Pregnancy Assistance Fund program administered by OAH at HHS. According to CHLA staff, most of the teen mothers who participated in this study were recruited from existing Cal-Learn and AFLP programs. In this context, *AIM 4 Teen Moms* is unique, primarily because it provides a more cohesive, structured program centered on a curriculum with a well-defined sequence and theoretical model. As documented in the earlier implementation report (Asheer and Kisker 2014), the program was designed to improve on the more loosely connected network of existing programs and services available to teen mothers in Los Angeles County.

III. DATA, MEASURES, AND ANALYSIS

This analysis is based on data from two rounds of surveys completed by study participants in both the treatment and control groups. As discussed in Chapter II, all participants, as a condition of enrollment, completed a baseline survey before random assignment. The study team then administered two follow-up surveys, designed to be administered 12 and 24 months after study enrollment. To accommodate the participants' low anticipated literacy levels and allow them to answer sensitive personal questions privately, trained data collection staff administered the surveys in both English and Spanish, using audio computer-assisted self-interviewing (ACASI). The data collectors administered the surveys on a laptop computer in the participants' homes. They remained available in the home to provide support if needed while the participants completed the surveys, which collected a broad range of information on demographic and personal characteristics, family relationships, attitudes, sexual risk behaviors, and pregnancy histories. Participants received incentives for survey completion—$20 for the baseline and 12-month surveys, and $30 for the 24-month survey. In the remainder of this chapter, we first describe the outcome measures constructed from the 24-month follow-up survey. We then discuss the analytic methods used to assess the impacts of *AIM 4 Teen Moms* on those in the treatment group. Appendix B contains detailed information on the measures.

A. Outcome measures

Drawing on data from the 24-month follow-up survey, we constructed six groups of outcome measures, each corresponding to one of the PPA study's research questions: (1) repeat pregnancy, (2) other pregnancy-related outcomes, (3) unprotected sexual intercourse, (4) use of different contraceptive methods, (5) sexual risk behaviors not directly targeted by the program, and (6) school or labor market activity. These measures are summarized in Table III.1 and described in greater detail below.

Table III.1. 24-month outcome measures

Measure	Definition
Repeat pregnancy	
Repeat pregnancy	Binary variable: equals 1 if participant reported being currently pregnant or having had a pregnancy since the birth of her first child; equals 0 if she reported no current pregnancy and not having had a pregnancy since the birth of her first child
Other pregnancy-related outcomes	
New birth since birth of first child	Binary variable: equals 1 if participant reported giving birth since her first child was born; equals 0 if participant did not report giving birth since the birth of her first child
Number of pregnancies since birth of first child	Continuous variable: number of pregnancies since birth of first child
Unprotected sex	
Incidence of unprotected sex	Binary variable: equals 1 if participant had sexual intercourse without using an effective birth control method in the past 3 months; equals 0 if she did not have intercourse or always used an effective contraceptive method during intercourse

TABLE III.1. *(CONTINUED)*

Measure	Definition
Use of different contraceptive methods	
Had sexual intercourse without using a LARC	Binary variable: equals 1 if participant reported having sexual intercourse in the past 3 months without using a LARC; equals 0 if she did not have intercourse or always used a LARC during intercourse
Had sexual intercourse without using a contraceptive method	Series of seven binary variables: equals 1 if participant reported having sexual intercourse in the past 3 months without using a specified contraceptive method; equals 0 if she did not have sexual intercourse or used the specified contraceptive method during all months in which she was sexually active
Sexual risk behaviors not directly targeted by the program	
Incidence of sexual activity	Binary variable: equals 1 if participant reported having sexual intercourse in the past 3 months; equals 0 if she reported not having intercourse in the past 3 months
Number of partners	Continuous variable: number of reported sexual partners in the past 12 months
School or labor market activity	
School or work engagement	Binary variable: equals 1 if participant reported being enrolled in school or working full or part time; equals 0 if participant reported not being enrolled in school or working full or part time

1. Repeat pregnancy

As discussed in Chapter I, our primary outcome of interest—repeat pregnancy—is defined as the participant reporting on the 24-month survey that she had been pregnant since the birth of her first child. The 24-month survey asked participants several pregnancy-related questions that allowed us to create this measure. First, the survey asked participants if they were currently pregnant. If the respondent answered no to being currently pregnant, the survey then asked the respondent, "To the best of your knowledge, have you been pregnant since the birth of your first child?" We used responses to these questions to create a binary (yes/no) indicator of whether the participant had experienced a repeat pregnancy since the birth of her first child.

We constructed the preferred repeat pregnancy measure to (1) account for inconsistent responses across survey rounds and (2) minimize any missing data resulting from item nonresponse. To do so, we examined each participant's responses to the same pair of questions asked on the earlier 12-month follow-up survey. If a participant reported on the 12-month survey having had a repeat pregnancy but did not respond to the pregnancy-related questions on the 24-month survey, we coded her as having had a repeat pregnancy at the time of the 24-month survey. If a participant reported on the 12-month survey having had a repeat pregnancy but then contradicted this response on the 24-month survey by reporting not having been pregnant since the birth of her first child (and not currently being pregnant), we considered her responses to other questions to determine whether her reported repeat pregnancy at 12 months was valid. For example, the 12-month survey asked women for a due date if they reported being currently pregnant, or date of birth if they reported giving birth since the birth of their first child. The 12-month survey also asked participants whether they had stopped using birth control because they became pregnant. Examining this additional information helped establish the reliability of responses to the repeat pregnancy questions on the 12-month survey. A total of 28 participants reported conflicting repeat pregnancy information in the 12- and 24-month surveys. Using the additional information, we recoded 14 participants as having had a repeat pregnancy.

Because of the importance of this outcome for the analysis, we checked the sensitivity of our results based on the preferred repeat pregnancy measure by creating three alternative versions of the same outcome:

- **Alternative 1.** For this version of the outcome, we looked only at responses to the repeat pregnancy questions on the 24-month survey without checking the consistency of responses against data from the 12-month survey. A total of 28 participants had different values on this alternative version of the outcome than on our primary version: 14 of these participants were coded as having a repeat pregnancy on the primary version and not on the alternative version; the other 14 were coded as missing values on the primary version and not having had a repeat pregnancy on the alternative version.
- **Alternative 2.** For this version of the outcome, we required consistency in repeat pregnancy outcomes in both the 12- and 24-month surveys. If the participant reported not having been pregnant since the birth of her first child on the 24-month survey but reported a repeat pregnancy on the 12-month survey, we coded the outcome to missing. We coded 14 participants as having had a repeat pregnancy on the primary version but instead coded them as missing on the alternative 2 version.
- **Alternative 3.** For this version of the outcome, we incorporated information from a question on the number of pregnancies the participant had since the birth of her first child that was asked on the 12- and 24-month surveys. In particular, we required consistency both in responses on repeat pregnancy and on the number of reported pregnancies since the birth of her first child across the 12- and 24-month surveys. For example, if the participant reported a number of pregnancies on the 12-month survey greater than the number reported on the 24-month survey, we set the outcome to missing. Additionally, if a participant reported having a repeat pregnancy on the 24-month survey but not on the 12-month survey, we tried to validate this response by looking for a corresponding increase in the total number of pregnancies reported on the 24-month survey. If the pattern of responses to the question on the number of pregnancies since the birth of her first child did not confirm the repeat pregnancy, we considered the participant's responses inconsistent and set the outcome variable to missing. We coded 21 participants to missing in the alternative version and coded them as having a repeat pregnancy in the primary version.

As discussed later in Chapter IV, we find similar results across all of these versions of the repeat pregnancy measure, giving us confidence that our results are not sensitive to our particular coding decisions.

2. Other pregnancy-related outcomes

To provide a comprehensive assessment of the program, we constructed measures of two additional pregnancy-related outcomes in addition to our primary outcome of repeat pregnancy. These two additional measures are as follows:

- **New birth since birth of first child.** The 24-month survey asked participants who reported a repeat pregnancy about whether she had given birth since the birth of her first child. Because the outcome of birth is not explicitly mentioned in the question, the participant could report on a live birth or stillbirth. We used her response to this question to create a

binary (yes/no) indicator for whether the participant had had a new birth since the birth of her first child. We coded the measure as no if the respondent did not report a repeat pregnancy, if she reported being pregnant but having had no other pregnancies or births since the birth of the first child, or if she reported not being pregnant but having had a previous pregnancy that did not result in a birth since her first child.

- **Number of pregnancies since birth of first child.** The survey asked participants who reported a repeat pregnancy how many times they had been pregnant since the birth of their first child. We used the responses to this question to create a count variable capturing the reported total number of pregnancies since the birth of her first child. This measure was coded as zero if the participant did not report a repeat pregnancy.

3. Unprotected sexual intercourse

The survey asked participants whether they had engaged in sexual intercourse in the past three months without using any effective contraceptive method. The question was limited to vaginal (not oral or anal) intercourse. We defined an effective contraceptive method as having used a condom, birth control pills, the shot, the patch, the ring, an IUD, or the contraceptive implant. On the basis of the responses, we created a binary (yes/no) indicator for whether the participant reported having had unprotected sex. If participants reported having abstained from sexual intercourse over the past three months, we retained them in the analysis by coding them as "protected" and combining them with respondents who reported always having used an effective contraceptive method. To avoid confounding any program impacts on rates of unprotected sex with any potential impacts on repeat pregnancy rates, we did not account for pregnancy status at the time of the 24-month follow-up when constructing this outcome measure.

4. Use of different contraceptive methods

To assess participants' use of different types of effective contraceptive methods, the survey asked whether they had used contraceptive methods, such as condoms, birth control pills, the patch, and the implant, during months in which they were sexually active. (Appendix B contains a complete list.) We used these retrospective monthly reports of sexual activity and contraceptive use to create a series of seven binary (yes/no) indicators of whether the participant reported having had sexual intercourse in the past three months without using each of the contraceptive methods. To measure whether the participant reported having had sexual intercourse in the past three months without using a LARC, we combined two separate measures for use of (1) the contraceptive implant or (2) an IUD. If participants reported having abstained from sexual intercourse over the past three months, we retained them in the analysis by coding them as "protected" and combining them with respondents who reported having used contraception.

5. Sexual risk behaviors not directly targeted by the program

Because *AIM 4 Teen Moms* provides information on effective contraceptive methods, such as LARCs, the program might have unintended spillover effects on other risk outcomes. For this reason, we assessed program impacts on two key sexual risk outcomes not directly targeted by the program: (1) overall sexual activity rates and (2) number of sexual partners. For example, participants might report higher rates of sexual activity or an increased number of sexual partners after reducing their pregnancy risk through the use of LARCs. To examine the possibility of such unintended effects, we constructed two different measures:

- **Incidence of sexual activity.** The survey asked participants whether they had engaged in sexual intercourse during the past three months. The question was limited to vaginal (not oral or anal) intercourse. On the basis of the responses, we created a binary (yes/no) indicator of whether a participant reported having had sexual intercourse.
- **Number of sexual partners.** If respondents reported being sexually active, the survey asked them to report the number of different sexual partners they had had in the past 12 months. The question was limited to vaginal intercourse. On the basis of the responses, we created a continuous variable for the number of sexual partners in the past 12 months. If respondents reported having abstained from sexual intercourse during this time, we retained them in the analysis by coding them as having had zero sexual partners.

6. School or work engagement

To examine whether the program had its intended effects on targeted youth development outcomes, we examined the impact of the program on school and work engagement by combining responses from two survey questions. The first question asked participants about their current school status. Specifically, it asked participants whether they were enrolled in any one of the following types of schools: middle or high school, alternative school, adult education classes, technical or vocational school, or college. We considered participants as enrolled in school if they reported being enrolled in any type of school. The second question asked participants if they were currently working. The response categories ranged from "yes—full time" to "no—and not currently looking for a job." We considered participants as working if they reported working full time or part time. On the basis of responses to these questions, we created a binary (yes/no) indicator of whether a participant reported being enrolled in school or working. We combined responses from these questions into a single indicator to capture whether participants were meaningfully engaged in either of the two activities.

B. Analytic approach

We used a multivariate regression framework to analyze the impact of *AIM 4 Teen Moms* on each outcome. A regression framework is appropriate for this study because it allows us to account for the stratified random assignment design and any chance imbalances between the treatment and control groups. It also allows us to improve the precision of our impact estimates by statistically adjusting for any baseline covariates strongly correlated with our outcome measures. This approach of adjusting for baseline covariates can help achieve precision gains in the impact estimates by reducing the amount of residual variation in the outcome measures.

We estimated a separate regression model for each outcome. For binary outcome measures (for example, "had unprotected sex in the past three months"), we estimated impacts with logistic regression models. When reporting results from these models, we calculated mean marginal effects to express the impact estimates as percentage-point differences in outcomes between the treatment and control groups. For all other outcomes, we estimated ordinary least squares regression models. Appendix D explores the robustness of our results to alternative specifications of the regression models.

Each regression model included the following covariates: (1) a binary indicator for treatment status, (2) binary indicator variables for each recruitment location, (3) two key demographic

variables that research has shown to be highly correlated with our key outcomes of interest (age and race), (4) a continuous variable measuring the number of months between administration of the baseline and 24-month follow-up surveys to the participants, (5) the baseline measure of the outcome (if available), and (6) an additional set of baseline covariates empirically selected through a data-driven forward selection procedure because of their strong predictive power and potential to improve the precision of the impact estimates (described below). For all of these covariates, we used dummy variable adjustment to avoid losing any cases due to missing baseline data (Puma et al. 2009).

For the forward selection procedure, we used a data-driven stepwise procedure developed previously (Social and Character Development Research Consortium (2010). For this procedure, we considered as candidate covariates both (1) any baseline variable for which the observed difference between the treatment and control groups had a *p*-value of 0.20 or less based on a two-sided *t*-test, and (2) other baseline variables that have been shown in other studies to have a strong link with risky sexual behavior and repeat pregnancy. Appendix B provides a complete list of the covariates considered. From this list of candidate covariates, the forward selection 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). We conducted the selection procedure separately for the repeat pregnancy and sexual risk behavior outcomes. We then compared the selection results across outcomes and identified those covariates meeting either one of two conditions: (1) the covariate was selected by the stepwise procedure for at least 60 percent of the outcomes or (2) it was selected for only one outcome but the observed baseline difference between treatment and control groups in that covariate had a *p*-value of 0.20 or less. From among the full list of candidate covariates shown in Table B.1 in Appendix B, we selected for inclusion in the impact analysis only those meeting these conditions. We used the same list of covariates for estimating impacts on each outcome. Appendix D explores the robustness of our results to the use of models that exclude this covariate selection procedure.

We adjusted the statistical significance tests (*p*-values) 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 two measures of contraceptive use and two measures of nontargeted sexual risk behaviors. Unless taken into account, this multiplicity can increase the chances of making a false discovery and lead to spurious claims about the program's effectiveness. For example, 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 larger than 5 percent. To correct for this increased probability, we applied 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 restrictive than other common adjustment methods, such as the well-known Bonferoni correction, because it also accounts for any correlation in test statistics across outcomes within the same family.

We made this adjustment separately for each of the six 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 six 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 based our substantive conclusions for each question only on the corresponding group of outcome measures. The number of outcomes measured in other groups had no bearing on our substantive conclusions for each question and thus did not warrant an additional adjustment for multiple hypothesis testing.

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IV. RESULTS

Our findings show evidence of a marginal decline in rates of repeat pregnancy among women offered the *AIM 4 Teen Moms* program. Drawing on data from the study's 24-month follow-up survey, we found that women in the treatment group were less likely than those in the control group to report having had a repeat pregnancy. The estimated difference between groups ranges from about 3 to 7 percentage points, depending on the coding of the outcome measure. For our primary analysis, the estimated difference in rates is not statistically significant at the 5-percent level. However, in our additional sensitivity analyses, we found that the relative size and statistical significance of the impact is sensitive to some analytic decisions (Appendix D). In contrast to our earlier interim report, we found no evidence of favorable program impacts on rates of unprotected sexual activity or any of the other outcome measures examined. We detail these findings in the remainder of this chapter.

A. Repeat pregnancy and other pregnancy-related outcomes

For our primary analysis methods, we found no statistically significant difference between the treatment and control groups in the rate of repeat pregnancy (Table IV.1). Among participants in the treatment group, 28.4 percent reported having had a repeat pregnancy at the time of the 24-month follow-up survey, compared to 35.9 percent of participants in the control group. This finding implies that participants in the treatment group were about 20 percent (7.5/35.9 = 20.9) less likely to report a repeat pregnancy at the 24-month follow-up when compared with participants in the control group. The difference of 7.5 percentage points is not statistically significant at the 5-percent level (p-value = 0.07).

We found no evidence that *AIM 4 Teen Moms* affected the other pregnancy-related outcomes examined (Table IV.1). In both study groups, just over one in 10 participants reported a repeat pregnancy ending in a new birth (14.4 percent versus 13.5 percent). Moreover, the number of pregnancies since the birth of her first child was similar across study groups (0.3 in the treatment group versus 0.4 in the control group). For both outcomes, the estimated differences between groups are small and not statistically significant. We found substantively similar results in all of our sensitivity tests (see Appendix D).

In both study groups, the percentage of study participants reporting a repeat pregnancy resulting in a new birth was lower than the percentage reporting any repeat pregnancy for two reasons. First, some women were currently pregnant at the time of the 24-month follow-up survey (7.0 percent for the treatment group and 6.0 percent for the control group) and had not reached their pregnancy due date. Second, it is likely that some of the participants experienced pregnancies that had preterm outcomes, such as miscarriage or abortion. The 24-month survey did not ask questions on pregnancy outcomes, such as whether the pregnancy ended in a miscarriage or abortion. However, a recent study found that in 2010, approximately 15 percent of teen pregnancies in the U.S. end in a miscarriage and 30 percent end in an abortion, which may help explain the remaining gap between the rates of repeat pregnancy and new births (Kost and Henshaw 2014).

Table IV.1. Impacts on repeat pregnancy and related outcomes

Measure	Treatment group	Control group	Difference	*p-value*
Percentage of women who reported a repeat pregnancy on the 24-month survey	28.4	35.9	-7.5	0.07
Percentage of women who reported a repeat pregnancy resulting in a new birth on the 24-month survey	14.4	13.5	0.9	>0.99
Number of pregnancies since birth of first child reported on the 24-month survey	0.3	0.4	-0.1	0.53

Source: Baseline and follow-up 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 24-month follow-up survey. Each regression model included the following covariates: age, race, gender, treatment status, indicator variables for the matched pairs or strata created for random assignment, and a baseline measure of the outcome (when available). See Appendix B for the full list of covariates. Sample sizes accounting for item nonresponse range from 513 to 535, 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.

B. Sexual risk behaviors

As discussed in Chapter I, our earlier interim report found promising short-term effects of *AIM 4 Teen Moms* in reducing the incidence of unprotected sex (Covington et al. 2015). In particular, at the time of the 12-month follow-up survey, we found that study participants in the treatment group were significantly less likely than those in the control group to report having had unprotected sex in the past 3 months (23.1 percent versus 29.7 percent; $p < 0.05$).

Drawing on longer-term data from the 24-month survey, we found that the difference in rates of unprotected sex across treatment and control groups had declined and is no longer statistically significant (Table IV.2). Among participants in the treatment group, 26.6 percent reported having had unprotected sex in the 3 months prior to the 24-month survey, compared to 23.3 percent of the control group. The difference of 3.3 percentage points is not statistically significant. This small difference in the rate of unprotected sex is largely driven by declining rates of unprotected sex among control group participants (Figure IV.1). Among these participants, the percentage of women who reported having had unprotected sex in the past 3 months declined from 29.7 percent at the time of the 12-month survey to 23.3 percent at the time of the 24-month survey. Among participants in the treatment group, the percentage increased by a small amount (23.1 percent in the 12-month survey and 26.6 percent in the 24-month survey).

Table IV.2. Impacts on sexual risk behaviors

Measure	Treatment group	Control group	Difference	*p*-value
Percentage of women who reported having had unprotected sex in the past 3 months[a]	26.6	23.3	3.3	0.41
Percentage of women who reported having had sexual intercourse in the past 3 months without using each of the following:				
Any LARC[b]	53.7	53.5	0.2	>0.99
Implant	63.7	68.9	-5.2	>0.99
IUD	62.3	59.1	3.3	>0.99
Condom	46.4	45.8	0.6	>0.99
Birth control pills	68.9	70.5	-1.7	>0.99
The shot (Depo-Provera)	65.3	69.5	-4.2	>0.99
The patch	72.1	73.7	-1.6	>0.99
The ring (NuvaRing)	71.4	74.7	-3.3	>0.99
Percentage of women who reported having had sexual intercourse in the past 3 months	70.1	73.9	-3.8	0.65
Number of self-reported sexual partners in the past 12 months	0.8	0.8	0.0	>0.99

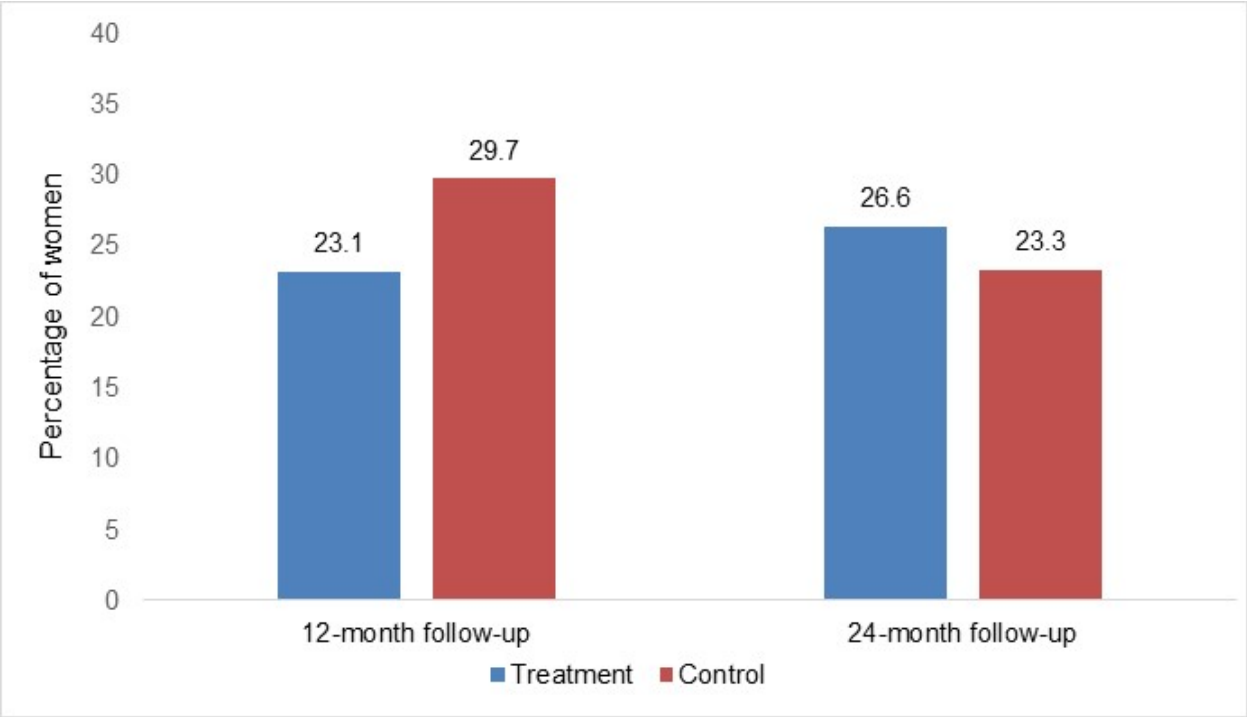
Source: Baseline and follow-up surveys administered.

Notes: For each outcome, the numbers in the columns labeled “Treatment group” and “Control group” are regression-adjusted predicted values of outcomes at the 24-month follow-up survey. Each regression model included the following covariates: age, race, gender, treatment status, indicator variables for the matched pairs or strata created for random assignment, and a baseline measure of the outcome (when available). See Appendix B for the full list of covariates. Sample sizes accounting for item nonresponse range from 510 to 530, 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.

[a] Defined as having had sexual intercourse without using an effective contraceptive method in the past 3 months.

[b] Includes the following contraceptive methods: IUD (Mirena or Paragard) or implant (Implanon).

Figure IV.1. Incidence of unprotected sex in the past three months



Source: Surveys administered to study participants by evaluation team.

Note: The numbers in the columns labeled "Treatment group" and "Control group" are regression-adjusted predicted values of outcomes at the 12- or 24-month follow-up survey. See Chapter III for a detailed description of the measure and analytic methods.

We found no evidence of statistically significant program impacts on any of the other measures of sexual risk behavior we examined (Table IV.2). In particular, participants in both groups were equally likely to report having had sex without using a LARC (53.7 of participants in the treatment group and 53.5 of participants in the control group). The percentage of women who reported having had sex in the past 3 months was also similar across groups (70.1 percent for the treatment group versus 73.9 percent for the control group), and we found no difference in the number of self-reported sexual partners in the past 12 months (an average of 0.8 partners for both the treatment and control groups). We found substantively similar results for all of our sensitivity tests (see Appendix D).

C. Educational and labor market outcomes

Finally, we examined whether the program's focus on reducing rates of repeat pregnancy had any impacts on the educational or labor market outcomes of program participants. Drawing on data from the study's 24-month follow-up survey, we found no statistically significant differences in the measures of school or work engagement (Table IV.3). About three-fourths of participants in both study groups reported that they were working or enrolled in school (73.9 percent of participants in the treatment group and 75.7 percent of participants in the control group). In both study groups, about one in four participants were enrolled in school at the time of the 24-month follow-up survey (36.8 percent in the treatment group and 39.8 percent in the control group). About three in four participants were working part time or full time. These findings are consistent with what we found in the interim report and may reflect in part the

relatively high level of engagement in school or work reported by the large majority of study participants.

Table IV.3. Impacts on school or work engagement

Measure	Treatment group	Control group	Difference	*p-value*
Percentage of women currently enrolled in school or working part time or full time[a]				
Currently enrolled in school or working part time or full time[a]	73.9	75.7	-1.9	>0.99
Enrolled in school	36.8	39.8	-2.9	>0.99
Working part time or full time[a]	73.9	75.7	-1.9	>0.99

Source: Baseline and follow-up surveys administered.

Notes: For each outcome, the numbers in the columns labeled "Treatment group" and "Control group" are regression-adjusted predicted values of outcomes at the 24-month follow-up survey. Each regression model included the following covariates: age, race, gender, treatment status, indicator variables for the matched pairs or strata created for random assignment, and a baseline measure of the outcome (when available). See Appendix B for the full list of covariates. The sample size accounting for item nonresponse ranges from 524 to 526. 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] Includes enrollment in the following types of schools: middle or high school, continuation/alternative school or court/community school, adult education classes, technical or vocational school, two-year college, and four-year college or university. Both part-time and full-time work are considered working.

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V. DISCUSSION

This report presents the final 24-month impact findings from a large-scale demonstration project and evaluation of the *AIM 4 Teen Moms* program, which is designed to improve contraceptive use and reduce the risk of rapid repeat pregnancy among new teen mothers. In an earlier report based on data from the study's interim 12-month follow-up survey, we found that *AIM 4 Teen Moms* had a favorable impact on one of the primary behavioral outcomes targeted by the program: incidence of unprotected sex (Covington et al. 2015). In the present report, we examined whether the program's interim success in reducing rates of unprotected sexual activity led to longer-term declines in rates of rapid repeat pregnancy. For additional secondary analyses, we also examined program impacts on other sexual risk behaviors and reproductive outcomes of interest, as well as program impacts on targeted youth development outcomes, such as school or work engagement.

Drawing on data from the 24-month follow-up survey, we found evidence of a marginal decline in rates of rapid repeat pregnancy among women offered the *AIM 4 Teen Moms* program. For our primary analysis methods, we found that women in the treatment group were about 8 percentage points less likely than those in the control group to report having had a repeat pregnancy (28.4 percent for the treatment group versus 35.9 percent for the control group). Although the observed difference in rates is not statistically significant at the 5-percent level (p-value = 0.07), in our additional sensitivity analyses we found that both the relative size and statistical significance of the impact was sensitive to certain analytic decisions (Appendix D). Across these different sensitivity tests, the relative size of the impact ranged from just over 3 to almost 9 percentage points. In two of the tests, the impact estimate reached statistical significance at the 5-percent level.

We found no evidence to suggest that the program's shorter-term impacts on rates of unprotected sexual activity persisted throughout the 24-month follow-up period. At the time of the 24-month follow-up survey, about one in four participants in both study groups reported having had sex without using any effective method of protection (26.6 for the treatment group versus 23.3 for the control group). Similarly, we found that women in the treatment group were just as likely as those in the control group to report having had sex without using a LARC method (53.7 for the treatment group versus 53.5 percent for the control group). We found substantively similar results in all of our sensitivity tests.

Considering these findings in combination with those from our earlier interim report (Covington et al 2015), one possible explanation is that the impacts of the program were more modest or short lived than intended or than the study had the ability to detect. For the measure of unprotected sex, we found a modest impact of the program at the time of the 12-month follow-up survey that later faded by the time of the 24-month follow-up. For the other measures of contraceptive use and sexual risk behavior, we found no evidence of favorable program impacts at either time. We initially designed the study assuming a 24-month impact on repeat pregnancy rates in the range of 8 or 9 percentage points, assuming a final sample size of about 800 women (Smith et al. 2012). In practice, we ultimately found an estimated impact that ranged from just over 3 to almost 9 percentage points, depending on the specific analysis methods, with a sample size of 539 women that was smaller than expected. Given the evidence of relatively modest

program impacts on rates of unprotected sex and a smaller-than-expected sample, our main finding of a modest decline in repeat pregnancy rates is perhaps not surprising.

Evidence of modest program impacts is also consistent with the possibility that the large number of existing programs and services available in the Los Angeles County area may have limited the program's ability to generate larger effects. The study recruited participants primarily from three targeted communities within Los Angeles County, an area of the country in which some teen mothers have access to a large but disparate array of programs and services (Asheer and Kisker 2014). To improve on these existing services, CHLA sought to provide a more cohesive, structured program centered on a curriculum with a defined sequence and a well-defined theoretical model. However, on the basis of the outcomes we observed for the control group members of the study, it appears that many teen mothers in Los Angeles County already have access to some of the information targeted by the program to aid teen mothers in accomplishing their long-term goals (Covington et al. 2015). For these reasons, it is possible that the favorable shorter-term program impacts on unprotected sexual activity diminished by the 24-month follow-up survey because participants in the control group had access to alternative services. *AIM 4 Teen Moms* may have the potential to yield longer-term effects if implemented in areas with fewer available programs and support services.

Finally, as noted in our earlier interim report, the study findings may also reflect the particular population included in this analysis. Because the study relied on a volunteer sample, the particular teens recruited may not represent the broader population of low-income mothers in Los Angeles County. In particular, the mothers recruited for this study may be those most likely to seek out other available programs and services or those with the greatest motivation to avoid a rapid repeat pregnancy and pursue their educational and career aspirations. Indeed, our analysis of data from the baseline surveys found that, even before the program began, most study participants were engaged in school or work and had high educational aspirations. In addition, our analysis suggests that the teen mothers lost to follow-up represented a higher-risk population than the sample of those included in the analyses presented in this report. As a result, our final impact findings may not generalize to all young women originally recruited for the study.

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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 24-month follow-up survey. Among the 942 young women who enrolled in the study and were randomly assigned to the treatment and control groups, 539 completed a valid 24-month follow-up survey, for an overall response rate of 57 percent. The remaining 403 participants did not do so; we excluded them from the final impact analyses presented in this report.

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 25 measures of demographic characteristics, personal characteristics, sexual risk behaviors, and intentions (Tables A.1 and A.2). On the basis of this comparison, we found three statistically significant differences. Compared to the 539 young women included in the analysis, the 403 nonrespondents were (1) less likely to be Latina, (2) less likely to be living with their parents, and (3) less likely to report intending to use an effective form of contraceptive protection if having sexual intercourse in the next year. We also found marginal differences between the groups in other characteristics, such as baseline rates of sexual activity and intentions to use a LARC if having sexual intercourse in the next year; however, these differences were not statistically significant at the 5-percent level.

Taken together, these findings suggest that the sample of 403 nonrespondents represented a somewhat higher-risk population than the sample of 539 young women included in our final impact analyses. Thus, our final impact findings may not generalize to all young women originally recruited for the study. As discussed in Chapter V, because the study relied on a volunteer sample, the teen mothers originally recruited were not intended to represent the broader population of low-income mothers in Los Angeles County. The observed differences in characteristics between the respondents and nonrespondents are consistent with this broader description of the study sample.

Table A.1. Baseline demographic and personal characteristics

Measure	Respondents	Nonrespondents	Difference	*p*-value[a]
Age in years (%)				
15	10.8	12.9	-2.1	0.60
16	24.7	21.6	3.1	
17	29.5	29.9	-0.4	
18+	35.1	35.6	-0.5	
Child's age (%)				
0–3 months	67.5	65.1	2.4	0.72
4–6 months	30.7	33.2	-2.5	
7–12 months	1.9	1.8	0.1	
Race/ethnicity (%)				
Latina	87.3	81.4	5.9*	0.04
Non-Latina black	9.0	14.7	-5.7*	
Non-Latina white	1.3	0.8	0.5*	
Non-Latina other	2.4	3.1	-0.7*	
Language spoken at home (%)				
English	26.8	30.7	-3.9	0.43
Spanish	20.9	20.4	0.5	
Both English and Spanish	52.3	49.0	3.3	
Household structure (%)				
Lives with mother	76.0	71.1	4.9	0.09
Lives with father	33.1	23.6	9.5**	<0.01
Lives with both mother and father	30.1	21.9	8.2**	<0.01
Enrolled in school or currently working (%)	88.3	84.4	3.9	0.08
Behind grade level (%)	37.5	41.3	-3.8	0.24
Highest level of education would like to complete (%)				
Graduate from high school	19.7	24.8	-5.1	0.37
Some technical or vocational training	4.5	2.8	1.7	
Graduate from a 2-year college	20.5	21.0	-0.5	
Graduate from a 4-year college	31.7	30.5	1.2	
Obtain a graduate degree	21.2	18.5	2.7	
Other	2.4	2.5	-0.1	
Relationship with baby's father (%)				
Married	1.9	1.5	0.4	0.22
Living together but not married	22.1	20.5	1.6	
Dating but not living together	43.9	39.2	4.7	
Not in a relationship	32.1	38.7	-6.6	
Mother was a teen mother (%)	55.6	52.8	2.8	0.40
At least half of friends are teen parents (%)	23.8	23.9	-0.1	0.97
Sample size[b]	539	403		

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

[a]We used chi-square tests to calculate *p*-values for all categorical variables.

[b]Reported sample sizes do not account for item nonresponse.

*Significantly different from zero at the .05 level.

**Significantly different from zero at the .01 level.

Table A.2. Baseline sexual risk behaviors and intentions

Measure	Respondent	Nonrespondents	Difference	*p*-value[a]
Age at first sexual intercourse (%)				
<13 years	3.1	3.1	0.0	0.23
13 or 14 years	30.4	35.8	-5.4	
15+ years	66.5	61.1	5.4	
Lifetime number of sexual partners (%)				
1	49.6	45.9	3.7	0.57
2–3	32.9	35.0	-2.1	
4+	17.5	19.0	-1.5	
Pregnant more than once (%)	10.1	9.8	0.3	0.85
Trying to get pregnant when got pregnant with baby (%)	18.9	20.2	-1.3	0.65
In past four weeks (%):				
Had sexual intercourse	40.6	44.8	-4.2	0.20
Had sexual intercourse without a condom	26.4	31.5	-5.1	0.09
Had sexual intercourse without a LARC[b]	35.6	40.1	-4.5	0.16
Had unprotected sexual intercourse[c]	15.2	19.7	-4.5	0.08
If having sexual intercourse in the next year (%):				
Intends to use a condom	91.0	92.3	-1.3	0.47
Intends to use a LARC[b]	32.3	27.9	4.4	0.15
Intends to use an effective method of protection[d]	85.7	80.8	4.9*	0.05
Would like to wait until baby is at least 2 years old to get pregnant again (%)	94.7	90.3	4.4	0.07
Sample size[e]	539	402		

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

[a] We used chi-square tests to calculate *p*-values for all categorical variables.

[b] Includes the following contraceptive methods: IUD (Mirena or Paragard) or implant (Implanon).

[c] Defined as having sexual intercourse without using an effective contraceptive method.

[d] Includes the following contraceptive methods: birth control pills, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), or implant (Implanon).

[e] Reported sample sizes do not account for item nonresponse.

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APPENDIX B

DATA AND MEASURES

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In this appendix, we provide more detailed information on survey data collection and measures. We begin by describing the survey design and administration. We then detail how we constructed some of the key 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 evaluation is based on survey data collected in (1) a baseline survey administered before enrollment in the study, (2) a follow-up survey administered 12 months after study enrollment, and (3) a follow-up survey administered 24 months after study enrollment. For all three surveys, data collectors used audio computer-assisted self-interviewing (ACASI) to accommodate the participants' low anticipated literacy levels and to allow them to answer sensitive personal questions privately. Moreover, by allowing the participants an opportunity to resolve inconsistent data, ACASI reduces the frequency of inconsistent responses that might not be resolved when using paper-and-pencil surveys.

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, views and attitudes toward safe sex and the use of effective contraceptive methods, sexual activity, past pregnancies, and intentions to avoid unprotected sex and repeat pregnancy. 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 the questions to fit our ACASI survey mode. We also made minor changes to question wording and response categories to align with our target population of new teen mothers.

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 the questions about sexual behavior, intentions to avoid a future pregnancy, contraceptive use, and attitudes about contraception use. For these measures, reporting bias can occur in either direction. On one hand, participants in the treatment group may be less likely to report 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 among young women in the treatment group. On the other hand, the program might make young women in the treatment group better informed about sexual risk behaviors and thus more likely to report their true 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 young women in the treatment group.

These risks were minimized by two main factors. First, ACASI encourages honest reporting by allowing sensitive personal questions to be answered privately on a computer. Second, independent field staff administered the surveys; they were trained and employed by the study team, not CHLA program staff or anyone else personally connected to the participants.

B. Outcome measures

As discussed in Chapter III, we examined program impacts on six groups of outcome measures: (1) repeat pregnancy, (2) other pregnancy-related outcomes, (3) unprotected sexual

intercourse; (4) use of different contraceptive methods; (5) sexual risk behaviors not directly targeted by the program, and (6) school or labor market activity. We provide a summary description of these measures in Chapter III of this report. In this section, we provide additional detail on how we constructed the measures of sexual risk behaviors, use of different contraceptive methods, and school or labor market activity.

1. Unprotected sexual intercourse

To determine whether *AIM 4 Teen Moms* succeeded in reducing rates of unprotected sex, we constructed a binary (yes/no) indicator for whether the study participant reported having sex in the past three months without using any effective contraceptive method. We constructed this variable in a step-wise fashion from two sexual behavior questions in the survey:

1. Have you had sexual intercourse in the past three months?
2. The next question is about your use of the following methods of birth control: condoms, birth control pills, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), or implant (Implanon). In the past three months, how many times have you had sexual intercourse without using any of these methods of birth control?

Using responses to these questions, we first constructed the binary (yes/no) variable for whether the participant reported having had sexual intercourse in the past three months. We then constructed the binary (yes/no) variable that indicates whether the participant reported having had sex without any effective contraceptive method in the past three months. For this binary measure, we compared participants who reported having had sexual intercourse without using an effective contraceptive method at least once to participants who reported that they had not had sexual intercourse without using an effective contraceptive method. Participants who reported being abstinent in the past three months were retained in the analysis and assigned a value of zero (no) for the outcome that measures whether they reported having had sex without an effective contraceptive method in the past three months.

2. Use of different types of effective contraceptive methods

We collected data on the use of effective contraceptive methods with a calendar that recorded 12-month retrospective information on participants' sexual activity. Specifically, the survey asked participants who had sex in the past 12 months about the contraceptive methods they used during each month in which they were sexually active. The response categories included condom, birth control pill, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), and implant (Implanon).

For each contraceptive method, we created a binary (yes/no) indicator of whether the participant reported having had sexual intercourse in the past three months without using that method. We also combined the IUD and implant indicators to generate a measure of whether the participant had sexual intercourse in the past three months without using a LARC. If participants reported abstaining from sexual intercourse over the past three months, we retained them in the analysis by coding them as "protected" (no) and combining them with participants who reported using the contraceptive method. To be coded as "yes," participants had to report only that they had sexual intercourse without using the contraceptive method in at least one of the three months before the date they completed the 24-month follow-up survey. If participants did not report that

they had sexual intercourse without using the contraceptive method in a least one of the past three months and did not provide data for at least one month, we coded them as missing values.

3. Sexual risk outcomes not directly targeted by the program

To examine whether the program's emphasis on promoting the use of highly effective contraceptive methods, such as LARCs, had any unintended spillover effects on other types of sexual risk behaviors not directly targeted by the program, we constructed two other measures: (1) a binary indicator (yes/no) of whether the participant reported having had sexual intercourse in the past 3 months and (2) a continuous variable measuring the number of sexual partners in the past 12 months. We constructed these variables from the following three sexual behavior questions on the survey:

- Have you had sexual intercourse in the past 3 months?
- Have you had sexual intercourse in the past 12 months?
- How many DIFFERENT PEOPLE have you had sexual intercourse with, even if only one time, in the past 12 months?

Using the responses, we first constructed the binary (yes/no) variables for whether the participant reported having had sexual intercourse in the past 3 months and whether she had sexual intercourse in the past 12 months. Participants who reported being abstinent over the past 12 months were retained in the analysis and assigned a value of zero for the outcome that measures participants' self-reported number of sexual partners in the past 12 months. If the participant reported having had sex in the past 12 months, the number of sexual partners is self-reported. For each measure, we coded participants who did not respond to the question as missing values.

4. School or work engagement

The 24-month follow-up survey included two questions designed to assess participants' school or work engagement. The survey first asked participants their current school status, from which participants could select one of the following responses:

- Enrolled in public or private middle school or high school
- Enrolled in continuation/alternative school or court/community school
- Enrolled in adult education classes
- Enrolled in technical or vocational school
- Enrolled in two-year college
- Enrolled in four-year college or university
- Not currently enrolled in any school or classes

We used responses to this question to construct a binary measure comparing participants who reported being enrolled in any of the school programs to those who reported not being

enrolled in any school or classes. We coded participants who did not respond to the question as missing values.

The survey next asked participants if they were currently working. The response categories included "yes—full time," "yes—part time," "no—but currently looking for a job," and "no—and not currently looking for a job." We used the responses to construct a binary measure comparing participants who reported "yes—full time" or "yes—part time" to those who reported "no—but currently looking for a job" or "no—and not currently looking for a job." We coded participants who did not respond as missing values.

On the basis of values for the binary variables that indicated whether the participant was enrolled in school and whether the participant was working, we created a binary (yes/no) indicator of whether a participant reported being enrolled in school or working. For this measure, we coded participants as "yes" if they reported being enrolled in school or working. We coded them as "no" if they reported not being enrolled in school and not working. We coded them as missing values if they (1) did not respond to questions on school and work status, (2) reported not being enrolled in school and did not respond to the question on work status, or (3) reported not currently working and did not respond to the question on school status.

C. Baseline measures considered as candidate covariates

As discussed in Chapter III, we included several types of baseline covariates in the regression models used to estimate program impacts. We included some of these covariates to account for the stratification used for random assignment. We included others to improve the precision of the impact estimates. To help select the covariates used for precision gains, we used a previously developed data-driven stepwise selection procedure (Social and Character Development Research Consortium 2010). For this procedure, we considered as candidate covariates a variety of baseline variables that have been shown in other studies to have a strong link with sexual risk behavior and repeat pregnancy. Table B.1 provides a complete list of the variables considered.

The results of the selection procedure identified 10 variables to include as additional covariates: (1) an indicator for whether more than half of the participant's friends of her age have been pregnant, (2) an indicator for whether the participant intends to use a condom if having sexual intercourse, (3) an indicator for whether the participant has had more than one pregnancy, (4) an indicator for whether the participant has had sex without using birth control in the past four weeks, (5) an indicator for whether the participant has had sex without using a LARC in the past four weeks, (6) an indicator for whether the participant is "sure" she will not be pregnant again before her first child is 2 years old, (7) the participant's lifetime number of sexual partners, (8) her self-reported relationship with the baby's father, (9) the participant's language spoken at home, and (10) an indicator of whether she is a grade level behind for her age.

Table B.1. Measures of baseline sample characteristics

Measure	Definition
Demographic and personal characteristics	
Age	Continuous variable for age at baseline; ranges from 15 to 19
Three or more years younger than baby's father	Binary variable: equals 1 if participant is 3 or more years younger than the baby's father based on reported ages for both the baby's father and the participant; equals 0 if the participant is not 3 or more years younger than the baby's father
Race/ethnicity	Categorical variable with categories for (1) Latina, (2) non-Latina black, (3) non-Latina white, and (4) non-Latina "other" race
Language spoken at home	Categorical variable with categories for (1) English, (2) Spanish, and (3) Both English and Spanish
Household structure:	
Lives with mother	Binary variable: equals 1 if participant reported living with biological mother or mother figure; equals 0 if participant reported not living with her mother
Lives with father	Binary variable: equals 1 if participant reported living with biological father or father figure; equals 0 if participant reported not living with her father
Lives with both mother and father	Binary variable: equals 1 if participant reported living with biological mother or mother figure and biological father or father figure; equals 0 if participant reported that at least one parent is not in the home
School or work status	Binary variable: equals 1 if participant reported attending school or working; equals 0 if participant reported not attending school and not working
Behind grade level	Binary variable: equals 1 if participant is behind a grade level based on date of birth and last grade level completed; equals 0 if the participant was not behind a grade level
Highest grade level of education would like to complete	Categorical variable with categories for (1) graduate from high school, (2) some technical or vocational training, (3) graduate from a 2-year college, (4) graduate from a 4-year college, (5) obtain a graduate degree, and (6) other
Relationship with baby's father at survey	Categorical variable with categories for (1) married, (2) living together but not married, (3) dating but not living together, and (4) not in a relationship
Mother was a teen mother	Binary variable: equals 1 if participant reported that her mother was a teen mother; 0 if participant reported that her mother was not a teen mother
At least half of friends have been pregnant	Binary variable: equals 1 if participant reported that at least half of her friends who are her age have been pregnant; equals 0 if participant reported that less than half of her friends have been pregnant
At least half of friends have been a teen parent	Binary variable: equals 1 if participant reported that at least half of her friends who are her age have been a teen parent; equals 0 if participant reported that less than half of her friends have been a teen parent
Attitudes	
General support for methods of protection	Continuous scale variable: average of responses to three survey questions; variable ranges from 1 to 5, with higher values indicating stronger support
Perceived barriers to methods of protection	Continuous scale variable: average of responses to two survey questions; variable ranges from 1 to 5, with higher values indicating fewer perceived barriers

TABLE B.1. *(CONTINUED)*

Measure	Definition
Intentions	
If having sexual intercourse in the next year:	
Intends to use a condom	Binary variable: equals 1 if participant reported intending to use a condom if she has sexual intercourse; equals 0 if participant reported less intention
Intends to use a LARC	Binary variable: equals 1 if participant reported intending to use a LARC if she has sexual intercourse; equals 0 if participant reported less intention
Intends to use an effective contraceptive method	Binary variable: equals 1 if participant reported intending to use an effective contraceptive method if she has sexual intercourse; equals 0 if participant reported less intention
Sure she will not be pregnant again before child turns 2	Binary variable: equals 1 if participant reported that she is sure she will not be pregnant again before her child is 2 years old; equals 0 if participant reported that she is less than sure she will not be pregnant again before her child is 2 years old
Sexual risk behavior	
Age at first sexual intercourse	Continuous variable for age when first had sexual intercourse; ranges from 9 to 18
Number of sexual partners	Count variable indicating the total number of sexual partners the participant has ever had; ranges from 1 to 30
Pregnant more than once	Binary variable: equals 1 if participant reported having more than one pregnancy; equals 0 if participant reported having one pregnancy
Trying to get pregnant when got pregnant with baby	Binary variable: equals 1 if participant reported trying to get pregnant when got pregnant with baby; equals 0 if participant reported not trying to get pregnant when got pregnant with baby
In the past four weeks:	
Had sexual intercourse	Binary variable: equals 1 if participant reported having sexual intercourse in the four weeks before completing the baseline survey; equals 0 if participant reported not doing so
Had sexual intercourse without a condom	Binary variable: equals 1 if participant reported having sexual intercourse without using a condom at least once in the four weeks before completing the baseline survey; equals 0 if participant reported not doing so
Had sexual intercourse without a LARC	Binary variable: equals 1 if participant reported having sexual intercourse without using a LARC in the four weeks before completing the baseline survey; equals 0 if participant reported not doing so
Had unprotected sexual intercourse	Binary variable: equals 1 if participant reported having sexual intercourse without using an effective contraceptive method in the four weeks before completing the baseline survey; equals 0 if participant reported not doing so

APPENDIX C

24-MONTH IMPACTS ON MEDIATING FACTORS

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In this appendix, we estimate the 24-month impacts of the *AIM 4 Teen Moms* program on four types of intermediate or potential "mediating" outcomes: (1) exposure to information on contraceptive methods, (2) attitudes toward safe sex and methods of protection, (3) intentions to avoid unprotected sexual activity, and (4) educational aspirations. As discussed in Chapter I, we analyzed these outcomes in our earlier interim report using data from the 12-month follow-up survey (Covington et al. 2015). The results of that analysis found statistically significant impacts of the program on participants' exposure to information on LARC use but no statistically significant impacts on other measures on intermediate outcomes at the time of the 12-month follow-up survey. In this appendix, we examine the program's longer-run impacts on these same outcomes using data from the 24-month follow-up survey. We estimated the impacts using the same multivariate regression framework described earlier in Chapter III. See the earlier interim report for a more detailed description of the measures (Covington et al. 2015).

A. Exposure to information on contraceptive methods

Drawing on data from the 24-month follow-up survey, we did not find statistically significant program impacts on participants' exposure to information on contraceptive methods (Table C.1). Participants in the treatment group were just as likely as those in the control group to report having received information on any of the birth control methods that we examined. This finding may be in part due to the fact that the *Aim 4 Teen Moms* program sessions had ended more than a year before the administration of the 24-month follow-up survey. The relatively high rates of exposure in both treatment and control group participants likely reflect participants' access to the array of health services available to teen mothers in Los Angeles County. In general, these results are slightly lower but consistent with our interim report findings. The lower numbers could reflect that some of the women were no longer receiving the services they were offered as a new teen mother by the time of the 24-month survey, when the median age of the first child was 27 months.

Similarly, there are no significant differences in the source from which the women obtained the information, whether it was from a home visit, clinic appointment, or the hospital. Again, this finding is unsurprising because we administered the 24-month follow-up survey roughly 20 months after the *AIM 4 Teen Moms* program had already ended for participants in the treatment group. As evidence of this, we found that women in the treatment and control groups were equally likely to receive services available to teen mothers in the year before the 24-month follow-up survey.

B. Attitudes, intentions, and aspirations

We found no statistically significant differences in the measures of attitudes, intentions, or aspirations (Table C.2). These results are similar to what we found in the interim report. For each of the five attitude measures examined, the reported differences between the treatment and control groups were small and not statistically significant. The proportion of participants who reported intentions to have sex, have sex using LARCs, have sex using condoms, or have sex using other types of birth control (not including condoms) in the next 12 months were likewise similar across treatment and control groups.

Table C.1. Impacts on exposure to information on contraceptive methods

Measure[a]	Treatment group	Control group	Difference	*p*-value
Percentage of women who reported receiving information on the following topics in the past 12 months:				
Implant (Implanon)	76.3	72.4	4.0	>0.99
IUD (Mirena or Paragard)	79.3	75.9	3.4	>0.99
The shot (Depo-Provera)	77.5	75.3	2.2	>0.99
The patch	77.9	73.0	4.9	>0.99
The ring (NuvaRing)	78.1	74.0	4.2	>0.99
Condoms	80.8	78.6	2.2	>0.99
Birth control pills	80.1	76.8	3.3	>0.99
Methods of birth control	81.1	77.4	3.8	>0.99
Where to obtain birth control	82.0	80.7	1.3	>0.99
Percentage of women who reported receiving information about birth control from each of the following sources:				
Home visit from a nurse, social worker, or other health care professional	20.3	12.4	7.8	0.24
Clinic appointment with a doctor, nurse, or other health professional	72.3	77.9	-5.7	>0.99
Hospital	14.5	19.0	-4.5	>0.99

Source: Baseline and follow-up surveys administered.

Notes: For each outcome, the numbers in the columns labeled “Treatment group” and “Control group” are regression-adjusted predicted values of outcomes at the 12-month follow-up survey. Sample sizes accounting for item nonresponse range from 509 to 530, depending on the measure. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. Chapter III contains a more detailed description of the analytic methods.

[a] Questions refer to information received in the 12 months before survey administration.

Table C.2. Impacts on attitudes, intentions, and aspirations

Measure	Treatment group	Control group	Difference	*p-value*
Percentage of women reporting they "strongly agree" that:				
Birth control should always be used when someone their age has sexual intercourse	56.5	54.0	2.5	>0.99
Birth control is a hassle	10.3	8.6	1.6	>0.99
Birth control is pretty easy to get	52.2	47.6	4.6	>0.99
Birth control is important to make sex safer	55.1	52.5	2.6	>0.99
Birth control has too many negative side effects	11.7	14.0	-2.4	>0.99
Percentage of women reporting intentions to engage in the following behaviors in the next 12 months:				
Have sexual intercourse	77.2	81.1	-3.9	>0.99
Use a LARC if having sex[a]	39.4	39.6	-0.3	>0.99
Use a condom if having sex	79.3	79.4	-0.1	>0.99
Use protection method other than a condom if having sex[b]	79.5	83.0	-3.4	>0.99
Percentage of women that expect to:				
Attend any schooling after high school	73.9	70.1	3.8	0.63
Graduate from a 4-year college	48.8	40.1	8.7	0.09

Source: Baseline and follow-up 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 24-month follow-up survey. Sample sizes accounting for item nonresponse range from 496 to 527, 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.

[a] Includes the following contraceptive methods: IUD (Mirena or Paragard) or implant (Implanon).

[b] Includes the following contraceptive methods: birth control pills, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), or implant (Implanon).

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APPENDIX D

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 five types of sensitivity tests:

- **Coding of the outcome measure.** As discussed in greater detail in Chapter III, we coded our primary measure of repeat pregnancy taking into account a participant's responses to survey questions from both the 12- and 24-month follow-up surveys. For example, if a woman reported having had a repeat pregnancy on the 12-month survey but did not respond to the repeat pregnancy question on the 24-month survey, we imputed her response for the 24-month survey as having had a repeat pregnancy. If a woman reported having had a repeat pregnancy on the 12-month survey but then contradicted this response on the 24-month survey by reporting not having had a repeat pregnancy, we examined her responses to other pregnancy-related questions on the 12-month survey to determine the legitimacy of her reporting on the 12-month survey. Because of the importance of this outcome for our analysis, we checked the sensitivity of our results to these coding decisions by creating three alternative versions of the same outcome. We describe the details of these alternative versions in Chapter III.
- **Specification of the regression model.** For the main findings presented in Chapter IV, we specified the regression models using logistic regression for binary variables and ordinary least squares (OLS) regression for continuous variables. Each regression model included the following covariates: (1) a binary indicator for treatment status, (2) binary indicator variables for each of the strata created for random assignment, (3) two key demographic variables that are highly correlated with our key outcomes of interest (age and race), (4) a continuous variable measuring the number of months between administration of the baseline and follow-up surveys, (5) the baseline measure of the outcome (if available), and (6) an additional set of baseline covariates that were empirically selected through a data-driven forward selection procedure. To test the sensitivity of our results to an alternative specification, we estimated comparable models using OLS regression for binary variables (for example, repeat pregnancy) and Poisson regression for count variables (for example, number of pregnancies). We also tested the sensitivity of our results to alternative combinations of covariates—(1) excluding any covariates identified through the data-driven forward selection procedure, (2) controlling only for random assignment strata with no additional covariates, and (3) dropping the control variable measuring the number of months between the baseline and follow-up survey administration dates.
- **Threshold for covariate selection procedure.** As described in Chapter III, we selected some of the baseline covariates through a previously developed data-driven forward stepwise procedure found in the literature (Social and Character Development Research Consortium 2010). At each step of the stepwise procedure, we included the variable with the smallest *p*-value below a preset threshold level in the model, whereas we evaluated the variables already selected to see if any could be removed. Also, we removed any variable with a *p*-value greater than the critical value of 0.32 and whose removal would least lower the adjusted R^2. We set the critical *p*-value 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. For a sensitivity test, we selected covariates using alternative values of 0.20 and 0.10 as the threshold *p*-value.

- **Method for estimating *p*-values.** For the main findings presented in Chapter IV of this report, we adjusted the statistical significance tests (*p*-values) to account for multiple hypothesis testing within domain, using a procedure outlined by Hothorn et al. (2008) and Schochet (2009). To examine the sensitivity of our results to these adjustments, we estimated comparable regression models without adjustment for multiple comparisons.
- **Alternative reference period for contraceptive use measures.** For the main findings presented in Chapter IV, we used a 3-month reference period to measure rates of unprotected sex without different types of contraceptive methods. We used a 3-month period in part because reporting sexual behaviors over such a relatively short period has been found to increase the validity of these types of self-reported data (Jemmott et al. 1998; Kauth et al. 1991). To examine the sensitivity of our results to an alternative reference period, we constructed a comparable set of outcomes using a longer (12-month) reference period.

The results of these analyses (Tables D.1–D.3) showed that our findings generally remain similar when using these alternative analytic decisions. For our primary measure of repeat pregnancy, the direction is consistent between our main findings as presented in Chapter IV and each of the sensitivity tests we conducted (Table D.1). However, statistical significance is sensitive to changes in the covariate selection procedure. In particular, the difference in rates of repeat pregnancy is statistically significant at the 5-percent level when lowering the threshold *p*-value from 0.32 to 0.20 or 0.10. For the other pregnancy-related outcomes—new birth and number of pregnancies since the birth of the first child—the direction and magnitude of the impact estimate is again consistent between our main findings presented in Chapter IV and each of the sensitivity tests. None of the impacts reaches statistical significance in any of the sensitivity tests we conducted.

Our findings are similar for the measures of sexual risk behaviors and contraceptive use (Tables D.2 and D.3). The direction, magnitude, and statistical significance of the impact estimates for the sexual risk behavior outcomes—unprotected sex in the past three months, sexual intercourse in the past three months, and number of sexual partners in the past 12 months—are consistent with our main findings reported in Chapter IV (Table D.2). None of the impact estimates reaches statistical significance for any of the outcomes.

When examining the measures of contraceptive use, the impact estimates across all tests are also consistent with our main findings presented in Chapter IV (Table D.3). The magnitude of the impact estimates are similar to those presented in Chapter IV; none of the estimates reaches statistical significance.

Table D.1. Sensitivity of impacts on pregnancy outcomes

	Repeat pregnancy		New birth		Number of pregnancies	
	Impact	*p*-value	Impact	*p*-value	Impact	*p*-value
Main findings[a]	-7.5	0.07	0.9	> 0.99	-0.1	0.53
Alternative coding of outcome:						
Alternative 1	-3.2	0.41				
Alternative 2	-5.7	0.17				
Alternative 3	-5.5	0.18				
Specification of regression model:						
OLS or Poisson model	-7.0	0.08	0.7	>0.99	-0.1	0.56
Excluding covariates identified through stepwise procedure	-6.9	0.09	0.6	>0.99	-0.1	0.49
Controls only for treatment and neighborhood strata	-4.9	0.23	1.2	>0.99	0.0	0.77
No control for months between surveys	-7.5	0.07	1.1	>0.99	-0.1	0.50
Threshold for covariate selection:						
p-value = 0.2	-8.0	0.05*	0.3	>0.99	-0.1	0.36
p-value = 0.1	-8.7	0.03*	-0.8	>0.99	-0.1	0.31
Method for estimating *p*-values:						
Ignore multiple comparisons	-7.5	0.07	0.9	0.75	-0.1	0.27

Source: Surveys administered to study participants by the evaluation team.

Note: For each outcome, the numbers in the impact columns represent the difference between regression-adjusted predicted values of outcomes at the 24-month follow-up survey between treatment and control groups. Reported *p*-values are adjusted for multiple outcomes measured within a single domain unless otherwise stated. See Chapter III for a more detailed description of the analytic methods.

[a] The main findings denote the impact estimates presented in Chapter IV of this report.

* Significantly different from zero at the .05 level.

Table D.2. Sensitivity of impacts on sexual risk behaviors

	Had unprotected sex		Had sex		Number of sexual partners	
	Impact	*p*-value	Impact	*p*-value	Impact	*p*-value
Main findings[a]	3.3	0.41	-3.8	0.65	0.0	> 0.99
Specification of regression model:						
OLS or Poisson model	3.5	0.36	-4.1	0.58	0.0	> 0.99
Excluding covariates identified through stepwise procedure	4.2	0.27	-4.5	0.49	0.0	> 0.99
Controls only for treatment and neighborhood strata	4.7	0.22	-4.0	0.62	0.0	> 0.99
No control for months between surveys	3.4	0.40	-3.9	0.63	0.0	> 0.99
Threshold for covariate selection:						
p-value = 0.2	2.6	0.50	-4.6	0.48	0.0	> 0.99
p-value = 0.1	2.7	0.49	-4.4	0.51	0.0	> 0.99
Method for estimating *p*-values:						
Ignore multiple comparisons	3.3	0.41	-3.8	0.32	0.0	0.74

Source: Surveys administered to study participants by the evaluation team.

Note: For each outcome, the numbers in the impact columns represent the difference between regression-adjusted predicted values of outcomes at the 24-month follow-up survey between treatment and control groups. Reported *p*-values are adjusted for multiple outcomes measured within a single domain unless otherwise stated. See Chapter III for a more detailed description of the analytic methods.

[a] The main findings denote the impact estimates presented in Chapter IV of this report.

Table D.3. Sensitivity of impacts on contraceptive use

	Had sex without											
	Any LARC		Condom		Birth control pills		The shot		The patch		The ring	
	Impact	*p*-value	Impact	*p*-value	Impact	*p*-value	Impact	*p*-value	Impact	*p*-value	Impact	*p*-value
Main findings[a]	0.2	> 0.99	0.6	> 0.99	-1.7	> 0.99	-4.2	> 0.99	-1.6	> 0.99	-3.3	> 0.99
Specification of regression model:												
OLS or Poisson model	0.5	> 0.99	0.9	> 0.99	-1.8	> 0.99	-4.2	> 0.99	-1.8	> 0.99	-3.5	> 0.99
Excluding covariates identified through stepwise procedure	1.9	> 0.99	1.6	> 0.99	0.4	> 0.99	-2.6	> 0.99	-1.5	> 0.99	-2.7	> 0.99
Controls only for treatment and neighborhood strata	2.7	> 0.99	0.9	> 0.99	0.7	> 0.99	-2.6	> 0.99	-1.3	> 0.99	-2.4	> 0.99
No control for months between surveys	0.3	> 0.99	0.6	> 0.99	-1.7	> 0.99	-4.2	> 0.99	-1.6	> 0.99	-3.3	> 0.99
Threshold for covariate selection:												
p-value = 0.2	0.4	> 0.99	-0.5	> 0.99	-2.2	> 0.99	-4.2	> 0.99	-2.0	> 0.99	-3.7	> 0.99
p-value = 0.1	0.5	> 0.99	0.0	> 0.99	-2.1	> 0.99	-4.1	> 0.99	-1.9	> 0.99	-3.6	> 0.99
Using 12 months as the reference period instead	-0.3	> 0.99	-5.4	> 0.99	0.8	> 0.99	-3.0	> 0.99	1.0	> 0.99	-1.4	> 0.99
Method for estimating *p*-values:												
Ignore multiple comparisons	0.2	0.96	0.6	0.90	-1.7	0.67	-4.2	0.30	-1.6	0.67	-3.3	0.39

Source: Surveys administered to study participants by the evaluation team.

Note: For each outcome, the numbers in the impact columns represent the difference between regression-adjusted predicted values of outcomes at the 24-month follow-up survey between treatment and control groups. Reported *p*-values are adjusted for multiple outcomes measured within a single domain unless otherwise stated. See Chapter III for a more detailed description of the analytic methods.

[a] The main findings denote the impact estimates presented in Chapter IV of this report.

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