Evaluation of Adolescent Pregnancy Prevention Approaches

OAH Evaluation Report

Impact Report from the Evaluation of Adolescent Pregnancy Prevention Approaches

Interim Impacts of the AIM 4 Teen Moms Program

December 2015

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Purpose statement: This study reports interim 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 interim impacts of the program on contraceptive use behaviors and rates of unprotected sex measured about a year after the mother had enrolled in the study. The report also examines program impacts on school enrollment or employment status, educational aspirations, and attitudes and intentions regarding contraceptive use. A future report will examine the program's longer-term impact on repeat pregnancy rates.

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I. INTRODUCTION

In 2009, staff at Children's Hospital Los Angeles (CHLA) recognized a need for new approaches to reducing repeat pregnancies among teen mothers in Los Angeles County. California, like the rest of the United States, has seen significant declines in teen birth rates in recent years. From 2000 to 2012, the teen birth rate in California dropped by more than 40 percent (California Department of Public Health 2014). However, with a large and growing population, the state still records more than 30,000 teen births every year (California Department of Public Health 2014). Of these, nearly one in five are repeat pregnancies—which are particularly common among adolescents, the result of a combination of biological factors and inconsistent or ineffective contraceptive use (Baldwin 2013). More widespread use of highly effective "user independent" or long-acting reversible contraception (LARC) methods—namely, contraceptive implants and intrauterine devices (IUDs)—offers the potential to greatly improve the consistency of contraceptive use and reduce the number of unintended repeat pregnancies to adolescents (American College of Obstetricians and Gynecologists 2012). To date, however, use of these methods remains relatively low. Among female teenagers in the United States who report having had sexual intercourse at least once, only 3 percent have ever used an IUD, and only 2 percent have ever used a hormonal implant (Martinez and Abma 2015).

To address these needs, staff at CHLA launched *AIM (Adult Identity Mentoring) 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 program is adapted from an existing teen pregnancy prevention program called *Project AIM* (Clark et al. 2005), which features a structured curriculum delivered to program participants in nine sessions spread over roughly 12 weeks. Most of the sessions are delivered to participants in their own homes during one-on-one meetings with trained program staff members, called *advisors.* Through a mix of interactive discussions and skill-building activities, the program encourages teen mothers to envision positive futures for themselves and to identify the practical steps necessary to achieve their long-term goals. In doing so, the program also provides teen mothers with detailed information on a full range of contraceptive methods, including LARCs. The program encourages teen mothers to consider the pros and cons of different contraceptive methods and identify those that best align with their long-term aspirations and goals.

This report is the second in a series of planned reports and articles documenting findings from a large-scale demonstration project and random assignment evaluation of the *AIM 4 Teen Moms* program. The evaluation involves a large sample of more than 900 new teen mothers in Los Angeles County. In the first report, Asheer and Kisker (2014) described findings from an in-depth implementation study of the program. For this second report, we examine the interim impacts of the program on contraceptive use behaviors and rates of unprotected sex measured about a year after the mothers had enrolled in the study—or roughly nine months after participants were to complete the last program session. The report also examines program impacts on a subset of shorter-term or potential "mediating" outcomes: exposure to information on reproductive health topics and contraceptive methods, school enrollment or employment status, educational aspirations, and attitudes and intentions toward contraceptive use. Future reports and articles will use data from a longer-term 24-month follow-up survey to examine the program's impacts on repeat pregnancy rates, as well as outcomes related to its positive youth development theoretical model.

The evaluation involved a unique collaboration and partnership among several organizations. It was originally designed by staff and faculty at CHLA in collaboration with researchers from ETR, a California-based nonprofit health and education organization. In fall 2010, CHLA was awarded competitive federal grant funding for the demonstration program through the Family and Youth Services Bureau within the Administration for Children and Families of the U.S. Department of Health and Human Services (HHS). In winter 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 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 discuss the background and context of the evaluation and describe the program in detail. Chapters II and III provide detailed information on the study design, data, and analytic methods. Chapter IV presents findings from the interim impact analysis, and Chapter V summarizes and discusses the implications of the results.

A. Background and context

For the purposes of this demonstration project and evaluation, CHLA initially sought to implement *AIM 4 Teen Moms* primarily in three targeted areas of Los Angeles County (Table I.1). The largest number of eligible participants came from South Los Angeles, a high-risk area of the county with a predominantly Latino and African American population. Rates of family poverty, teen births, and sexually transmitted infections are all higher in South Los Angeles than in other parts of the county. About half the residents were born outside the United States. The two other targeted service areas were Metropolitan Los Angeles, a predominantly Latino area encompassing neighborhoods in and around the city's central business district, and the San Fernando Valley, a geographically large and socioeconomically diverse area encompassing most of the northwestern portion of Los Angeles County. Metropolitan Los Angeles is similar to South Los Angeles in having higher rates of teen births and family poverty than the county as a whole. Collectively, the San Fernando Valley has a relatively lower teen birth rate and is less economically disadvantaged than the county as a whole; however, CHLA focused specifically on the northeast region of the San Fernando Valley, which contains a large concentration of low-income teen mothers at risk for a repeat pregnancy, poor school outcomes, and other health risks. Later, CHLA broadened their outreach effort to include other areas of Los Angeles County: Long Beach and East Los Angeles. However, the majority of eligible participants came from the initial targeted areas of South Los Angeles, Metropolitan Los Angeles, and the San Fernando Valley.

Within these areas, the program served a predominantly low-income, Latina population—a group with distinct relationship dynamics and health risk behaviors. Since the late 1990s, Latinas have had the highest teen birth rates of all major racial/ethnic groups in the United States

(Ventura et al. 2014). In California, Latinas make up about half the female adolescent population but account for three-fourths of all teen births (California Department of Public Health 2014). However, recent research suggests that many of these births occur within the context of relatively long-term, monogamous relationships. For example, data from the National Longitudinal Study of Adolescent Health show that the most common pattern of sexual risk behavior among Latina adolescents and young adults is defined by low or inconsistent contraceptive use with a single, steady partner (Pflieger et al. 2013). The same data show that comparatively few Latinas report patterns of sexual risk behavior defined by high numbers of concurrent sexual partners or the very early onset of sexual activity. Similarly, data from the 2013 Youth Risk Behavior Survey show that Latinas are less likely than female youth of other racial/ethnic groups to report having used a condom the last time they had sex (Centers for Disease Control and Prevention 2013). Taken together, these findings suggest that the high teen birth rates among Latinas owe more to contraceptive use behaviors than to unstable relationships or early engagement in sexual risk behaviors. Despite these differences, however, Latinas are similar to women from other racial/ethnic groups in describing the majority of nonmarital births as unintended (Mosher et al. 2012).

Table I.1. Characteristics of initial target areas

Characteristic	South Los Angeles	Metropolitan Los Angeles	San Fernando Valley
Percentage Latino	67.7	52.2	39.1
Percentage African American	28.5	4.7	3.4
Percentage white	2.0	24.9	45.9
Percentage of adults born outside the United States	50.2	55.1	45.0
Percentage of children born outside the United States	5.8	10.9	8.5
Percentage of adults with less than a high school education	38.3	27.6	19.1
Percentage of population with household incomes less than 100% of federal poverty level	31.1	25.0	15.0
Teen birth rate (live births per 1,000 females aged 15-19)	51.1	35.5	18.9
Incidence of chlamydia (annual new cases per 100,000 population)	999.5	587.7	320.5
Incidence of gonorrhea (annual new cases per 100,000 population)	231.9	204.7	57.9

Source: Los Angeles County Department of Public Health (2013).

Research also suggests that Latinas have distinct views on the issues of pregnancy and contraceptive use (Aiken et al. 2013; Hartnett 2012; Hayford et al. 2013). Similar to adolescents and young adults from other racial/ethnic groups, the vast majority of Latinas express strong support for avoiding unplanned pregnancy and for the use of effective contraceptive methods (Moore et al. 2013). However, Latinas are more likely than women from other racial/ethnic groups to say they would embrace and feel happy about an unplanned pregnancy if one happened

to occur (Guzman et al. 2013). Indeed, a recent study of unmarried Latina and Latino young adults found that a majority would feel more pleased than upset by an unplanned pregnancy (Hayford et al. 2013). Although some researchers have characterized these findings as revealing greater ambivalence among Latinas toward unplanned pregnancy, recent studies instead suggest that unique social and cultural norms make Latinas more likely than women of other racial/ethnic groups to view pregnancy "intentions" and projected feelings of "happiness" as two distinct concepts that do not necessarily go hand in hand (Aiken et al. 2013).

Another important contextual factor for the evaluation concerns the availability of other support services. 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 teen mothers 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. The program was temporarily suspended in 2011 because of state budget cuts but was later restored beginning in 2012 and early 2013. California's Adolescent Family Life Program (AFLP) provides additional case management, home visiting, and support services to 3,000 expectant and parenting teens annually 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 defined sequence and a well-defined theoretical model. As documented in the earlier implementation report (Asheer and Kisker 2014), the program was designed to supplement, not replace, the more loosely connected network of existing programs and services available to teen mothers in these areas.

B. The *AIM 4 Teen Moms* program

AIM 4 Teen Moms was adapted from an existing teen pregnancy prevention effort called *Project AIM*—a classroom-based program that has shown promise in reducing sexual risk behaviors among at-risk middle school students. The original *Project AIM* consists of twelve 50-minute sessions delivered by trained teachers or facilitators to small groups of youth in schools or other classroom settings. 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 to adopt health-promoting behaviors. *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 study found that youth offered the program reported lower rates of sexual activity than youth who received the standard school health curriculum. On the basis of these results, *Project AIM* was recognized by HHS as an evidence-based approach to teen pregnancy prevention and made available for broader dissemination. 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, most of the sessions were switched from a facilitator-led, group-based format to a more individualized, one-on-one meeting in the participant's home. This change was necessary 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 adapted the content of each session to address the target population of *AIM 4 Teen Moms*. The adapted sessions retain the program's core emphasis on positive youth development, planning for the future, and the promotion of healthy lifestyles and behaviors; however, participants apply these concepts in the context of topics of particular relevance to teen mothers, such as birth spacing, future reproductive planning, and parenting ideals. Our accompanying implementation study describes the program adaptation process in detail (Asheer and Kisker 2014).

As a result of this adaption, 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.2). 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 to give participants an opportunity to receive feedback and support from a network of peers.

Table I.2. *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 career interest inventory to identify career aspiration
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 aspiration; revisit reproduction 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

TABLE I.2. *(CONTINUED)*

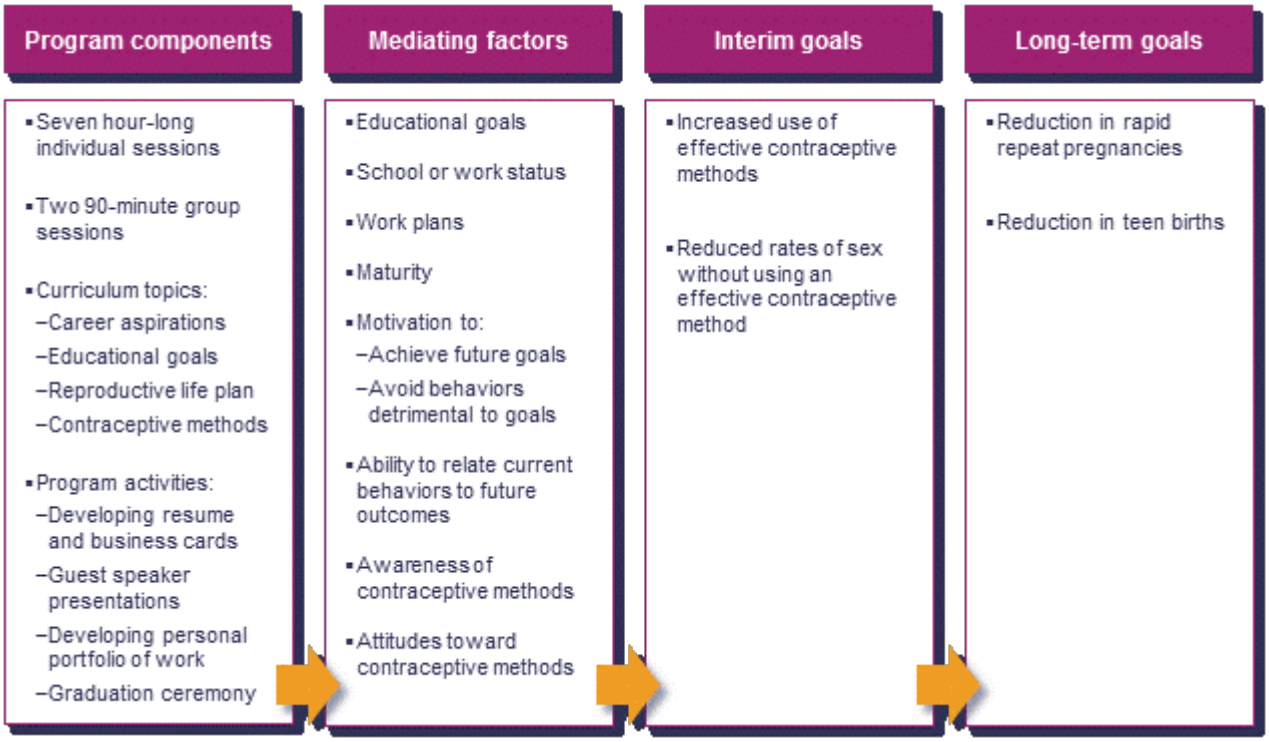
Session	Title	Purpose
Group 2	Dinner Celebration	Inspirational speaker; letter of recommendations for future career; what *AIM 4 Teen Moms* means to me

The sessions involve a sequenced series of activities designed to build on the life experiences of program participants 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 to focus on for the purposes of the program. In later sessions, participants work with their advisors on writing resumes, drawing time lines, 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 discussion, 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 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. The first group session provides instruction on correct condom use. 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 directly provide participants with contraceptives, 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, since 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 obtaining their preferred contraceptive methods.

Through these activities, the program seeks to influence a broad range of outcomes (Figure I.1). In the short run, its interim goals are to increase the use of effective contraceptive methods and reduce rates of unprotected sex. The program aims to achieve these goals through a range of potential intermediate or mediating factors—for example, encouraging participants to think about their future educational and career aspirations, motivating them to pursue their aspirations, and providing them with the information needed to make informed decisions about effective contraceptive methods. In the longer run, increased use of effective contraceptive methods and resulting reduced rates of unprotected sex should lead to fewer repeat pregnancies and teen births.

Figure I.1. *AIM 4 Teen Moms* program logic model



C. Research questions

This is the first in a series of planned reports and articles assessing the impacts of *AIM 4 Teen Moms* on participant outcomes. We begin by examining the interim impacts of the program on contraceptive use behaviors and rates of unprotected sex measured roughly one year after the mothers had enrolled in the study. We also examine program impacts on a subset of shorter-term or potential mediating outcomes: exposure to information on reproductive health topics and contraceptive methods, school enrollment or employment status, educational aspirations, and attitudes and intentions regarding contraceptive use. Future reports and articles will examine the program's longer-term impacts on repeat pregnancy rates, as well as outcomes related to the program's positive youth development theoretical model. As discussed earlier in this chapter, because of the broad range of existing programs and services available to teen mothers in Los Angeles County, all our planned research questions and analyses involve assessing the effectiveness of *AIM 4 Teen Moms* as a supplement to existing programs and services.

To assess the interim impacts of the program on contraceptive use behaviors and rates of unprotected sex, this report focuses first on two research questions:

1. Is *AIM 4 Teen Moms* successful in reducing rates of unprotected sexual activity?
2. Does *AIM 4 Teens Moms* affect the use of different types of contraceptive methods?

We also assess the impacts of *AIM 4 Teen Moms* on two other key sexual risk behaviors: overall sexual activity rates and number of sexual partners. These outcomes are not directly targeted by the program and do not appear in the program logic model (Figure I.1). However,

given its emphasis on promoting the use of highly effective contraceptive methods, such as LARCs, the program may have unintended spillover effects on these other risk behaviors. For example, participants may report higher rates of sexual activity or an increased number of sexual partners after they have reduced their pregnancy risk through the use of LARCs. We test for these potential spillover effects through the following research question:

- Does *AIM 4 Teen Moms* affect sexual risk behaviors less directly targeted by the program—namely, overall sexual activity rates and number of sexual partners?

Finally, to begin examining the potential pathways or mechanisms through which the program might influence contraceptive use or sexual risk behaviors, we assess impacts on several outcomes aligned with a subset of mediating factors specified in the logic model. We explore program impacts on these potential mediating outcomes through several research questions:

1. Do teen mothers who participate in *AIM 4 Teen Moms* report increased exposure to information on effective contraceptive methods?
2. Are teen mothers who participate in *AIM 4 Teen Moms* more engaged in school or work and increasing their educational aspirations?
3. Do teen mothers who participate in *AIM 4 Teen Moms* report more favorable attitudes toward safe sex and the use of effective contraceptive methods?
4. Are teens who participate in *AIM 4 Teen Moms* more likely to report intentions to avoid unprotected sexual activity and repeat pregnancy?

II. STUDY DESIGN

The study was designed 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, about half were randomly assigned to a treatment group that was offered the *AIM 4 Teen Moms* program, and half were assigned 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 calculated interim impacts of the program by comparing outcomes between the treatment and control groups about 12 months after study enrollment.

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. The next chapter describes the data, measures, and analytic methods used to estimate the impacts.

A. Sample enrollment and retention

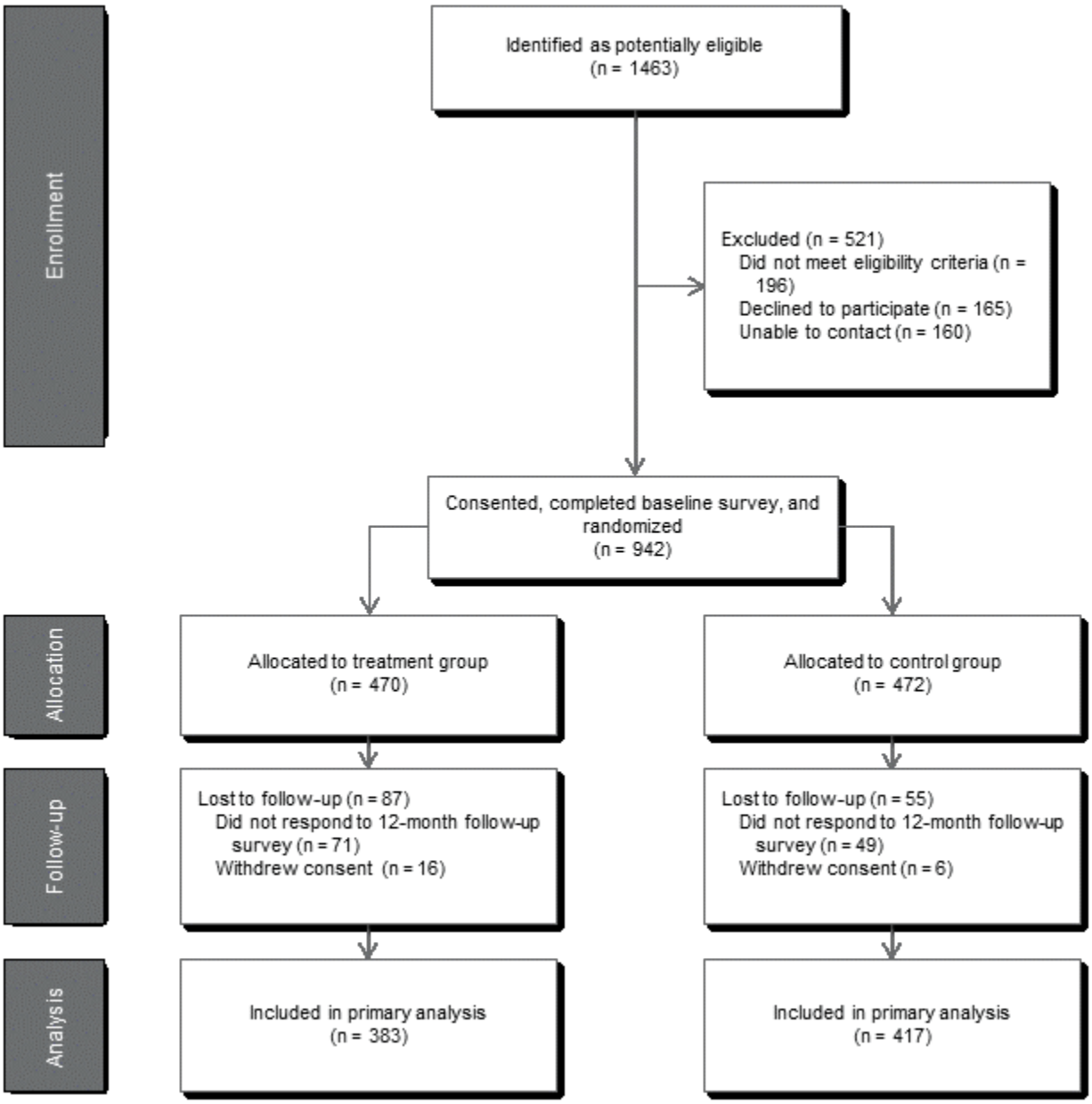
The study sample comprises low-income, newly parenting adolescent mothers in Los Angeles County. Participants were recruited primarily through referrals from community-based programs already serving teen mothers, outreach activities at local schools and health fairs, referrals from schools that serve 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 to 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 aged 15 to 19 with one child from 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 each eligible participant a caseworker. The caseworkers collected active consent for participation and scheduled a time to administer a baseline study survey. In most cases, consent was gathered at the women's residences, which allowed baseline data to be collected at the same time as consent. Participants had to provide active consent and complete the baseline survey to be 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 were considered 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 ensure an even balance of participants across the treatment and control groups throughout the study period (Matts and Lachin 1988; Schulz 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). A total of 1,463 adolescents were identified as potentially eligible, but 521 (36 percent) were excluded, 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, roughly half (470) were randomized to the treatment group, and half (472) to the control group.

There was a modest difference in study retention rates between the treatment and control groups (Figure II.1). The present report focuses on data from the first follow-up survey, which was administered to participants beginning 12 months after study enrollment. Among the 470 women in the treatment group, 81 percent (383) completed the 12-month follow-up survey and are included in the analysis sample. Among the 472 women assigned to the control group, 88 percent (417) completed the 12-month follow-up survey and are 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 group, 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 could 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. 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 biases our results. Such differences 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 12-month follow-up survey and are thus excluded from our analysis. We will report retention rates for a longer-term (24-month) follow-up survey as part of a future impact report.

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.

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 1 in 3 participants were 16 years old or younger. Consistent with the eligibility criteria, nearly 70 percent of the participants gave birth within three months prior to completing the baseline survey, and 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 is Latina, and just over 10 percent is black. Almost 70 percent of the sample reported that they usually speak Spanish when at home or with their family. Over 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 nearly 4 in 10 of them were behind 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 4-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	12.6	11.8	0.8	0.79
16	23.3	22.5	0.8	
17	28.3	31.4	-3.1	
18+	35.9	34.3	1.6	
Child's age (%)				
1-3 months	68.1	66.1	2.0	0.81
4-6 months	30.1	32.2	-2.1	
7-12 months	1.8	1.7	0.1	
Race/ethnicity (%)				
Latina	84.1	85.6	-1.5	0.80
Black	11.4	11.2	0.2	
White	1.3	1.0	0.3	
Other	3.2	2.2	1.0	
Language spoken at home (%)				
English	28.1	27.3	0.8	0.15
Spanish	17.8	23.3	-5.5	
Both English and Spanish	54.1	49.4	4.7	
Household structure (%)				
Lives with mother	78.8	74.8	4.0	0.18
Lives with father	30.6	31.5	-0.9	0.79
Lives with both mother and father	28.5	28.8	-0.3	0.92
Enrolled in school or currently working (%)	86.2	86.9	-0.7	0.77
Behind grade level (%)	35.6	40.6	-5.0	0.14
Highest level of education would like to complete (%)				
Graduate from high school	16.9	24.5	-7.6	0.08
Some technical or vocational training	3.7	3.6	0.1	
Graduate from a 2-year college	23.0	19.2	3.8	
Graduate from a 4-year college	33.8	30.0	3.8	
Obtain a graduate degree	19.5	20.9	-1.4	
Other	3.2	1.7	1.5	
Relationship with baby's father (%)				
Married	1.1	2.5	-1.4	0.51
Living together but not married	21.3	20.6	0.7	
Dating but not living together	43.6	42.3	1.3	
Not in a relationship	34.0	34.6	-0.6	
Mother was a teen mother (%)	51.9	54.7	-2.8	0.80
At least half their friends are teen parents (%)	23.2	23.8	-0.6	0.85
Sample size[b]	**383**	**417**		

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

[a] The chi-square test was used to determine whether the study groups were equivalent with respect to categorical variables.

[b] Reported sample size is the number of women who completed the immediate post-test survey and are included in the analysis. It does not account for item nonresponse for any of the measures listed in the table.

The status of participants' relationship with their baby's father varied substantially. Roughly two-thirds of participants were still in a romantic relationship with the father at the time of the baseline survey. This 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 do not have contact with their baby's father.

Teen pregnancy was not unusual in participants' families or peer group. Slightly more than half 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 who are their age have been a teen parent.

Although a sizable proportion of women in the sample had become sexually active at a young age, most women in the sample 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 that 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 they were trying to get pregnant when they became pregnant. Almost all participants reported that they would like to wait until their baby is at least two 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, 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 LARC.

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, the program is delivered by trained staff called advisors in seven one-hour home visits and two 90-minute group sessions. In each visit, the advisor guides 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 take 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.

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	3.5	2.8	0.7	0.86
13 or 14 years	31.5	32.1	-0.6	
15+ years	65.0	65.0	0.0	
Lifetime number of sexual partners (%)				
1	49.9	49.1	0.8	0.53
2-3	31.1	34.4	-3.3	
4+	19.1	16.5	2.6	
Pregnant more than once (%)	12.6	7.5	5.1*	0.02
Trying to get pregnant when got pregnant with baby (%)	20.6	18.6	2.0	0.49
In past four weeks (%):				
Had sexual intercourse	41.6	39.7	1.9	0.59
Had sexual intercourse without LARC[b]	38.2	33.9	4.3	0.21
Had sexual intercourse without condom	25.7	28.7	-3.0	0.34
Had any unprotected sexual intercourse[c]	18.4	14.3	4.1	0.12
If having sexual intercourse in the next year (%):				
Intends to use LARC[b]	30.6	29.7	0.9	0.78
Intends to use a condom	94.2	90.4	3.8*	0.05
Intends to use an effective method of protection[d]	85.1	83.5	1.6	0.53
Would like to wait until baby is at least 2 years old to get pregnant again (%)	95.3	92.2	3.1	0.21
Sample Size[e]	**383**	**417**		

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

[a] The chi-square test was used to determine whether the study groups were equivalent with respect to 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 size is the number of women who completed the immediate post-test survey and are 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.

Before the *AIM 4 Teen Moms* program began, all advisors received extensive training. 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 play 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 comfort level, 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 the *AIM 4 Teen Moms* program.

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 (Asheer and Kisker 2014). 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 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 that 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 that already served teen mothers. In Los Angeles County, existing programs that that serve teen mothers include state-funded programs such as Cal-Learn and AFLP, as well as a broad range of local programs provided through hospitals, schools, and community-based organizations. See Chapter I for a more detailed description of the range of programs and services available to teen mothers in Los Angeles County.

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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 the control group. As discussed in Chapter II, all participants, as a condition of enrollment, completed a baseline survey prior to random assignment. A follow-up survey was then administered roughly 12 months later. The surveys were administered in both English and Spanish using audio computer-assisted self-interviewing (ACASI). We used ACASI to accommodate the participants' low anticipated literacy level and to allow participants to answer sensitive personal questions privately. Trained data collection staff administered the surveys on a laptop computer in the participants' homes. The data collectors remained available in the home to provide support if needed while the participants completed the surveys. The survey collected a broad range of information on participants' demographic and personal characteristics, family relationships, attitudes, sexual risk behaviors, and pregnancy histories. Upon completion of the 12-month follow-up survey, each participant received a $20 gift card.

In the remainder of this chapter, we first describe the outcome measures constructed from the 12-month follow-up survey. We then discuss the analytic methods used to assess the impacts of the *AIM 4 Teen Moms* on those in the treatment group. Appendix B contains more detailed information on the measures.

A. Outcome measures

Drawing on data from the 12-month follow-up survey, we constructed seven groups of outcome measures, each corresponding to one of the PPA study's research questions: (1) prevalence of unprotected sexual intercourse; (2) use of different types of contraceptive methods; (3) sexual behaviors not directly targeted by the program; (4) exposure to information on contraceptive methods; (5) engagement in school or work and educational aspirations; (6) attitudes toward safe sex and methods of protection; and (7) intentions toward sexual activity, contraceptive use, and repeat pregnancy. These measures are summarized in Table III.1 and described in greater detail below.

1. 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. An effective contraceptive method was defined 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 12-month follow-up when constructing this outcome measure.

Table III.1. Outcome measures

Measure	Definition
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 did not have intercourse or always used an effective contraceptive method during intercourse.
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 did not have intercourse or always used a LARC during intercourse.
Had sexual intercourse without using 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 did not have sexual intercourse or used the specified contraceptive method during all months in which they were sexually active.
Sexual risk behaviors not directly targeted by the program	
Rate of sexual activity	Binary variable: equals 1 if reported having sexual intercourse in the past 3 months; equals zero if did not have intercourse.
Number of partners	Continuous variable: number of reported sexual partners in the past 12 months.
Exposure to information on contraceptive methods	
Receipt of information in the past 12 months	Series of nine binary variables: equals 1 if participant reported receiving information on specified topics; equals 0 if did not receive information.
Received information from a nurse, social worker, or health professional during a home visit	Binary variable: equals 1 if participant received information from a nurse, social worker, or health professional during a home visit; equals 0 if did not receive information from this source.
Received information at a clinic from a doctor, nurse, or health professional	Binary variable: equals 1 if participant received information at a clinic from a doctor, nurse, or health professional; equals 0 if did not receive information from this source.
Received information at a hospital	Binary variable: equals 1 if participant received information at a hospital; equals 0 if did not receive information from this source.
School or work engagement and education aspirations	
School or work engagement	Binary variable: equals 1 if participant reported being enrolled in school or working full- or part-time; equals 0 if they reported that they were not enrolled in school and that they were not working full- or part-time.
Aspires to attend school after high school	Binary variable: equals 1 if participant reported that they expect to attend school after they graduate from high school or obtain their GED; equals 0 if they reported a high school diploma or GED as the highest level of education they expect to complete.
Aspires to graduate from a 4-year college or obtain more education	Binary variable: equals 1 if participant reported that they expect to graduate from a 4-year college or obtain a graduate degree; equals 0 if they reported that they do not expect to graduate from a 4-year college or obtain a bachelor's degree.
Attitudes toward safe sex and methods of protection	
Perceived need for birth control	Binary variable: equals 1 if participant reported that they strongly agree that birth control should always be used if a person your age has sexual intercourse; equals 0 if participant did not strongly agree.
Perceived ease of using birth control	Binary variable: equals 1 if participant reported that they strongly agree that birth control is a hassle to use; equals 0 if participant did not strongly agree.

TABLE III.1. *(CONTINUED)*

Measure	Definition
Perceived access to birth control	Binary variable: equals 1 if participant reported that they strongly agree that birth control is pretty easy to get; equals 0 if participant did not strongly agree.
Perceived importance of using birth control	Binary variable: equals 1 if participant reported that they strongly agree that birth control is important to make sex safe; equals 0 if participant did not strongly agree.
Perceived side-effects of using birth control	Binary variable: equals 1 if participant reported that they strongly agree that birth control has too many side effects; equals 0 if participant did not strongly agree.
Intentions toward unprotected sexual activity and repeat pregnancy	
Intentions to have sexual intercourse	Binary variable: equals 1 if participant reported intending to have sexual intercourse in the next year; equals 0 if participant reported less intention.
Intentions 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.
Intentions 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.
Intentions to use an effective contraceptive method (other than condoms).	Binary variable: equals 1 if participant reported intending to use an effective contraceptive method (other than condoms) if she has sexual intercourse; equals 0 if participant reported less intention.
Intention to avoid a repeat pregnancy	Binary variable: equals 1 if participant reported that they are "sure" they will not be pregnant again before their child turns two; equals 0 if they reported less intention.

2. Use of different types of effective contraceptive methods

To assess participants' use of different types of effective contraceptive methods, the survey asked whether they had used contraceptive methods during months in which they were sexually active, such as condoms, birth control pills, the patch, and the implant (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 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, and (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.

3. Sexual risk outcomes not directly targeted by the program

As discussed in Chapter I, to test for possible unintended spillover effects, we assessed program impacts on two key sexual risk outcomes not directly targeted by the program and not in the logic model: (1) overall sexual activity rates, and (2) number of sexual partners. However, because of its emphasis on promoting highly effective contraceptive methods, such as LARC, the program might have unintended spillover effects on these other risk outcomes. For example, participants might report higher rates of sexual activity or an increased number of sexual partners after they have reduced their pregnancy risk through the use of LARCs. To examine the possibility for such unintended effects, we constructed two different measures:

- **Had sexual intercourse.** 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 in the past 12 months. The question was limited to vaginal (not oral or anal) 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 over the past 12 months, we retained them in the analysis by coding them as having had zero sexual partners.

4. Exposure to information on contraceptive methods

The 12-month survey included two questions designed to assess participants' exposure to information about different contraceptive methods. The first asked participants whether they had received any information in the past 12 months about contraceptive methods, where to get contraceptives, or specific contraceptive methods (such as condoms, IUDs, and the contraceptive impacts). For methods such as contraceptive shots, vaginal rings, IUDs, and the contraceptive implant, the survey listed specific brand names in addition to a generic name. For example, the survey listed Depo-Provera as a specific brand name for contraceptive shots. We used the responses to create a series of nine binary (yes/no) measures of whether the participant had received information on each topic. The second question asked participants whether they had received such information from the following different sources: at home from a nurse, social worker, or other health professional; at a clinic from a doctor, nurse or health professional; at a hospital; and so on. We used the responses to create a series of three binary measures of whether the participant had received information from each of the following sources: (1) at home from a nurse, social worker, or other health professional; (2) at a clinic from a doctor, nurse or health professional; and (3) at a hospital. These questions allowed us to assess whether teen mothers assigned to the treatment group reported greater overall exposure to information on contraceptive methods relative to mothers in the control group. However, we cannot attribute any observed differences in these outcomes to information received from the *AIM 4 Teen Moms* program sessions per se. For example, observed differences could reflect increased utilization of local health services rather than information received from the program sessions.

5. School or work engagement and education aspirations

To examine whether the program had its intended effects on future goals and targeted youth development outcomes, we constructed two different measures:

- **School or work engagement.** We combined responses from two survey questions to measure the impact of the program on school or work engagement. The first asked participants about their current school status. Specifically, participants were asked if 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. Participants were considered 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."

Participants were considered working if they reported that they were 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. In additional sensitivity analyses reported in Appendix C, we found similar results when analyzing the two questions separately.

- **Educational aspirations.** For this set of measures, the survey asked participants, "What is the highest level of education you expect to complete?" The five possible responses were (1) "graduate from high school or obtain a GED," (2) "attend technical or vocational school," (3) "graduate from a 2-year community college (associate's degree)," (4) "graduate from a 4-year college (bachelor's degree), or (5) "obtain a graduate degree (master's, Ph.D., M.D., etc.)." On the basis of the response to this question, we created two binary (yes/no) indicators to measure educational aspirations. The first indicates whether the participant reported that they would like to attend school after graduating from high school. The second indicates whether the participant reported that they would like to graduate from a 4-year college or obtain a graduate degree. We examined these outcomes separately in part to separate aspirations for (1) postsecondary enrollment versus (2) postsecondary completion. In additional sensitivity analyses reported in Appendix C, we found similar results when analyzing program impacts on a single-item measure of educational aspirations ranging from 1 (graduate from high school or obtain a GED) to 5 (obtain a graduate degree).

6. Attitudes toward safe sex and methods of protection

The survey asked participants a series of questions about their attitudes toward birth control access and use. Each question targeted a different topic, ranging from feelings of general support for birth control to perceived barriers such as ease of access or negative side effects. The questions referred to general "birth control" methods broadly defined; the survey did not measure participants' attitudes toward specific contraceptive methods, such as LARCs. We used responses to these questions to construct a set of five separate measures of attitudes toward safe sex and methods of protection:

- **Perceived need for birth control.** The survey asked participants whether they agreed or disagreed with the statement "birth control should always be used if a person your age has sexual intercourse."
- **Perceived ease of using birth control.** The survey asked participants whether they agreed or disagreed with the statement "birth control is a hassle to use."
- **Perceived access to birth control.** The survey asked participants whether they agreed or disagreed with the statement "birth control is pretty easy to get."
- **Perceived importance of birth control.** The survey asked participants whether they agreed or disagreed with the statement "birth control is important to make sex safe."
- **Perceived side effects of using birth control.** The survey asked participants whether they agreed or disagreed with the statement "birth control has too many side effects."

For all five measures, the five response categories ranged from "strongly agree" to "strongly disagree." We used responses to each question to construct a binary measure comparing participants who said they "strongly disagree" with this statement to participants who did not strongly disagree.

As discussed in Appendix B, we explored the possibility of combining these separate outcomes into a single summary scale or index. However, an exploratory factor analysis found that the combined measure had low reliability.

7. Intentions toward unprotected sexual activity and repeat pregnancy

The survey included a series of questions designed to assess participants' intentions toward unprotected sexual activity and their beliefs about the likelihood that they will have a repeat pregnancy. The first question asked participants whether they intended to have sexual intercourse in the next year. The second asked participants whether they intended to use an effective method of protection if they had sex. Specifically, participants were asked whether they intended to use each of the following contraceptive methods if they had sex in the next 12 months: a condom, an IUD, an implant, or other contraceptive methods (not including condoms). We used responses to the first and second question to create a series of four binary (yes/no) measures of whether the participant intended to engage in each sexual activity. The last question asked participants their chances of getting pregnant again before their child turns 2. The five possible response categories ranged from "I am sure I will" to "I am sure I will not." For this question, we constructed a binary measure comparing participants who said "I am sure I will not" get pregnant again to those who reported a greater likelihood of getting pregnant.

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 for 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 that are 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 C explores the robustness of our results to alternative specifications of the regression models.

Each regression model included the following covariates: a binary indicator for treatment status, binary indicator variables for each recruitment location, two key demographic variables that research has shown to be highly correlated with our key outcomes of interest (age and race), a baseline measure of the outcome (if available), and additional baseline covariates empirically selected through a data-driven forward selection procedure developed previously in the literature

(Social and Character Development Research Consortium 2010). For this forward selection 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 rapid repeat pregnancy. Appendix B provides a complete list of the covariates considered. From this list of candidate covariates, the forward selection procedure involved 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). From the full list of candidate covariates listed in Appendix B, only those variables picked through the forward selection procedure were ultimately included in the final regression models. We used the same set of covariates for each outcome. Appendix C explores the robustness of our results when excluding covariates identified through this forward selection procedure. For all baseline covariates, we used dummy variable adjustment to avoid losing any cases on account of missing baseline data (Puma et al. 2009).

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 12 separate measures of exposure to information, 5 measures of attitudes, and 5 measures of intentions. 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 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 apply a multiple hypothesis testing procedure outlined by Hothorn et al. (2008) and Schochet (2009). This procedure involves adjusting the reported *p*-value for each test to account for other tests conducted within the same "family" of related measures. Similar to other common methods of adjusting for multiple hypothesis testing, this procedure yields a 5 percent false-positive rate across outcomes within the same family. However, the procedure is less 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 seven groups of outcome measures described earlier in this chapter (and presented in Table III.1). That is, we adjusted the *p*-values accounting for multiple outcomes within each of the seven groups of measures, but not for multiple outcomes measured across the different groups. We followed this approach because each group of outcomes aligns with a different research question. We base our substantive conclusions for each question on only the corresponding group of outcome measures. The number of outcomes measured in other groups has no bearing on our substantive conclusions for each question and therefore does not warrant an additional adjustment for multiple hypothesis testing. To allow readers to assess the magnitude of the adjustment, we report unadjusted *p*-values alongside the adjusted values in Chapter IV.

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IV. RESULTS

Our results indicate 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. Participants assigned to the treatment group were less likely than those in the control group to report having had sex without using an effective contraceptive method, and this difference was statistically significant. We also found that teen mothers assigned to the treatment group were significantly more likely to report having received information on highly effective contraceptive methods, including LARCs.

However, we found no evidence of statistically significant impacts on several other interim outcomes. 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. We found no evidence that the program had detectable impacts on participants' choice of contraceptive methods, and participants assigned to the treatment group were no more likely than those in the control group to report intentions to use LARCs or to avoid a rapid repeat pregnancy. We detail these findings in the remainder of this chapter.

A. Program impacts on sexual risk behaviors

In evidence consistent with the program's goal of reducing risky sexual behavior, we found a statistically significant difference in rates of unprotected sexual activity between the treatment and control groups (Table IV.1). Among participants in the treatment group, 23.1 percent reported having unprotected sex in the past three months, compared to a rate of 29.7 percent in the control group. By contrast, we found no statistically significant differences when looking at rates of unprotected sexual activity for specific types of contraceptive methods. Participants in the treatment group were equally likely to report having had sex without a contraceptive implant as participants in the control group. In addition, participants in the treatment group were just as likely as those in the control group to report having had sex without an IUD (63.5 percent for the treatment group and 63.9 percent for the control group). Taken together, these findings suggest that the program had success in reducing overall rates of unprotected sexual activity but did not have detectable effects on participants' choice of specific contraceptive methods.

We found no evidence that the program's promotion of highly effective contraceptive methods, such as LARCs, had any unintended spillover effects to sexual risk behaviors not directly targeted by the program (Table IV.1). In particular, we found no evidence that participants in the treatment group were more likely than those in the control group to report having had sexual intercourse in the past three months. In both study groups, about 7 in 10 participants reported having had sexual intercourse in the past three months (66.1 percent for the treatment group and 68.9 percent for the control group). Participants in both study groups also reported having had a similar number of sexual partners in the past 12 months (an average of just over one partner in both study groups). These null effects are important to demonstrate that the program's promotion of highly effective contraceptive methods did not lead participants to engage in higher rates of other risk behaviors.

Table IV.1. Impacts on sexual risk behaviors

Measure	Treatment group	Control group	Difference	*p*-value	
				Adjusted	Unadjusted
Percentage of women who reported having unprotected sex in the past 3 months[a]	23.1	29.7	-6.6*	0.03	0.03
Percentage of women who reported having sexual intercourse in the past 3 months without using each of the following[b]:					
Any LARC[c]	56.1	59.6	-3.4	1.00	0.32
Implant	63.7	68.0	-4.3	1.00	0.19
IUD	63.5	63.9	-0.4	1.00	0.91
Condom	56.1	59.0	-2.9	1.00	0.39
Birth control pills	68.5	68.1	0.4	1.00	0.91
The shot (Depo-Provera)	61.0	62.0	-1.0	1.00	0.77
The patch	70.1	71.2	-1.1	1.00	0.72
The ring (NuvaRing)	70.2	71.2	-1.0	1.00	0.74
Percentage of women who reported having sexual intercourse in the past 3 months[d]	66.1	68.9	-2.8	0.77	0.39
Number of self-reported sexual partners in the past 12 months[d]	1.1	1.1	0.0	1.00	0.87

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 12-month follow-up survey. Sample sizes accounting for item nonresponse range from 760 to 798 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 sexual intercourse without using an effective contraceptive method in the past 3 months.

[b] Measure is included in the domain that relates to the use of different types of contraceptive methods.

[c] Includes the following contraceptive methods: IUD (Mirena or Paragard), or Implant (Implanon).

[d] Measure is included in the domain that relates to behaviors not targeted by the program.

* Significantly different from zero at the .05 level, adjusted *p*-value and two-tailed test.

B. Exposure to information on contraceptive methods

Teen mothers assigned to the treatment group reported increased exposure to information on highly effective contraceptive methods, particularly the contraceptive implant (Table IV.2). Of the treatment group, 77.6 percent reported having received information on the contraceptive implants in the past 12 months, compared to 67.7 percent of the control group. Because of the random assignment evaluation design, we can attribute the 10-percentage-point difference in rates between the two groups to the effects of *AIM 4 Teen Moms*. Participants in the treatment group were also more likely than those in the control group to report having received information on IUDs (80.3 percent versus 74.1 percent), the contraceptive shot (81.2 percent versus 75.8 percent), and hormonal patches (79.6 percent versus 73.6 percent). These differences are not statistically significant after adjusting for multiple hypothesis testing, but the unadjusted tests are statistically significant at the 5 percent level. We found no statistically significant differences for the measures of exposure to information on the hormonal ring, condoms, or birth control pills.

The relatively high rates of exposure to information among the control group participants likely reflect the many other social and health services available to teen mothers in Los Angeles County. Even without any exposure to the *AIM 4 Teens Moms* program, about two-thirds of

control group participants (67.7 percent) reported having received information on hormonal implants in the past 12 months, and nearly three-quarters (74.1 percent) reported having received information on IUDs. In addition, as explained in Chapter III, we cannot attribute any observed differences in rates between the treatment and control groups to information received from the *AIM 4 Teen Moms* program sessions per se. The reported rates reflect information from all sources, not just the *AIM 4 Teen Moms* program sessions.

Table IV.2. Impacts on exposure to information on contraceptive methods

Measure[a]	Treatment group	Control group	Difference	*p*-value	
				Adjusted	Unadjusted
Percentage of women that reported receiving information on the following topics in the past 12 months:					
Implant (Implanon)	77.6	67.7	10.0*	0.02	<0.01
IUD (Mirena or Paragard)	80.3	74.1	6.2	0.43	0.04
The shot (Depo-Provera)	81.2	75.8	5.4	0.74	0.06
The patch	79.6	73.6	5.9	0.56	0.05
The ring (NuvaRing)	78.5	74.3	4.2	1.00	0.16
Condoms	86.4	83.5	2.9	1.00	0.24
Birth control pills	84.1	83.4	0.7	1.00	0.78
Methods of birth control	84.6	82.5	2.1	1.00	0.41
Where to obtain birth control	86.8	85.0	1.7	1.00	0.48
Percentage of women that 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	7.2	0.25	0.02
Clinic appointment with a doctor, nurse or other health professional	71.8	75.3	-3.4	1.00	0.27
Hospital	15.5	19.7	-4.2	1.00	0.12

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 12-month follow-up survey. Sample sizes accounting for item nonresponse range from 786 to 798 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 prior to survey administration. Appendix B contains a more detailed description of each measure.

* Significantly different from zero at the .05 level, adjusted *p*-value and two-tailed test.

One unexpected finding is that only a quarter of participants in the treatment group (28.1 percent) reported having received information on reproductive health topics or contraceptive methods during a home visit (Table V.2). This finding is unexpected, because most of the *AIM 4 Teen Moms* sessions are delivered to participants in their homes and because program attendance data indicate that most treatment group participants received multiple visits (Asheer and Kisker 2014). One possible explanation for this finding is that few *AIM 4 Teen Moms* sessions had an exclusive focus on contraceptive methods and often included discussion of broader topics, such as future goals and career planning, which may have affected participants' perceptions of the specific services received. In addition, the specific wording of the survey question asked participants if they had received information from a "nurse, social worker, or other health care

professional" during a home visit, and some program participants may not have associated these titles with the *AIM 4 Teen Moms* home visitors.

C. School or work engagement and educational aspirations

We found no statistically significant differences in the measures of school or work engagement and educational aspirations (Table IV.3). Participants in the treatment group were no more likely than those in the control group to report current school enrollment or employment (79.1 percent versus 78.7 percent), expectations to attend postsecondary schooling (75.7 percent versus 73.8 percent), or expectations to graduate from a 4-year college (49.5 percent versus 47.8 percent). These findings may reflect in part the relatively strong engagement in school or work reported by the large majority of study participants. For example, even without any exposure to the *AIM 4 Teen Moms*, more than three-fourths of the control group reported current school enrollment or employment.

Table IV.3. Impacts on school or work engagement and educational aspirations

Measure	Treatment group	Control group	Difference	*p*-value	
				Adjusted	Unadjusted
Percentage of women currently enrolled in school or working part-time or full-time[a]	79.1	78.7	0.4	1.00	0.89
Percentage of women that expect to:					
Attend any schooling after high school	75.7	73.8	1.9	1.00	0.50
Graduate from a 4-year college	49.5	47.8	1.7	1.00	0.62

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 12-month follow-up survey. Sample sizes accounting for item nonresponse range from 786 to 795 depending on the measure. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

[a] Includes enrollment in the following types of schools: middle or high school, continuation/alternative school or court/community school, adult education classes, technical or vocation school, 2-year college, and 4-year college or university. Both part-time and full-time work are considered working.

D. Attitudes and intentions

We found no statistically significant differences in the measures of attitudes or intentions (Table IV.4). For each of the five attitude measures examined, the reported differences between the treatment and control groups are small and not statistically significant. As discussed in Chapter III, the survey measured participants' attitudes toward "birth control" methods generally defined. It did not measure their attitudes toward LARC or other specific contraceptive methods. For the intentions measures, participants in the treatment group were slightly less likely than those in the control group to report intentions to have sex in the next 12 months, but the difference is not statistically significant. Participants in the treatment group were no more likely than those in the control group to report intentions to use LARCs or other contraceptive methods when having sex. For the measure of intentions to avoid a repeat pregnancy, a majority of participants in both study groups reported planning to avoid pregnancy in the next 12 months

(60.5 percent of the treatment group and 57.2 percent of the control group). The reported difference in pregnancy intentions between groups is not statistically significant.

Table IV.4. Impacts on attitudes and intentions

Measure	Treatment group	Control group	Difference	*p*-value	
				Adjusted	Unadjusted
Percentage of women reporting they "strongly agree" that [a]:					
Birth control should always be used when someone their age has sexual intercourse	60.8	61.5	-0.7	1.00	0.84
Birth control is a hassle	7.2	7.2	0.0	1.00	1.00
Birth control is pretty easy to get	48.0	45.0	3.0	1.00	0.39
Birth control is important to make sex safer	58.6	58.5	0.2	1.00	0.95
Birth control has too many negative side effects	9.4	10.9	-1.5	1.00	0.47
Percentage of women reporting intentions to engage in the following behaviors in the next 12 months[b]					
Have sexual intercourse	76.3	81.0	-4.7	0.49	0.10
Use LARC if having sex[c]	42.7	42.7	0.0	1.00	1.00
Use condoms if having sex	85.8	87.3	-1.4	1.00	0.54
Use protection method other than condoms if having sex[d]	87.3	91.0	-3.7	0.49	0.10
Percentage of women reporting that they are "sure" they will not be pregnant again before their child turns 2[b]	60.5	57.2	3.3	1.00	0.33

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 12-month follow-up survey. 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 Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

[a] Measure is included in the domain that relates attitudes toward contraceptive use.

[b] Measure is included in the domain that relates to intentions toward unprotected sexual activity and repeat pregnancy.

[c] Includes the following contraceptive methods: IUD (Mirena or Paragard), or Implant (Implanon).

[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).

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V. DISCUSSION AND CONCLUSION

This report presents interim impacts of *AIM 4 Teen Moms,* a program designed to improve contraceptive use and reduce the risk of rapid repeat pregnancy among new teen mothers. The program is an adaptation of an existing teen pregnancy prevention program called *Project AIM,* which originally showed promise in reducing sexual risk behaviors among at-risk middle school students (Clark et al. 2005). To adapt the program for use with teen mothers, CHLA changed the majority of program sessions from a teacher-led, group-based format to more individualized, one-on-one meetings in the participant's home. In addition, CHLA adapted the content of each session to address topics of particular relevance to teen mothers, such as birth spacing and future reproductive planning. *AIM 4 Teen Moms* retains the program's core emphasis on positive youth development, planning for the future, and the promotion of healthy lifestyles and behaviors.

Drawing on data from a rigorous random assignment impact evaluation conducted with a large sample of more than 900 new teen mothers in Los Angeles County, we found that *AIM 4 Teen Moms* succeeded in reducing rates of unprotected sexual activity among teen mothers. Among the teen mothers assigned to the treatment group, 23.1 percent reported having had unprotected sex in the past three months, compared to 29.7 percent in the control group. The program also increased teen mothers' exposure to information on certain types of contraceptive methods. 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. We also found no evidence that the program had detectable effects on the use of highly effective contraceptive methods such as LARCs.

One possible explanation for these modest impacts is the large number of existing programs and services available in the areas in which the intervention was evaluated. As discussed in Chapter I, 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 support services (Asheer and Kisker 2014). For the purposes of this demonstration project and evaluation, CHLA sought to supplement these existing programs and services by providing a more cohesive, structured program centered on 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 our study, it appears that many teen mothers in Los Angeles County already have access to some of the information targeted by the program and express positive aspirations for their futures. *AIM 4 Teens Moms* may have the potential to yield effects on a broader range of outcomes if implemented in areas with fewer available programs and support services.

Our study findings may also reflect the particular population included in the analysis. For the purposes of this demonstration project and evaluation, CHLA recruited a volunteer sample of predominantly low-income, Latina teen mothers. Identifying effective programs for this population is important, first because Latinas have the highest teen birth rates of all major racial/ethnic groups in the United States (Ventura et al. 2014), and second because Latinas account for three quarters of all teen births in California (California Department of Public Health 2014). However, mounting research evidence suggests that Latinas also have distinct relationship dynamics, health risk behaviors, and attitudes toward pregnancy and contraceptive use (Aiken et al. 2013; Harnett 2012; Hayford et al. 2013; Pflieger et al. 2013), that might require distinctive

programmatic approaches or more culturally tailored prevention programs. In addition, because the study relied on a volunteer sample, the particular teen mothers 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 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 teen mothers who were lost to follow-up represented a higher-risk population than the sample of teen mothers included in analyses presented in this report. As a result, our interim impact findings may not generalize to all young women originally recruited for the study.

The apparent lack of detectable impacts on teen mothers' choice of contraceptive methods may reflect limited or differential access to specific contraceptive methods. *AIM 4 Teen Moms* provides teen mothers with detailed information on a full range of contraceptive methods, including highly effective LARCs. Although we found that teen mothers assigned to the treatment group were more likely than those in the control group to report having received information on LARCs, we found no statistically significant differences in their reported intentions to use LARCs or in self-reported rates of sexual activity without use of a LARC. In recent years, findings from the St. Louis-based Contraceptive CHOICE project have received considerable attention for demonstrating the importance of financial barriers and other practical constraints in limiting the uptake of LARC methods among adolescents and young adults (Secura et al. 2010, 2014). The *AIM 4 Teen Moms* program attempts to address these barriers in part by providing teen mothers with information on LARC methods and having them develop personalized reproductive life plans. However, the program was not designed to provide participants with direct access to contraceptive services, and our study surveys did not ask detailed questions about perceived barriers to contraceptive services. It is possible that such logistical barriers played a role in shaping the choice of contraceptive methods among participants in this study.

A future article will use 12-month follow-up data to examine the full set of mediating variables underlying the program's positive youth development theoretical model. These analyses will aid in interpreting the interim results and understanding what aspects of the program worked and did not work in its effort to change contraception behaviors and ultimately repeat-pregnancy rates. In particular, these analyses involve (1) examining relationships between the hypothesized mediators (e.g., regulatory focus on prevention/promotion, or motivation) and targeted behavior and health outcomes; (2) assessing the impacts of these mediators on targeted behavior and health outcomes; and (3) conducting a formal mediation analyses, which can provide a better understanding of what parts of the program influenced outcomes in the desired direction and what parts, if any, did not for this population and setting.

Future reports will also use 24-month follow-up data to answer the primary and ultimate question of whether *AIM 4 Teen Moms* was successful in reducing rates of rapid repeat pregnancy. The evidence presented in this interim report suggests 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 key interim outcomes could diminish or blunt any long-term effects on rates of rapid repeat pregnancy. On the other hand, we found favorable program effects on the most proximate and

consequential determinant of repeat pregnancy: rates of unprotected sex. In a future report, we will examine whether the program's success in reducing rates of unprotected sexual activity 12 months after teen mothers enrolled in the study led to continued reductions in the rates of unprotected sex and longer-term declines in rates of rapid repeat pregnancy.

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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 12-month follow-up survey. As reported in Chapter II, among the 942 young women who enrolled in the study and were randomly assigned to the treatment and control groups, 800 completed the 12-month follow-up survey, for an overall response rate of 85 percent. The remaining 142 participants did not complete a 12-month follow-up survey and were therefore excluded from the interim 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 a total of 24 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 four statistically significant differences. Compared to the 800 young women included in the analysis, the 142 nonrespondents were (1) less likely to report living with their parents, (2) more likely to report having had sexual intercourse in the four weeks prior to the baseline survey, (3) more likely to report having had sexual intercourse without using a condom in those four weeks, (4) and more likely to report having had sexual intercourse without a using LARC in those four weeks. We also found sizable differences between the groups in other characteristics, such as behind in grade level, mother is a teen mother, and lifetime number of sexual partners; however, these differences were not statistically significant at the 5 percent level.

Taken together, these findings suggest that the sample of 142 nonrespondents represented a higher-risk population than the sample of 800 young women included in our interim impact analyses, and therefore that our interim 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	11.9	11.2	0.7	0.95
16	23.2	24.5	-1.3	
17	29.9	28.0	1.9	
18+	35.0	36.4	-1.4	
Child's age (%)				
1-3 months	67.0	62.5	4.5	0.58
4-6 months	31.2	35.3	-4.1	
7-12 months	1.8	2.2	-0.4	
Race/ethnicity (%)				
Latina	84.9	84.4	0.5	0.97
Non-Latina black	11.3	11.9	-0.6	
Non-Latina white	1.1	0.7	0.4	
Non-Latina other	2.7	3.0	-0.3	
Language spoken at home (%)				
English	27.7	32.4	-4.7	0.46
Spanish	20.7	21.1	-0.4	
Both English and Spanish	51.6	46.5	5.1	
Household structure (%)				
Lives with mother	76.7	58.7	18.0**	<.01
Lives with father	31.1	18.2	12.9**	
Lives with both mother and father	28.7	15.4	13.3**	
Enrolled in school or currently working (%)	86.5	87.3	-0.8	0.80
Behind grade level (%)	38.2	44.4	-6.2	0.17
Highest level of education would like to complete (%)				
Graduate from high school	20.9	27.3	-6.4	0.63
Some technical or vocational training	3.6	4.2	-0.6	
Graduate from a 2-year college	21.0	19.6	1.4	
Graduate from a 4-year college	31.8	27.3	4.5	
Obtain a graduate degree	20.3	18.9	1.4	
Other	2.4	2.8	-0.4	
Relationship with baby's father (%)				
Married	1.8	1.4	0.4	0.46
Living together but not married	21.0	23.7	-2.7	
Dating but not living together	42.9	36.0	6.9	
Not in a relationship	34.3	38.8	-4.5	
Mother was a teen mother (%)	53.4	59.7	-6.3	0.17
At least half their friends are teen parents (%)	23.6	25.2	-1.6	0.68
Sample size[b]	**800**	**142**		

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

[a] The chi-square test was used to determine whether the study groups were equivalent with respect to categorical variables.

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

Table A.2. Baseline sexual risk behaviors and intentions

Measure	Respondent	Nonrespondents	Difference	*p*-value[a]
Age at first sexual intercourse (%)				
<13 years	3.2	3.0	0.2	0.37
13 or 14 years	31.8	38.1	-6.3	
15+ years	65.0	59.0	6.0	
Lifetime number of sexual partners (%)				
1	49.4	40.6	8.8	0.18
2-3	32.8	39.1	-6.3	
4+	17.7	20.3	-2.6	
Pregnant more than once (%)	10.0	9.9	0.1	0.97
Trying to get pregnant when pregnant with baby (%)	19.6	19.4	0.2	0.97
In past four weeks (%):				
Had sexual intercourse	40.6	52.6	-12.0*	0.01
Had sexual intercourse without condom	27.2	36.1	-8.9*	0.04
Had sexual intercourse without LARC[b]	35.9	46.3	-10.4*	0.02
Had unprotected sexual intercourse[c]	16.2	22.3	-6.1	0.09
If having sexual intercourse in the next year (%):				
Intends to use a condom	92.3	87.8	4.5	0.08
Intends to use a LARC[b]	30.2	31.5	-1.3	0.75
Intends to use an effective method of protection[d]	84.3	80.0	4.3	0.21
Sample Size[e]	**800**	**142**		

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

[a] The chi-square test was used to determine whether the study groups were equivalent with respect to 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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This appendix provides more detailed information on the 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 interim impact estimates presented in this report are based on survey data collected in (1) a baseline survey administered prior to enrollment in the study, and (2) a follow-up survey about 12 months later. Both surveys used audio computer-assisted self-interviewing (ACASI) to accommodate the participants' low anticipated literacy levels and to allow participants 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, sexual activity, past pregnancies, and future intentions. The surveys were developed by the PPA research team in coordination with ETR and CHLA. 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 expectant or parenting young women.

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 the 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 therefore 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, the surveys were administered by independent field staff 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 seven groups of outcome measures: (1) prevalence of unprotected sexual intercourse; (2) use of different types of contraceptive methods; (3) sexual behaviors not targeted by the program; (4) exposure to

information on contraceptive methods; (5) engagement in school or work and educational aspirations; (6) attitudes toward safe sex and methods of protection; and (7) intentions toward sexual activity, contraceptive use, and repeat pregnancy. In this section, we detail how we constructed the outcome measures for each of these groups.

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:

- Have you had sexual intercourse in the past three months?
- 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 sexual intercourse without using an effective contraceptive method at least once to participants who reported that they have 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 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 include 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 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 prior to the date they completed the 12-month follow-up survey. If participants did not report such 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 three 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 the participant 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 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. Exposure to information

As discussed in Chapter III, we used data from the 12-month follow-up survey to construct a series of measures on exposure to information on contraceptive methods. We constructed the measures from two questions on the survey. The first asked participants whether in the past 12 months they had received any information on these contraceptive methods or topics: Implant (Implanon), IUD (Mirena or Paragard), the shot (Depo-Provera), the patch, the ring (NuvaRing), condoms, birth control pills, methods of birth control, or where to get birth control.

For each topic, we constructed a binary (yes/no) indicator to measure the percentage of participants who reported receiving information on the topic (yes = 1, no = 0). We coded participants who did not respond to the question as missing values.

Participants were then asked a follow-up question about where they had received the information. For the purposes of this report, we focused specifically on receipt of information from three sources:

- A nurse, social worker, or other health care professional who came to your home
- A doctor, nurse, or other health professional you saw at a clinic
- A hospital

For each source, we constructed a binary (yes/no) indicator to measure the percentage of participants who reported receiving information from that source (yes=1, no=0). We coded participants who did not respond to the question as missing values.

5. School or work engagement and education aspirations

The 12-month follow-up survey included two questions designed to assess participants' school or work engagement. The survey first asked participants their current school status, where 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 vocation school
- Enrolled in 2-year college
- Enrolled in 4-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 participants who reported that they were not 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 participants 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 indicate whether the participant is enrolled in school and whether the participant is 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.

To assess education aspirations, the survey asked participants, "What is the highest level of education you expect to complete?" The five possible response categories were "graduate from high school or obtain a GED," "attend technical or vocational school," "graduate from a 2-year community college (associate's degree)," "graduate from a 4-year college (bachelor's degree)," or "obtain a graduate degree (master's, Ph.D., M.D., etc.)." On the basis of the response to this question, we created two binary (yes/no) indicators to measure education aspirations. The first

measure indicates whether the participant reported that they would like to attend school after graduating from high school. For this measure, we compare participants who reported they would like to "attend technical or vocational school," "graduate from a 2-year community college," "graduate from a 4-year college, or "obtain a graduate degree" to participants who reported they would like to "graduate from high school or obtain a GED." The second measure indicates whether the participant reported that they would like to graduate from a 4-year college or obtain more education. For this measure, we compare participants who reported that they would like to "graduate from a 4-year college" or "obtain a graduate degree" to participants who reported that they would like to "graduate from high school or obtain a GED," "attend technical or vocational school," or "graduate from a 2-year community college." For both measures, we coded participants who did not respond to the question as missing values.

6. Attitudes toward safe sex and methods of protection

To measure attitudes toward birth control access and use, the survey asked participants whether they agreed or disagreed with the following five statements:

- Birth control should always be used if a person your age has sexual intercourse.
- Birth control is a hassle to use.
- Birth control is pretty easy to get.
- Birth control is important to make sex safe.
- Birth control has too many side effects.

For each statement, the possible response categories were "strongly agree," "agree," "neither agree nor disagree," "disagree," and "strongly disagree." We used responses to each question to construct a binary measure comparing participants who said they "strongly agree" with the statement to participants who did not strongly agree. We coded participants who did not respond to the question as missing values.

For the purposes of our analysis, we treated each question as a separate outcome and estimated program impacts separately for each. We had initially considered combining the five questions into a single summary scale or index. However, we ultimately decided against this approach, because an exploratory factor analysis suggested that the combined measure had low reliability.

7. Intentions toward unprotected sexual activity and repeat

The survey included four questions concerning youth intentions toward sexual activity:

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

- Which of the following do you plan on using? Birth control pills, the shot (Depo-Provera), the patch, the ring (NuvaRing), IUD (Mirena or Paragard), implants (Implanon), other.

The response categories for the first three questions were "yes, definitely"; "yes, probably"; "no, probably not"; and "no, definitely not." For these questions, we constructed a binary measure comparing participants who responded "yes, definitely" or "yes, probably" to participants who responded in any of the other two categories. For each question, participants who did not respond to the question nonresponders were coded as missing. We combined the third and fourth questions to measure the participants' intention to use a LARC. This is a binary variable that equals 1 if the participant (1) responded "yes, definitely" or "yes, probably" to the third question; and (2) indicated that they are planning to use an IUD or implant. The binary variable equals 0 if the participant (1) responded "no, definitely" or "no, probably" to the third question; or (2) indicated that they are not planning to use an IUD or an implant. Participants were coded as missing if they did not respond to the third question, or if they responded "yes, definitely" or "yes, probably" to the third question and did not respond to the fourth question.

To measure intentions to avoid a repeat pregnancy, the survey asked, "How likely do you think it is that you will be pregnant again before your first child turns two?" The possible response categories were "I am sure I will," "I probably will," "there is a 50/50 chance I will," "I probably will not," and "I am sure I will not." We used the responses to construct a binary measure comparing participants who responded "I am sure I will not" to participants who responded "I am sure I will," "I probably will," "there is a 50/50 chance I will," or "I probably will not." We coded participants who did not respond to this question as missing values.

C. Baseline measures considered as candidate covariates

As discussed in Chapter III, to improve the precision of the impact estimates, we used a data-driven forward selection process to identify baseline covariates that are strongly correlated with our outcome measures. Including such covariates can help improve the precision of the impact estimates by reducing the amount of residual variation in the outcome measures. Table B.1 shows a full list of candidate covariates we considered for the model. To select from this list, we first identified any variables for which the observed difference between the treatment and control groups had a *p*-value of 0.20 or less. Second, we identified variables that the literature has shown to have a strong link with risky sexual behavior and rapid repeat pregnancy. We entered any variable meeting these criteria into the forward selection procedure. The results of the selection procedure identified six variables to include as additional variates: (1) participants' self-reported relationship with baby's father, (2) participants' age at first sexual intercourse, (3) an indicator of whether the participant had sexual intercourse in the past four weeks without using an effective contraceptive method, (4) participants' language spoken at home, (5) a scale measure of participants' support of contraceptive methods, and (6) an indicator of whether the participant is a grade level behind for her age. Note that we also used the variables listed in Table B.1 to populate the tables of baseline descriptive statistics presented in Chapter II.

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 her friends have been pregnant; equals 0 if participant reported that less than half 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 her friends have been a teen parent; equals 0 if participant reported that less than half 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.
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.
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.

Measure	Definition
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 pregnant with baby	Binary variable: equals 1 if participant reported trying to get pregnant when pregnant with baby; equals 0 if participant reported not trying to get pregnant when 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 prior to 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 prior to 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 prior to completing the baseline survey; equals 0 if participant reported not doing so.
Had unprotected sexual intercourse without using an effective contraceptive method	Binary variable: equals 1 if participant reported having sexual intercourse without using an effective contraceptive method in the four weeks prior to completing the baseline survey; equals 0 if participant reported not doing so.

APPENDIX C

SENSITIVITY ANALYSES

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The main impact findings presented in Chapter IV are based on a specific set of analytic decisions about how to construct key outcome measures and estimate program impacts. Although we view these analytic decisions as the most suitable and defensible for the specifics of our design, we also assessed the robustness of our results to alternative analytic decisions. In this appendix, we present findings from four types of sensitivity tests. First we discuss the sensitivity of our results to the adjustment for multiple hypothesis testing. We then discuss their sensitivity to the set of covariates included in the regression models. Next we discuss the sensitivity of a subset of our results to the coding of the education and employment outcomes. We end by discussing the sensitivity of our results to the reference period for the contraceptive use measures.

A. Adjustment for multiple hypothesis testing

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

To examine the sensitivity of our results to this adjustment, we estimated comparable regression models without adjusting for multiple hypothesis testing. The unadjusted *p*-values are reported in Chapter IV along with the main impact finding. As shown in Chapter IV, using the unadjusted *p*-values changes the reported statistical significance levels of four outcomes: the percentage of participants who reported receiving information on (1) IUDs; (2) the shot; (3) the patch; and (4) birth control during a home visit from a nurse, social worker, or other health care professional. For these outcomes, the reported impact estimates reach statistical significance at the 5 percent level when not adjusting for multiple hypothesis testing.

B. Alternative specification of covariates

As discussed in Chapter III, we specified our regression models to include the following covariates: a binary indicator for treatment status, binary indicator variables for each of the strata created for random assignment, two key demographic variables that are highly correlated with our key outcomes of interest (age and race), a baseline measure of the outcome (if available), and additional baseline covariates empirically selected through a data-driven forward selection procedure developed previously in the literature (Social and Character Development Research Consortium 2010). To examine the sensitivity of our results to alternative combinations of covariates, we estimated comparable regression models when (1) excluding any covariates identified through the data-driven forward selection procedure, and (2) controlling only for random assignment strata and treatment status (without any additional covariates).

Table C.1. Sensitivity of impacts to specification of covariates

	Main findings			Alternative model (1)			Alternative model (2)		
Measure	Diff.	*p*-value	R^2	Diff.	*p*-value	R^2	Diff.	*p*-value	R^2
Percentage of women who reported having unprotected sex in the past 3 months	-6.6*	0.03	0.08	-5.7	0.07	0.05	5.2	0.10	0.00
Percentage of women who reported receiving information on the following topics in the past 12 months:									
Implant (Implanon)	10.0*	0.02	0.08	10.2*	0.01	0.03	10.1*	0.02	0.01
IUD (Mirena or Paragard)	6.2	0.43	0.07	6.8	0.25	0.03	6.6	0.30	0.02
Percentage of women currently enrolled in school or working part-time or full-time	0.4	1.00	0.08	-0.2	1.00	0.05	-0.4	1.00	0.00
Percentage of women that expect to:									
Attend any schooling after high school	1.9	1.00	0.13	2.1	1.00	0.09	4.2	0.52	0.00
Graduate from a 4-year college	1.7	1.00	0.13	2.7	1.00	0.11	3.8	0.86	0.01
Percentage of women reporting intentions to engage in the following behaviors in the next 12 months:									
Have sexual intercourse	-4.7	0.49	0.11	-4.4	0.55	0.09	-4.1	0.78	0.00
Use LARC if having sex	0.0	1.00	0.13	0.6	1.00	0.11	1.1	1.00	0.00
Use condoms if having sex	-1.4	1.00	0.11	-1.7	1.00	0.07	-0.9	1.00	0.00
Use protection method other than condoms if having sex	-3.7	0.49	0.07	-4.4	0.19	0.03	-4.0	0.33	0.01
Percentage of women reporting that they are “sure” they will not be pregnant again before their child turns 2	3.3	1.00	0.05	2.8	1.00	0.04	2.6	1.00	0.00

Source: Baseline and follow-up surveys administered by the study team.

Notes: For each outcome, the numbers in the columns labeled “Diff.” indicate the regression-adjusted average difference in outcomes between the treatment and control groups. Reported *p*-values are adjusted for multiple outcomes measured within a single domain.

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

For most outcomes, using the alternative combinations of control variables did not change the direction, general magnitude, or statistical significance of the reported impact estimates. The one exception is for the estimated program impact on rates unprotected sex. When estimated with a reduced set of covariates, the favorable program impact on this outcome loses statistical significance, a result of modest declines in both the magnitude and the precision of the estimate (reflected in the lower R^2 statistic for the model). To illustrate these results, we present findings for a subset of outcomes in Table C.1.

C. Alternative coding of education and employment measures

As described in Chapter III, to measure school or work engagement, we combined responses from two survey questions to create a single binary (yes/no) indicator of whether a participant reported being in school or working. To examine the sensitivity of results to an alternative coding scheme, we also examined the impacts of the *AIM 4 Teen Moms* on two separate measures of school or work engagement: (1) a binary (yes/no) indicator that compares participants who are enrolled in school to participates who are not enrolled in school, and (2) a binary (yes/no) indicator that compares participants who are working to participants who are not working. We found no statistically significant program impacts on either of these two measures (Table C.2), a finding consistent with our main results presented in Chapter IV.

Table C.2. Sensitivity of impacts on education and employment measures

Measure	Treatment group	Control group	Difference	*p*-value
Percentage of women currently enrolled in school[a]	73.2	70.1	3.1	0.91
Percentage of women working part-time or full-time	19.8	20.3	-0.4	1.00
Highest level of education expected to complete (single item, range: 1–4)	2.4	2.3	0.1	0.76

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 12-month follow-up survey. Sample sizes accounting for item nonresponse range from 787 to 795 depending on the measure. Reported *p*-values are adjusted for multiple outcomes measured within a single domain. See Chapter III for a more detailed description of the analytic methods and Appendix B for a more detailed description of each measure.

[a] The following schools are considered: middle or high school, continuation/alternative school or court/community school, adult education classes, technical or vocation school, 2-year college, and 4-year college or university.

We also examined the sensitivity of results to the coding of the outcome for educational aspirations. For this outcome, the survey asked participants, "What is the highest level of education you expect to complete?" The five possible response categories were "graduate from high school or obtain a GED," "attend technical or vocational school," "graduate from a 2-year community college (associate's degree)," "graduate from a 4-year college (bachelor's degree), or "obtain a graduate degree (master's, Ph.D., M.D., etc.)." For the main findings presented in Chapter IV, we used the responses to create two separate measures of educational aspirations: (1) a binary (yes/no) indicator of whether the participant expected to attend postsecondary school after graduating from high school, and (2) a binary (yes/no) indicator of whether the participant expected to graduate from a 4-year college or obtain a graduate degree. To examine the sensitivity of results to an alternative coding scheme, we estimated program impacts on a continuous, single-item measure ranging from 1 (graduate from high school or obtain a GED) to 4 (obtain a graduate degree), with higher values indicating greater educational aspirations. For this measure, we combined the responses "attend technical or vocational school" and "graduate from a 2-year community college," as full-time wage workers at either level of education have similar earnings. Consistent with our main results presented in Chapter IV, we found no evidence of statistically significant impacts of the program using this alternative coding scheme.

D. 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. As shown in Table C.3, we found similar results for both reference periods.

Table C.3. Sensitivity of impacts on contraceptive use to reference period

	Past 3 months		Past 12 months	
Measure	Diff.	*p*-value	Diff.	*p*-value
Percentage of women who reported having sexual intercourse without using each of the following:				
Any LARC[a]	-3.4	1.00	0.3	1.00
Implant	-4.3	1.00	-1.6	1.00
IUD	-0.4	1.00	0.0	1.00
Condom	-2.9	1.00	-4.0	1.00
Birth control pills	0.4	1.00	-0.3	1.00
The shot (Depo-Provera)	-1.0	1.00	-0.6	1.00
The patch	-1.1	1.00	-0.6	1.00
The ring (NuvaRing)	-1.0	1.00	-1.3	1.00

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 12-month follow-up survey. Sample sizes accounting for item nonresponse range from 673 to 797 depending on the measure. Reported *p*-values are adjusted for multiple outcomes measured. Chapter III contains a more detailed description of the analytic methods.

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

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