



# Male Involvement in Family Planning:

## The Estimated Influence of Improvements in Condom Use and Efficacy on Nonmarital Births among Teens and Young Adults

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**Male Involvement in Family Planning: The Estimated Influence of Improvements in Condom Use and  
Efficacy on Nonmarital Births among Teens and Young Adults**

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## Abstract

**Context:** Research and programs are increasingly recognizing the role of male involvement in family planning decision-making. Yet limited research has examined how improved condom use and consistency among couples can help reduce high rates of nonmarital pregnancy and childbearing among teens and young adults.

**Methods:** This research uses FamilyScape 2.0, a microsimulation model of family formation, to estimate the effects of increasing the prevalence and effectiveness of condom use among sexually active men on the incidence of nonmarital pregnancy, abortion and childbearing, as well as on rates of child poverty. These models are informed by analyses of the 2006-2010 National Survey of Family Growth (to provide a descriptive reproductive portrait of young men and estimates of condom use failure rates) and a review of evidence-based pregnancy prevention programs that found impacts on condom use.

**Results:** Simulations to increase condom use and effectiveness produced substantial reductions in the number of pregnancies, abortions, and births to unmarried young couples. Declines in nonmarital birth rates ranged from 23 to 47 percent for simulations that moved non-users to users, and between 11 and 36 percent for simulations that increased condom use effectiveness among current users. Abortion rates declined by between 10 and 48 percent across the simulations. Notably, simulations modeling improvements in male contraceptive behavior also reduced child poverty.

**Conclusions:** These simulation findings indicate that improvements in male method use and consistency can have a dramatic impact on reducing nonmarital births and child poverty, and, based on previous research, potentially increase levels of father involvement and child well-being into the next generation.

## Overview

Nonmarital birth rates among teens and young adults in the U.S. are high, particularly among low income and racial and ethnic minority populations. Increased contraceptive use is central to future reductions in nonmarital births. Although an extensive literature has examined contraceptive use among women, much less has looked at men. However, research and programs are increasingly recognizing that male partners who use condoms consistently can help prevent unwanted pregnancies and sexually transmitted infections (STIs) in their relationships.

This paper makes three critical contributions to the literature. First, it describes patterns of pregnancy intentions, condom use, and fertility among unmarried young men aged 15 to 24. Second, it describes the existing program approaches that have shown impacts on condom use and consistency among young men. Third, it employs FamilyScape, an innovative microsimulation model developed by the Brookings Institution and Child Trends, to project how improvements in condom use and effectiveness may impact reproductive outcomes--including nonmarital pregnancy, abortion, and childbearing--and child poverty. Throughout, we examine variation in condom use among men--comparing teens and young adults, race/ethnic groups, and various socioeconomic groups.

This research will help improve program efforts to involve males in reproductive health decision making, thus helping to reduce high rates of early and nonmarital pregnancy and childbearing. Additionally, this research demonstrates the utility of FamilyScape to inform a wide range of policy and programmatic decisions related to contraceptive use, unintended pregnancy, abortion, and childbearing. Finally, this research helps illustrate important links between preventing nonmarital childbearing and improving child outcomes.

## Background

### Implications of early and nonmarital births

More than half of all births to women under age 30 occur outside of marriage, and many of the fathers of these children are in their teens and twenties as well. Most nonmarital births are unintended, which is to say that they either occur too soon or are unwanted. Although limited research examines birth intendedness among males, one recent study found that teen and young adult men are more likely than older men to categorize the recent births of their children as unintended, as were African American men compared with other race/ethnic groups.<sup>26</sup> Young unmarried fathers are less likely than other fathers to live with their child. For example, less than half of teen fathers live with their first child at the time of the child's birth, and among those fathers, it is projected that only a quarter of them will be living with the child when the father is in his early twenties.<sup>36</sup> Because living apart from a father is negatively associated with child well-being (and father involvement is less beneficial for children when the father lives outside the household), the fact that most teenage fathers are unmarried can explain a portion of their children's compromised development.<sup>6,30</sup> Unmarried men and those who have children at younger ages are also more likely to go on to have children with new partners (multiple-partner fertility) than are men who are older or are married when they have their first child.<sup>23</sup>

The links between all of these factors-- early and nonmarital childbearing, unintended childbearing, multiple partner fertility, and nonresidential fatherhood --and a variety of adverse outcomes for children and their parents have been well-documented. Children born outside of marriage tend to trail their peers in school achievement, social and emotional development, and success in the labor market.<sup>28,43</sup> These patterns also hold for unmarried parents; poverty rates are four to five times higher among female-headed families than among married-couple families.<sup>12</sup> Among teens and young adults, unintended childbearing is associated with lower rates of high school graduation and higher levels of unemployment and welfare dependency, even after controlling for a host of socioeconomic and

background characteristics.<sup>5</sup> Perhaps unsurprisingly then, it has also been shown that reducing the incidence of early and unintended childbearing could help reduce expenditures on public programs such as Medicaid.<sup>37,38</sup>

Prior research also suggests that subsequent births in adolescence and young adulthood can further reduce young fathers' opportunities for educational attainment and economic stability, which are linked to children's life prospects.<sup>35</sup> The disadvantages for children may be compounded when young fathers have children with new partners, as multiple-partner fertility is negatively linked to child well-being.<sup>4,7</sup>

The causal nature of much of the above research, however, remains uncertain. There is evidence that many of the associations between age or marital status at birth and child or adult well-being may be overstated, in part because the circumstances at birth may be due to men's prior disadvantage as much as causing disadvantage. In an attempt to better tease out these relationships, recent research (focusing on women) has incorporated various methodological approaches to better identify causal associations between early and nonmarital childbearing and the later well-being of children and adults. For example, several studies have controlled for family background through sibling or twin fixed-effect models, which does reduce the observed negative effects of teenage childbearing on child and adult outcomes.<sup>9,10,16,19,21,42,44</sup> Other researchers have exploited the quasi-randomness of miscarriages to identify the causal impact of a teen birth.<sup>i</sup> While these miscarriage studies continue to find negative effects of adolescent childbearing, the effect sizes are relatively small, suggesting that part of the observed correlations between early and nonmarital parenthood and adverse maternal and child outcomes is driven by pre-existing disadvantages.<sup>15</sup>

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<sup>i</sup> Hotz et al. (2005, 2008),<sup>17,18</sup> the pioneers of this identification strategy, found that teen childbearing had negligible, or even positive, effects on maternal employment and earnings. Results from subsequent studies, which address some of the methodological shortcomings of the Hotz et al. paper, tend to suggest that teen childbearing has small but negative effects on a woman's life trajectory (Fletcher and Wolfe, 2009; Fletcher, 2012; Hoffman, 2008).<sup>1</sup>

Other research suggests that these relatively small effects may only apply to disadvantaged youth, and associations may actually be stronger among women with more advantages. Because adolescents who are at risk of pregnancy also tend to come from highly disadvantaged families and backgrounds, the teens analyzed in the miscarriage and fixed-effects studies may not have the skills, networks, or opportunities to take advantage of a delay in childbearing.<sup>29</sup> Kearney and Levine (2012), for example, have argued that the costs of young motherhood will be small for teens whose future prospects are already severely limited.<sup>20</sup> Other research supports this perspective—for example, finding that women with higher educational attainment and skills have gained the most (in terms of earnings and labor force participation) from historical expansions in oral contraception.<sup>2,3,11</sup> Interestingly, this general connection between the opportunities and costs of the circumstances of childbearing has been reaffirmed at the micro-level by researchers who found, using an instrumental variable approach, that mistimed childbearing had large negative effects on hourly pay and earnings, but that these adverse effects were concentrated primarily among professional and managerial women.<sup>29</sup> While most of this previous research focuses on early and nonmarital motherhood, we anticipate similar effects to young unmarried fathers, as well.

### Importance of condom use for pregnancy prevention

Condoms, one of the only methods of contraception men can be responsible for, are used by a large proportion of teens and young adults in part because condoms are inexpensive, available without a prescription, and prevent against both pregnancy and STIs. Teen and young adult relationships also tend to be shorter and more casual than relationships among older couples – and condom use is higher in these types of relationships.<sup>22,45</sup>

Several evidence-based pregnancy prevention programs target condom use as a key outcome, and many have demonstrated a positive impact on condom use.<sup>27,31</sup> However, condoms must be used consistently and correctly in order to be highly effective at preventing pregnancy. Research finds that

condoms are less effective for pregnancy prevention than “female” contraceptive methods, such as hormonal and long acting contraception, because they are more subject to user error—either not using them at all or using them incorrectly--than are other methods, particularly in the heat of the moment.<sup>13</sup> Thus, increasing the consistent and correct use of condoms among young males has the potential to substantially reduce unintended pregnancies and births among unmarried teens and young adults.

## Analytic approach

A primary goal of this paper is to assess how improved condom use might impact a range of pregnancy, abortion and birth outcomes, and child poverty using a microsimulation approach. This approach requires a series of related analyses that provide overall context as well as the parameters to enter into the microsimulation model. These analyses, described in more detail in the following sections, include:

- **A descriptive reproductive portrait of young men.** We analyzed data from a national sample of young men to assess fertility intentions, the prevalence and trends in condom use, the primary reasons for using condoms, the prevalence of first births, and the intendedness of recent births.
- **Review of evidence based pregnancy prevention programs.** We conducted an analysis of existing evidence-based programs (primarily targeted to teens) that show impacts on condom use in order to develop reasonable estimates of the magnitude of this impact.
- **Estimated condom use and effectiveness.** We reviewed condom use failure and effectiveness rates based on perfect use versus typical use, calculated failure rates for young unmarried men, and employed this information as a baseline for the simulation analyses described below.
- **Estimating impacts of improved condom use.** We used FamilyScape 2.0, a microsimulation model of family formation, to estimate the effects of increasing the prevalence and effectiveness of condom use among sexually active men on the incidence of nonmarital pregnancy and birth.

## A Portrait of Condom Use and Fertility among Teen and Young Adult Men in the United States

Using data from the 2006-2010 NSFG, we conducted analyses of condom use, births, and pregnancy intentions among 3,925 unmarried men aged 15-24. For all of these analyses, we explore differences by age, race/ethnicity, and socioeconomic status (based on highest parental education), and report only significant differences ( $p < .05$ ) in the text. Many of these analyses are based on sub-groups of the full NSFG sample of unmarried men:

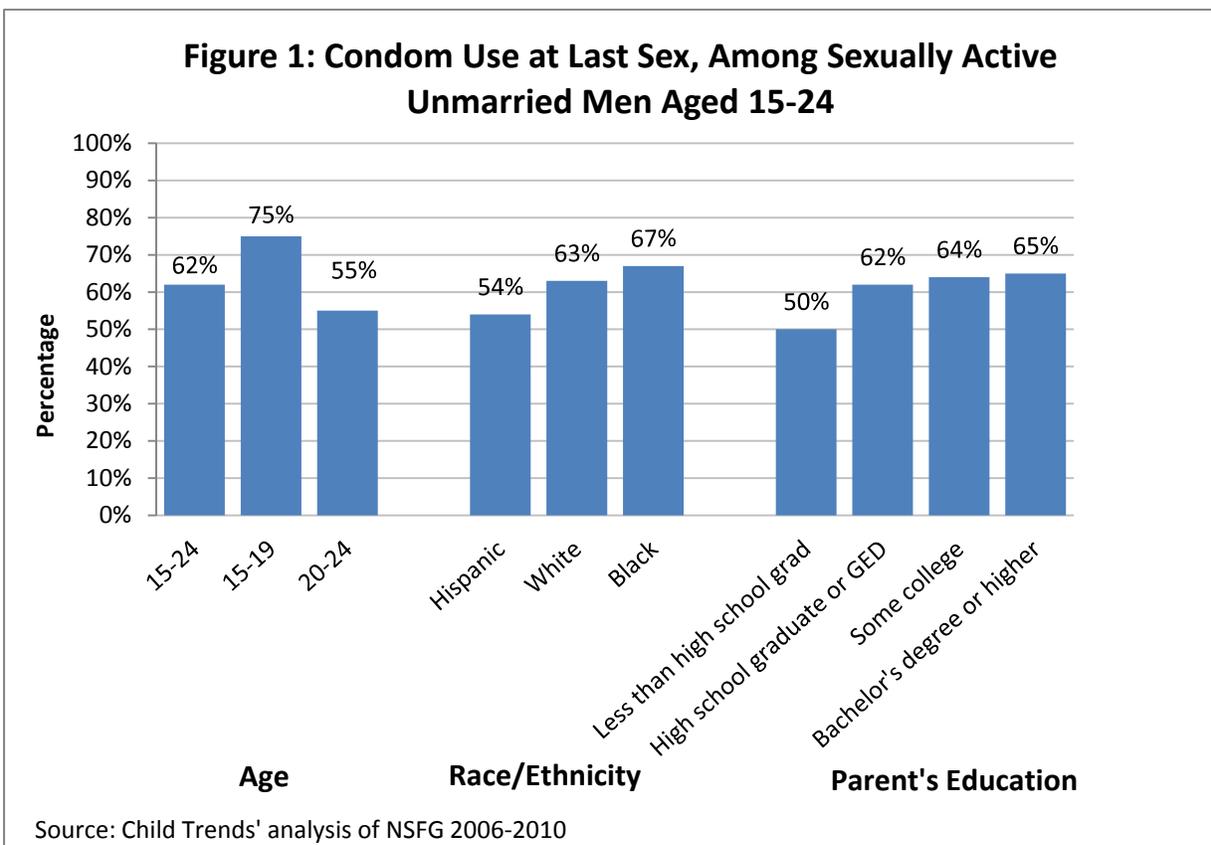
- **Condom use** at last sex was measured among the 1,682 men in this sample who had sexual intercourse in the past three months. We compared condom use and consistency for 2006-2010 with similar data from the 2002 NSFG.
- **Condom consistency** was measured among 1,402 men who had sex in the past four weeks.
- **Reason for condom use** was measured for 1,015 men who used condoms at last vaginal intercourse in the past three months.
- **Attitudes about getting someone pregnant** was measured for a subsample of 2,074 unmarried men aged 15-24, regardless of their sexual activity, who were not sterile and whose wife or cohabiting partner, if any, was not sterile.
- **Fertility.** We the prevalence of having ever fathered a biological child for the full sample of unmarried men aged 15-24 ( $n=3,925$ ), which includes those who had never had sex.
- **Fertility Intentions** was measured for their most recent biological child, among 220 unmarried fathers aged 15-24 who had fathered a biological child in the past five years.

### Prevalence of Condom Use and Primary Reason for Use

The majority of sexually active unmarried men aged 15-24 reported using condoms at last sex (62%), although use varied by socio-demographic characteristics. Teens were more likely to use condoms than were men aged 20-24 (75% and 55%, respectively) (see Figure 1). Hispanic men reported

lower condom use (54%) than black men (67%).<sup>ii</sup> And young men whose parent(s) never graduated from high school reported lower levels of condom use (50%) than those whose parents had some college education (64%) or a college degree (65%).<sup>iii</sup> Our analyses did not indicate any trend in condom use between 2002 and 2006-2010. However, other research found increases in condom use among teen men since 1995.<sup>27</sup>

Separate analyses (not shown here) indicate that only 55 percent of sexually active unmarried men aged 15-24 reported using condoms consistently in the past month (using condoms every time they had sex), and this percentage is much lower among young adults (49%) than among teens (66%).



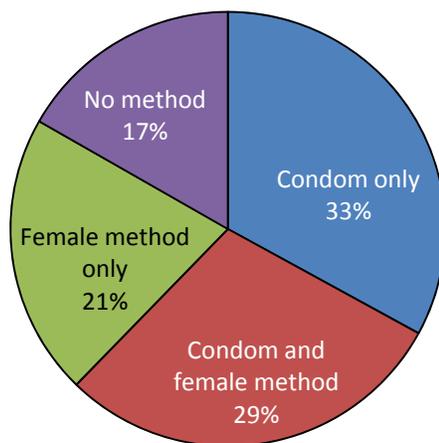
In many cases, condom use is paired with other forms of contraception. Of the 62 percent of young unmarried men who used condoms at last sex, a little less than half reported that their partner

<sup>ii</sup> The racial categories “White” and “Black” represent non-Hispanic whites and non-Hispanic blacks, respectively.

<sup>iii</sup> Parent(s) education is based on highest parental education.

used a female-controlled method, such as oral contraception or an IUD (Figure 2).<sup>iv</sup> Moreover, of the 38 percent of young unmarried men who did not report condom use at last sex, more than half relied on female methods (21% of the young unmarried men overall reported female-only methods). So, while more than a third of these young adult men did not use a condom at last sex, only about 17 percent failed to use any form of contraception. Interestingly, separate analyses (not shown here) found that unmarried men aged 20-24 are nearly twice as likely to not use any form of contraception (20%) as teenage males are (11%).

**Figure 2: Couple-level Contraceptive Use at Last Sex, Among Sexually Active Unmarried Men Aged 15-24**



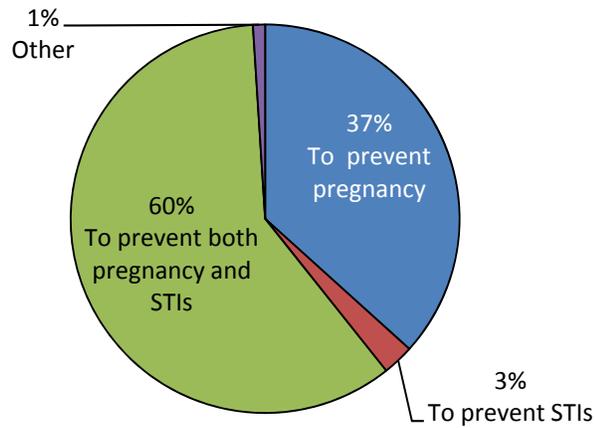
Source: Child Trends' analysis of NSFG 2006-

Note: Female methods include: the pill, patch, and ring; intrauterine devices, hormonal implants, and injectables; spermicidal foams, jellies, creams, films and suppositories; and female sterilization.

Almost all young men (97%) reported that they used condoms for pregnancy prevention, including 37 percent who used condoms for pregnancy prevention alone and 60 percent who used them for both pregnancy and STI prevention (see Figure 3). Another three percent reported using condoms for STI prevention alone and one percent for another reason.

<sup>iv</sup> In Figure 2, withdrawal and natural family planning are included in the no-method category. Female methods include: the pill, patch, and ring; intrauterine devices, hormonal implants, and injectables; spermicidal foams, jellies, creams, films and suppositories; and female sterilization.

**Figure 3: Reason for Condom Use at Last Sex, Among Sexually Active Unmarried Men Aged 15-24**

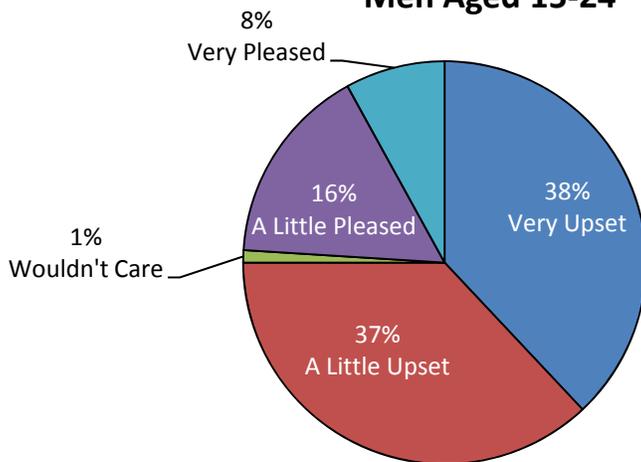


Note: percentages do not add up to 100 because of rounding  
 Source: Child Trends Analysis of NSFG 2006-2010

### Pregnancy Intentions

Our analyses found that most unmarried men aged 15-24 do not want to get a woman pregnant. Three quarters (75%) reported that they would be very upset or a little upset if they got a partner pregnant now (see Figure 4). This percentage is high for all men in the sample, but is higher among teens (81%) than young adults (68%).

**Figure 4: Pregnancy Attitudes Among Unmarried Men Aged 15-24**



Note: Response to the question "If you got a female pregnant now how would you feel? Would you be very upset, a little upset, a little pleased, or very pleased?"  
 Source: Child Trends analyses of NSFG 2006-2010

## Prevalence and Intendedness of Births to Teen and Young Adult Men

Relatively few unmarried men aged 15-24 have fathered a child (7%), although some underreporting of births is to be expected (see Figure 5).<sup>v, 33</sup> As shown in the blue-shaded portion of the bars in Figure 5, two-thirds of the most recent births to unmarried men were classified as unintended -- that is, mistimed or unwanted. This translates to approximately five percent of all unmarried men aged 15-24 reporting that they had an unintended birth.

Not surprisingly, unmarried males aged 20-24 are more likely to report having had a child (12%) than unmarried teen males (2%). However, a lower proportion of recent births to young adult men (65%) were reported as unintended than births to teens (81%).

White men (4%) were less likely to report having had a baby than Black (13%) and Hispanic (12%) men.<sup>vi</sup> However, when white men did have children, they were more likely to be unintended than children born to fathers of other races/ethnicities. Three-quarters of births to white men (74%) were reported as unintended while less than two-thirds of recent births to Hispanics were (64%).

The proportion of men reporting a birth decreases with increased parental education, from 19 percent among those whose parent(s) never finished high school to only two percent among those whose parent(s) completed college. However, the likelihood that a recent nonmarital birth is unintended is linked to the level of education the father's parent(s) have obtained. Men whose parents completed high school or college were more likely to report their child's birth was unintended (70-80%) than men whose parents did not complete high school or obtain a GED (48%).

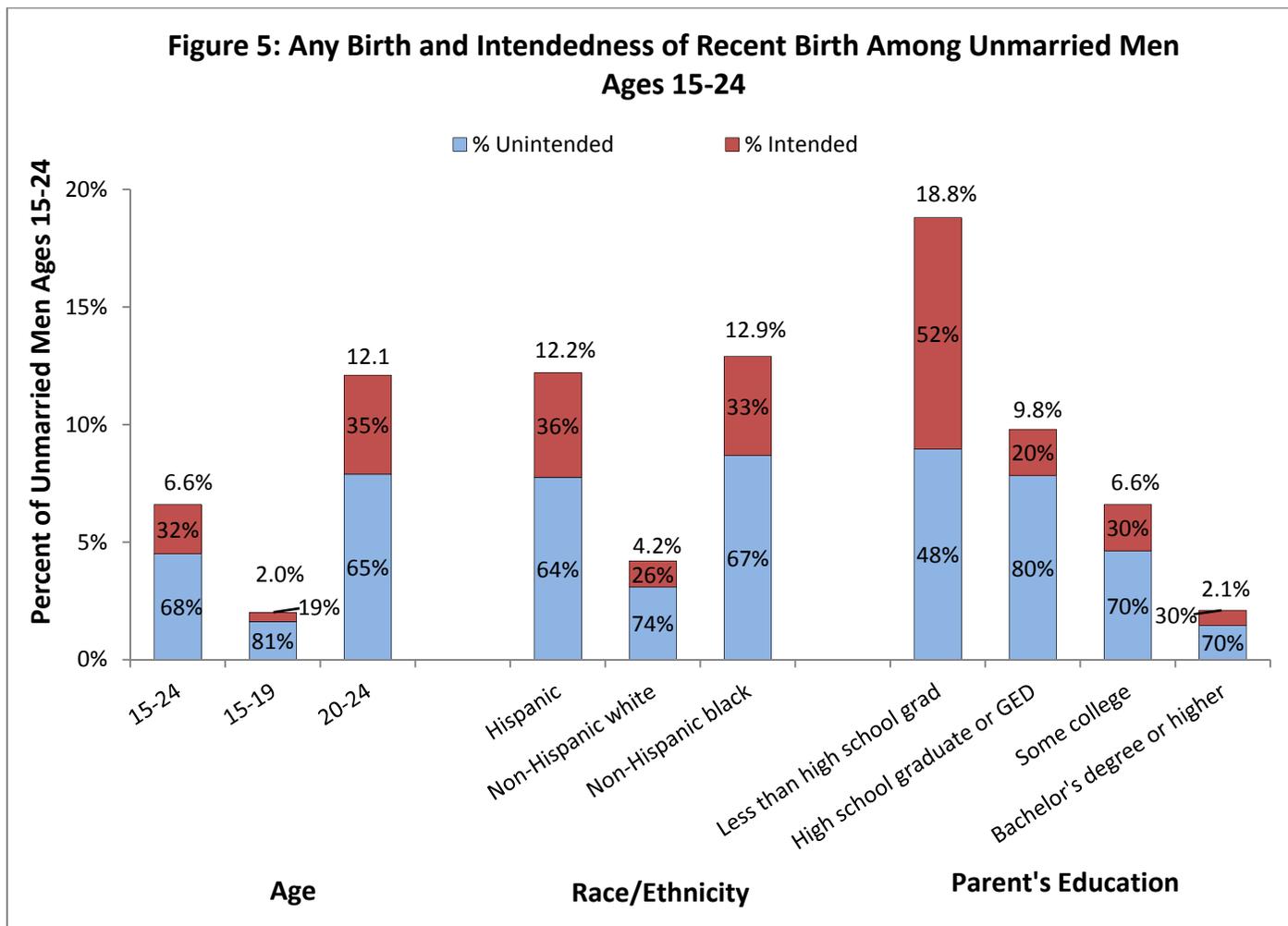
The majority of these fathers – 81 percent – fathered only one child (results not shown). Also, most of the unintended births reported by men in our sample were mistimed rather than unwanted.

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<sup>v</sup> To counteract the underreporting of male fertility (particularly nonmarital fertility), males in the NSFG report full fertility histories in the context of their relationships with women and their children.

<sup>vi</sup> Black men (30%) were also much more likely than other groups to report having two or more biological children (results not shown).

Among all unmarried men aged 15-24 with a birth in the past year, 55 percent said their last child’s birth was mistimed compared to 12 percent who said it was unwanted (results not shown).



## Impacts of evidence-based programs on condom use

We now synthesize information about existing evidence-based programs that show impacts on condom use. We rely primarily on information related to programs targeting teen populations. Drawing from [Child Trends’ LINKS database](#) of experimentally evaluated social interventions designed for children and youth<sup>8</sup> and the Office of Adolescent Health’s *Evidence-Based Programs* database,<sup>31</sup> we identified 70 programs that were rigorously evaluated through a randomized-controlled trial and that measured impacts on condom use or consistency. Thirty-three of these programs showed statistically

significant positive impacts on condom use or consistency in at least one follow up round.<sup>vii</sup> After excluding 37 programs that did not find an impact on condom use and 15 program evaluations that did not provide the statistics necessary to compute a percentage increase in method use, the final sample included 18 programs that showed positive impacts and reported effect sizes, 14 of which had impacts on condom use (shown in Appendix Table 1) and seven of which had impacts on condom consistency (shown in Appendix Table 2); three programs showed impacts on both condom use and consistency.

For each of these programs, Appendix Tables 1 and 2 report the level of condom use at baseline for the treatment and control groups, and use at the follow-up that showed the largest effect size. Thus, this review highlights the largest possible demonstrated impacts on condom use to be used in our “what if” simulations. Appendix Tables 1 and 2 present the magnitude of the effect by calculating the control ratio. This measure assesses condom use for the treatment group relative to the control group at follow-up. The 14 programs that showed impacts on condom use have a wide range of treatment to control ratios, from 8 to 79 percent. Of the seven evaluations that reported a positive impact on consistency of condom use, the evaluations demonstrated a 23 to 83 percent treatment to control ratio.

Our review identified a variety of program approaches that have found impacts on condom use and consistency. Effective programs are available across age groups, settings, and implementation components. Of the 33 programs that showed a positive impact on condom use or consistency, the majority used a comprehensive sex education approach that combined abstinence education with information about contraception or condoms (17 programs) or a clinic-based approach (8 programs). Very few successful programs used other approaches, including only one effective abstinence-based program, one youth development program, three risk reduction programs that focused on reducing risky behaviors such as school dropout, violence, or substance use, and three parent-child

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<sup>vii</sup> Programs were included more than once if they had several published evaluations.

communication programs.<sup>viii</sup> We also examined additional program components, and found that 11 of the effective programs included a family/parent component, six held booster sessions after the main program had ended, and three used service learning in their programs.

Most of the successful programs were shorter in duration and intensity, with 20 lasting less than three months and 16 including less than 10 contact hours with program youth. Programs found impacts on condom use with a variety of age groups, including 15 programs that showed impacts with youth in middle school or ages 10-13, 18 programs that were effective with younger high school students (aged 14-15), and 22 programs that showed impacts on condom use among older high school students or youth 16 or older. These successful programs also operated in a wide variety of settings, with 10 in schools, 13 in clinics, eight in community-based organizations, and seven in other settings, such as the home, juvenile justice facilities, or radio and television ads. Modes of delivery varied, but most of the successful programs involved interactive activities (27), were group-based (26), incorporated technology (20) (usually videos), and incorporated psychosocial skill-building (25) or behavioral skill-building (19).

## **Condom Use Failure Rates / Effectiveness for Pregnancy Prevention**

Condom use failure rates provide information on the probability that women who rely on condoms as their primary contraceptive method will experience an unintended pregnancy during the first year of use. Typical use failure rates rely on data for all users of the method in question regardless of the consistency and correctness with which they use that method over time, while perfect use failure rates document the probability of pregnancy if couples used that method properly every time they had sex in a typical year. The FamilyScape simulation model uses analyses of NSFG person-month calendar data on sexual activity, contraceptive use, and pregnancy to differentiate typical method-use failure rates based on sample demographics, including age, race/ethnicity, and marital status.<sup>39</sup>

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<sup>viii</sup> Please contact the authors for more specific information.

Table 1 documents dramatic differences in condom use failure rates among unmarried women (contraceptive calendars were not available for men in the NSFG, so we rely on women’s reports). For NSFG condom failure rates reported below, a condom user is identified according to the most effective method reported by NSFG female respondent in a given month. The first row shows higher failure rates for young unmarried men (under 25) of all race/ethnic groups among all men (18%, as reported in *Contraceptive Technology*).<sup>13</sup> In the under-25 unmarried group, failure rates are higher among Hispanics (28%) and blacks (31%) than whites (20%). The perfect use failure rate is only 2 percent.

These estimates indicate that there is room for improvement in reducing condom use failure rates among young unmarried men seeking to avoid pregnancy.

**Table 1. Adjusted contraceptive method failure rates among unmarried men, by age and race/ethnicity**

	White	Black	Hispanic	Typical use, full population <sup>13</sup>	Perfect Use <sup>13</sup>
<b>Condom use among unmarried men &lt;25</b>	20%	31%	28%	18%	2%
<b>Condom use among unmarried men 25-29</b>	13%	20%	18%	18%	2%

## The FamilyScape 2.0 Simulation Model

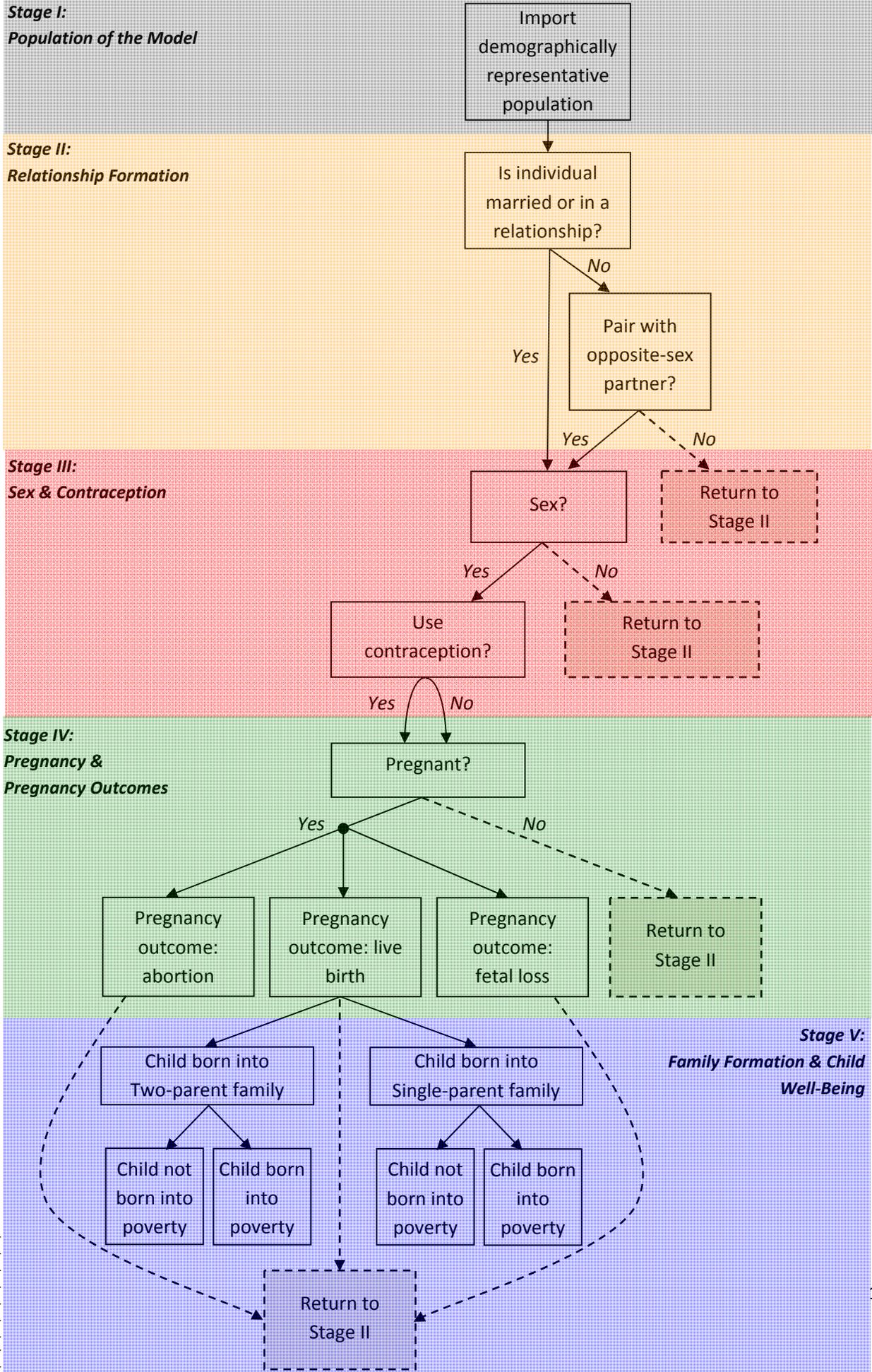
FamilyScape 2.0 is a microsimulation tool that allows the user to model the impacts of behavioral changes on family-formation outcomes. It simulates the key antecedents of pregnancy (sexual activity, contraceptive use, and female fecundity) and many of its most important outcomes (e.g., pregnancy and childbearing within and outside of marriage, children’s chances of being born into poverty, and abortion). The model’s parameters were developed through extensive analysis of a wide range of real-world data sources, though most parameters were estimated using data from the 2006–2008 cycle of the National Survey of Family Growth. Behaviors and outcomes are simulated at the individual level and then aggregated to produce population-wide estimates of various phenomena of interest. The members of the model’s simulation population are heterogeneous: each of them is

assigned a set of demographic and behavioral characteristics that help govern the decisions they will make over the course of the simulation. More specifically, the model is populated with a group of men and women aged 15-44 whose gender, age, race, education, socioeconomic-status (SES), and marital-status profiles are consistent with the characteristics of members of a nationally-representative dataset.

FamilyScape 2.0 has a daily periodicity, which is to say that each increment in analysis time corresponds to a single day. As is the case in the real world, individuals within the simulation behave autonomously and often inconsistently. For example, some individuals in the model will be more inclined than others to have sex on a given day, and a given individual will be willing to have sex on some days but not on others. Each of FamilyScape's inputs (relationship formation, sexual activity, contraceptive use, etc.) is simulated so as to ensure that aggregate measures of the resulting behaviors are consistent with demographically specific benchmarks that were produced via extensive analysis of several different data sources.

Figure 6 diagrams FamilyScape's overall structure and delineates the various stages of the simulation. During the first stage, the model is populated with a group of individuals aged 15 to 44 whose demographic characteristics are nationally representative. In the second stage, opposite-sex relationships of varying duration are formed among some individuals. In the third stage, sexual activity (or a lack thereof) is simulated among married and unmarried couples, and contraceptive use (or a lack thereof) is simulated among couples who have sex. With regard to the contraceptive-use module, the model simulates the use of condoms, sterilization, or no method among men; and of hormonal methods, LARCs, sterilization, or no method among women. FamilyScape 2.0 also contains a contraceptive switching module that allows women to change from the use of one method to another (including switching to or from the use of no method) as the simulation proceeds. In addition, the model captures heterogeneity in the consistency and correctness of contraceptive use. This heterogeneity is simulated by allowing for variation in the efficacy levels of various contraceptive methods.

**Figure 6: Summary Diagram of the FamilyScope 2.0 Simulation Model**



Breakups and Contraceptive Switching: At any point during the simulation, unmarried couples may break up. In addition, women may switch methods as the simulation proceeds.

Demographic Variation: Most behaviors and outcomes vary by sex, age, race, socioeconomic status, educational attainment, and marital status.

In the fourth stage of the simulation, some sexually active couples become pregnant, and each pregnancy eventually results in a birth, an abortion, or a fetal loss (i.e., a miscarriage). The model's fifth and final stage accounts for the fact that each birth is either to a married couple or to a single mother. As a function of the structure of the family into which each child is born and of his or her mother's demographic characteristics, a poverty status is also assigned to each newborn child during the model's final stage.

All of the model's input dynamics are aligned to real-world benchmarks that were produced via analysis of a wide range of external data sources. FamilyScape is designed to produce demographic variation in these dynamics that is similar to the equivalent variation that is observed in the real world. The model generally does a good job of replicating real-world outcomes of interest, especially for the unmarried population. For instance, the real-world pregnancy rate among unmarried women is only about 1 percent higher than the simulated rate of pregnancy for the same group. FamilyScape lends itself readily to policy simulations, since its parameters can be changed relatively easily under the assumption that a given intervention has an effect on individual behavior. As an example, if one believes that a policy has a particular effect on contraceptive use, that effect can be simulated at the individual level by altering the model's baseline behavioral parameters, and the policy's impacts can then be estimated on (say) the number of teenage pregnancies, the frequency of out-of-wedlock childbearing, the incidence of abortion, and so forth. See Thomas et al. (2013) for further information on the architecture of FamilyScape simulation model.

## Simulation Specifications and Underlying Assumptions

We use FamilyScape 2.0 to assess two broad strategies for improving condom use and reducing nonmarital pregnancy: (1) moving non-users to using condoms, and (2) improving the efficacy of methods being used by current condom users. Specifically, we simulate four "what-if" scenarios that target the condom use behaviors of unmarried teen and young adult men. The first two simulations

assess the potential impact of moving non-users to using condoms. Based on our synthesis of programs that have shown impacts on condom use, we propose two scenarios:

1. What if 50 percent of unmarried men aged 15–24 who currently do not use condoms begin using condoms continuously for a year?
2. What if 100 percent of unmarried men aged 15–24 who currently do not use condoms begin using condoms continuously for a year?

The second set of simulations assesses the potential impact of changing the efficacy of condom use among current users. These simulations model reductions in pregnancies, abortions, births and child poverty rates based on “what if” scenarios that apply typical use and perfect use failure rates for condoms:

3. What if condom-using unmarried men aged 15-24 all had the typical use failure rates of men from all age groups combined (18%)?
4. What if condom-using unmarried men aged 15-24 all had perfect use failure rates (2%)?

FamilyScape 2.0 is uniquely well-equipped to perform these types of simulations and can provide unique insights into how to reduce nonmarital pregnancy at the national level.

## Simulation Results

Table 2 shows that increasing condom use among young unmarried men would have sizeable effects on nonmarital pregnancy and pregnancy outcomes.<sup>ix</sup> Moving half of non-condom-using unmarried men onto condoms is expected to reduce pregnancy, birth, and abortion among unmarried women under 25 by nearly a quarter, while universal condom use would cut these rates by almost half. Boosting condom use would also have important implications for child poverty.<sup>x</sup> In particular, reducing

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<sup>ix</sup> Because the partners of young, unmarried men are overwhelmingly young, unmarried women, we report changes in nonmarital pregnancy and pregnancy-outcome rates for women aged 15-24.

<sup>x</sup> All pre- and post-intervention pregnancy and pregnancy-outcome rates reported in Tables 2 and 3 were generated using simulated data produced by FamilyScape 2.0. However, the child-poverty findings reported in the

non-condom use by 50 percent is predicted to cut the incidence of newborn poverty a little more than a percentage point; if all unmarried men under 25 used condoms throughout the year, this rate would fall by about 3.5 percentage points, or 12.5 percent.

**Table 2: Moving non-users to using condoms**

	Simulated baseline <sup>a</sup>	(1) Making 50% of non-condom users continuous condom users		(2) Making 100% of non-condom users continuous condom users	
	Pre-Intervention	Post-Intervention	Percent Change	Post-Intervention	Percent Change
<b>Among unmarried women under 25</b>					
<b>Pregnancy rate<sup>b</sup></b>	85.6	65.6	-23.3%	45.2	-47.1%
<b>Birth rate</b>	50.3	38.5	-23.4%	26.5	-47.3%
<b>Abortion rate</b>	23.2	17.7	-23.7%	12.1	-48.0%
<b>Percent of all children born into poverty<sup>c</sup></b>	27.8%	26.2%	-5.7%	24.3%	-12.5%
<sup>a</sup> Simulated results were generated using data from one hundred one-year runs of FamilyScape 2.0. Simulated baseline rates approximate the conditions for an average year in 2006-2008.					
<sup>b</sup> Rates are expressed in terms of thousands of unmarried women aged 15-24.					
<sup>c</sup> While FamilyScape 2.0 closely replicates real-world pregnancy and pregnancy-outcome rates among unmarried women, the model overestimates pregnancy rates among married women. In order to simulate changes in the incidence of poverty among all newborns, we combine simulated changes in the poverty of children born to unmarried mothers with real-world data on poverty rates among children born to married mothers. Specifically, NSFG 2006-2010 data on child poverty and birth data from Martin et al. (2010) were used to calculate pre- and post-intervention child poverty rates. For more details, see footnote viii.					

table were compiled using both simulated and real-world data. This is because, while FamilyScape 2.0 closely replicates real-world pregnancy and pregnancy-outcome rates among unmarried women, the model overestimates pregnancy rates among married women (see Thomas et al., 2013). Using simulated data to calculate the overall incidence of poverty among children born to married and unmarried mothers would therefore understate the true incidence of newborn poverty, since: (1) poverty is less common among births to married women; and (2) FamilyScape’s birth rate among married women is greater than the equivalent real-world rate. We therefore combine simulated data with real-world data in order to model changes in the overall incidence of newborn poverty. More specifically, we use the following equation to compute pre- and post-intervention newborn poverty rates:

$$\text{child poverty rate} = \frac{(\% \text{ children born into poverty})_U * (\# \text{ of births})_U + (\% \text{ children born into poverty})_M * (\# \text{ of births})_M}{(\# \text{ of births})_U + (\# \text{ of births})_M}$$

where  $(\% \text{ children born into poverty})_U$  and  $(\% \text{ children born into poverty})_M$  are the proportions of births to unmarried and married women (respectively) that occur to poor mothers; and  $(\# \text{ of births})_U$  and  $(\# \text{ of births})_M$  are counts of births occurring to unmarried and married women, respectively. We use simulated data from FamilyScape 2.0 to estimate  $(\% \text{ children born into poverty})_U$  and  $(\% \text{ children born into poverty})_M$  for pre- and post-intervention runs; we calculate  $(\# \text{ of births})_U$  and  $(\# \text{ of births})_M$  using NVSS birth-count data published in Martin et al. (2010).

While these two interventions may, at first glance, seem utopian in size, it is important to note that non-condom-using men represent only about 14 percent of sexually active unmarried men under 25 in FamilyScape.<sup>xi</sup> As a result, simulation (1) only intervenes upon roughly 7 percent of the total target population of young unmarried men who are at risk of fathering a child. Viewed from this perspective, the effect sizes reported in Table 2 are strikingly large relative to the scopes of the two interventions, suggesting that increasing condom use is a highly effective strategy for reducing nonmarital pregnancy among young couples.

Table 3 presents results from the simulations that improve contraceptive efficacy while holding constant the number of contracepting men. Because unmarried men under 25 tend to experience higher failure rates than the average condom user, assuming that these men experience the average typical-use failure rate (of 18%) for all condom users leads to modest, but policy-relevant, reductions in nonmarital pregnancy. Specifically, this intervention is predicted to lower nonmarital birth and abortion rates by about 11 and 10 percent, respectively, and to reduce newborn poverty rates by about half a percentage point.

As expected, inducing all condom-using unmarried men under 25 to use their methods perfectly (at 2% failure rates) results in dramatically larger effects. Under this scenario, nonmarital abortion rates among young unmarried women are expected to fall by about a third, which is equivalent to eliminating

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<sup>xi</sup> The reader may be struck by the seemingly small share of men in FamilyScape's simulation population who fall into the "non-condom-use" category. The reason for this feature of the model is that non-sterilized men in the simulation population are in fact assigned to one of three contraceptive categories: conditional condom users, unconditional condom users, and non-condom users. Conditional condom users are men who use condoms only if their partner is not using contraception; unconditional condom users are men who use condoms whether or not their partner is using contraception; and non-condom users never use condoms regardless of their partner's contraceptive behavior. Because many men in the model are designated as conditional condom users, and since many of these men have partners who are using a form of female-controlled contraception, the share of men who did not use condoms at the most recent act of intercourse within the simulation is in fact larger than 14%. Also important is the fact that, if a woman uses both a condom and a more effective method (i.e., oral contraception or a LARC), she is typically counted in published statistics as having used the latter method rather than condoms. For both of these reasons, then, the share of men who fall into one of the two condom-use categories in the model is substantially larger than the share of men and women in survey data who are reported to have used condoms at last intercourse.

roughly 8.4 abortions per 1,000 women in this demographic subgroup. Similarly large declines in nonmarital pregnancy and birth rates are also predicted, while the overall incidence of newborn poverty is expected to drop by about 2.5 percentage points. Taken together then, the results from Tables 2 and 3 suggest that sizeable gains can be realized through expanding and improving condom use among young men.

**Table 3: Improving the efficacy of condom use**

	Simulated baseline <sup>a</sup>	(3) Assuming typical-use condom failure rates		(4) Assuming perfect-use condom failure rates	
	Pre-Intervention	Post-Intervention	Percent Change	Post-Intervention	Percent Change
<b>Among unmarried women under 25</b>					
<b>Pregnancy rate<sup>b</sup></b>	85.6	76.8	-10.2%	54.8	-36.0%
<b>Birth rate</b>	50.3	44.9	-10.8%	32.1	-36.1%
<b>Abortion rate</b>	23.2	20.9	-9.8%	14.8	-36.3%
<b>Percent of all children born into poverty<sup>c</sup></b>	27.8%	27.0%	-2.6%	25.3%	-8.7%

<sup>a</sup> Simulated results were generated using data from one hundred one-year runs of FamilyScape 2.0. Simulated baseline rates approximate the conditions for an average year in 2006-2008.

<sup>b</sup> Rates are expressed in terms of thousands of unmarried women aged 15-24.

<sup>c</sup> While FamilyScape 2.0 closely replicates real-world pregnancy and pregnancy-outcome rates among unmarried women, the model overestimates pregnancy rates among married women. In order to simulate changes in the incidence of poverty among all newborns, we combine simulated changes in the poverty of children born to unmarried mothers with real-world data on poverty rates among children born to married mothers. Specifically, NSFG 2006-2010 data on child poverty and birth data from Martin et al. (2010) were used to calculate pre- and post-intervention child poverty rates. For more details, see footnote viii.

## Discussion

This study makes important contributions to our understanding of condom use among young unmarried men and assesses the potential impact improvements in condom use on nonmarital pregnancy, abortion, childbearing and rates of child poverty. Our analyses of the NSFG indicate that most unmarried men aged 15-24 do not want to get pregnant. Additionally, the majority of young men who have fathered a child report that their most recent birth was unintended. Although condom use is relatively common among young couples, consistent condom use is much less common. Additionally,

those who do use condoms experience high pregnancy failure rates. Thus, there is a continued role for pregnancy prevention efforts focused on improving male condom use.

Our microsimulation analyses allow us to assess the potential gains to continued investments in programs that show impacts on condom use and consistency, as indicated by impacts of increased condom use on reducing rates of nonmarital pregnancy, abortion, and childbearing among unmarried teens and young adults as well as the incidence of poverty among newborn children. These simulations point to the strong role that male involvement in family planning can have. Specifically, simulations to increase condom use and effectiveness produced substantial reductions in the number of pregnancies, abortions, and births to unmarried young couples. Declines in nonmarital birth rates ranged from 23 to 47 percent for simulations that moved non-users to users, and between 11 and 36 percent for simulations that increased condom use effectiveness among current users. As a point of comparison, nonmarital birth rates were 20 percent lower in 1987 than in 2011.<sup>25</sup> Abortion rates declined by between 10 and 48 percent across the simulations. Notably, simulations modeling improvements in male contraceptive behavior also influenced child poverty. Estimated poverty rates among newborn children declined by between eight-tenths of a percentage point and more than three percentage points across these simulations. Although these appear small, it is important to note that SNAP—a program that costs an estimated \$80 billion a year—reduced the poverty rate by only 1.2 percentage points in 2011 and lifted about 3.7 million people out of poverty.<sup>40</sup> These findings help confirm recent research highlighting the cost effectiveness of interventions that boosted condom use among teens.<sup>38</sup>

### Implications of changing non-users to users

The first two simulations highlight the potential impact that increasing condom use among men can have on reducing nonmarital pregnancies, births and abortions, as well as child poverty. Our program review (see Appendix Table 1) identified several pregnancy prevention and STD prevention programs suggests that it is possible to move half of non-users to condom users (which is modeled in

Simulation 1). This first simulation highlights that a relatively small increase in condom use (moving only 7% of non-users to users) is linked to dramatic reductions (of almost 24%) in nonmarital pregnancies, abortions and births – even with the relatively high condom use failure rates in this population (estimated at almost 25% for all unmarried men under age 25 in this simulation). The second simulation assesses the size of impacts under a scenario that moves all non-users to using condoms, which is linked to a reduction of nearly 50 percent in the number of nonmarital pregnancies, abortions, and births within this age group. However, the program review did not identify any programs that moved all non-users to users, so we present the results of this simulation primarily for illustrative purposes. Simulations 1 and 2 also indicate that increases in condom use could lead to 1.5 to 3.5 percentage point reductions in child poverty in the full population.

### Implications of increasing the effectiveness of method use

Our analyses found high failure rates among unmarried teen and young adult men. Based on our calculations, white unmarried young men had failure rates of 20 percent, and African American and Latinos had failure rates of close to thirty percent. These high failure rates likely reflect lower consistency and accuracy of condom use for younger, unmarried men (and men who are more likely to be in poverty) relative to the rest of the population.

Simulations 3-4 modeled increases in the effectiveness of condom use, which led to reductions in nonmarital pregnancies, abortions and births. Simulation 3 models a failure rate of 18 percent, comparable to typical use failure rates for condom use for men of all ages that are reported in *Contraceptive Technology*. This simulation leads to relatively modest reductions (of 7-8%) in nonmarital pregnancies, abortions and births, but we anticipate these improvements in condom use effectiveness could be feasible based on failure rates for men of all ages and the numerous programs that found impacts on condom use consistency (see Appendix Table 2). Simulation 4 models what would happen if condoms were used perfectly (only a 2% failure rate). This simulation shows reductions of more than

one-third in nonmarital pregnancies, abortions and births. However, the feasibility of reducing condom use failure by this amount is quite limited, because very few couples use condoms consistently and correctly. For example, our analyses found that only six in ten unmarried teen and young adult males in the NSFG reported using condoms consistently in the past month. This finding highlights the difficulty of improving the effectiveness of condoms. As noted earlier, typical-use condom failure rates are substantially higher (18%) than perfect-use failure rates (2%) because of the difficulty of achieving effective and consistent use of condoms.<sup>41</sup>

For this reason, a better strategy may be to encourage the partners of condom users to switch to long-acting methods (LARCs), whose failure rates for the typical user are close to zero.<sup>xii</sup> Thus, another interpretation of the substantial effects produced by simulation 4 is that increasing effectiveness—by switching couples from relying on coitus-dependent methods to long-acting methods—can substantially reduce rates of nonmarital pregnancy and childbearing. This finding is supported by the American Congress of Obstetricians and Gynecologists (ACOG), which lists LARCs as a first-line method of choice for women seeking to avoid unintended pregnancy, including teens (ACOG, 2009). One recent initiative—the St. Louis CHOICE project—has shown dramatic increases in the uptake of LARCs and hormonal methods among women at the highest risk of pregnancy, including those who had a recent abortion.<sup>32,xiii</sup> Thus, intensive efforts to increase LARC use are also a feasible approach. However, qualitative research suggests that some men may deter their partners from using long acting methods, which shows the need for interventions (for women and men) to highlight the safety and effectiveness of LARCs.

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<sup>xii</sup> Specifically, the typical- and perfect-use failure rates for Mirena are both 0.2 percent, and the typical- and perfect-use failure rates for ParaGard are 0.8 and 0.6 percent, respectively (Trussell, 2011).

<sup>xiii</sup> In 2009, for instance, roughly 8.5 percent of current contraceptors used IUDs or implants (Finer et al., 2012).

## Effect sizes

Our findings illustrate that moving a relatively small number of non-users to condom use (as shown in Simulations 1 and 2) can be linked to effect sizes that are as high or higher than improving the effectiveness of a much larger number of existing condom users (Simulations 3 and 4). However, transforming non-contraceptors into condom users requires substantial changes in individual behavior, particularly among those men (and their partners) who have the highest rates of nonmarital childbearing—including low-income individuals, racial and ethnic minorities, and those with lower levels of education. Non-use of condoms may be particularly likely among men (and their partners) who are ambivalent about or want pregnancy at an early age, especially among low-income individuals and racial and ethnic minorities.<sup>9,14</sup> For example, one in four young unmarried men in the NSFG sample reported that they would be a little or very pleased if they got someone pregnant, and Hispanic fathers were more likely than other fathers to report that their birth was intended. Still, the large majority of unmarried men do not want to get a partner pregnant, and very few who do have a birth during the teen and young adult years intended to have children at that point in time. Thus, intervention approaches to help line up condom use behaviors with fertility intentions may hold some promise.

Increasing the consistency and effectiveness of condom use among young unmarried men is another promising approach, especially since these men are already using methods to prevent pregnancy and STDs. However, maintaining consistent condom use over time can be difficult. While most teen and young adult men have used condoms at some point, the likelihood of using condoms declines with age and relationship length, as does the likelihood of consistent condom use.<sup>22</sup> Many men stop using condoms when a partner is using more effective hormonal methods for pregnancy prevention; however, the decline in condom use by age and relationship length remains even after controlling for partner method use.<sup>22</sup>

Our program review (Appendix Tables 1 and 2) indicates that a variety of pregnancy prevention programs have demonstrated substantial impacts on condom use and consistency. Research also suggests that greater emphasis must be placed on making programs more tailored and inviting to young males for maximum impact on condom use.<sup>24</sup> Also, some research suggests that improving program approaches to increase access to sex education and family planning services among young men, as well as enhancing attitudes about the benefits vs. costs of condom use, can help improve condom use and consistency.<sup>22</sup>

### Limitations and Future Research

Our analyses have some limitations that could be addressed in future work. First, our simulations increase contraceptive use to varying degrees (ranging, for example, from affecting the behavior of 7 to 14 percent of men in our target population in Simulations 1 and 2 to affecting the behavior of 86 percent of men in our target population in Simulations 3-4), making it difficult to assess the relative impact of different intervention approaches. This, because the scopes vary, it is difficult to make comparisons across simulations. Second, the current model separately identifies female methods of contraception (hormonal, injectables, LARCs) and male methods (condoms/withdrawal) and does not readily identify simultaneously what method(s) both members of a given couple may be using. A future update to the model could attempt to capture couple-level decision-making. Third, we recognize that condom use, nonmarital childbearing, and poverty may be jointly determined by factors that are not included in our model, including perceptions of future opportunity and motivations to prevent pregnancy. We also recognize that unintendedness is a somewhat subjective concept and that there is considerable ambivalence about family planning as a result, especially among the most disadvantaged men and women. For these groups, improvements in condom use must be combined with enhanced opportunities in order to provide teens and young adults with a reason to delay childbearing.

## Linking Reductions in Nonmarital Births to Child Well-Being

Finally, the relatively large reductions in nonmarital pregnancies and births, and substantial reductions in child poverty achieved through these simulations suggest that improvements in condom use in one generation can have an impact on the next generation of children. In particular, delays in fatherhood that are accompanied by improved educational and employment opportunities may lead to higher chances of a marital birth, greater father involvement, and improved well-being for parents and children.

Future research could explore these potential effects by linking the findings and assumptions from these FamilyScape simulations to the Social Genome Model (SGM) – a microsimulation model that tracks the experiences of individuals from birth into adulthood. Recently, Sawhill et al. (2014) used the SGM to simulate how preventing all unintended births would impact children’s lifetime trajectories. Results from these analyses suggest that, while the effects of preventing unwanted children would be modest, delaying the births of mistimed children would substantially improve their life chances.<sup>34</sup> These estimates, however, are not linked to any real world intervention. Consequently, one important expansion of Sawhill et al.’s work would be to link FamilyScape, which has the capacity to simulate real-world contraceptive interventions, to the SGM in order to simulate the intergenerational effects of specific contraceptive programs and policies.

## Conclusion

An increasing number of pregnancy prevention programs are focusing on relationship context and male involvement in contraceptive decision-making. Our findings indicate the improvements in male method use and consistency can have a dramatic impact on reducing nonmarital births and child poverty, and, based on previous research, potentially increase levels of father involvement and child well-being into the next generation.

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# Appendix 1

Appendix Table 1: Impacts of evidence-based program on condom use†

Program name	Program description <sup>1</sup>	Citation	Sample*	Outcome	Baseline Treatment Group %	Treatment % at Follow-Up**	Comparison % at Follow-Up**	Treatment to Control Ratio**
<b>Condom Use at Last Sex (14 evaluations)</b>								
<b>ASSESS</b>	A safe-sex education program for young teens	Boekeloo, B. O., Schamus, L. A., Simmens, S. J., Cheng, T. L., O'Connor, K., & D'Angelo, L. J. (1999). A STD/HIV prevention trial among adolescents in managed care. <i>Pediatrics</i> , 103(1), 107-115.	N=215 ~50% female Aged 12-15 64% African-American 19% White 4% Hispanic 13% Other	Condom use at last sex	<i>Mixed Gender:</i> 75%	<i>Mixed Gender:</i> 92%	<i>Mixed Gender:</i> 57%	<b><i>Mixed Gender: 61 %</i></b>
<b>Condom Intervention with Women</b>	An intervention developed to increase condom use among sexually active young women.	Bryan, A. D., Aiken, L. S., & West, S. G. (1996). Increasing Condom Use: Evaluation of a Theory-Based Intervention to Prevent Sexually Transmitted Diseases in Young Women. <i>Health Psychology</i> , 15(5), 371-382.	N=198 Mean age: 18.6 100% Female 79% White 8% Hispanic 5% Asian American 4% Native American 3% African American 1% Other Race/Ethnicity	Condom use at last sex	Not measured; at baseline they measured % of women who used condom always, it was 14% for treatment and 15% for control	<i>Females:</i> 68%	<i>Females:</i> 43%	<b><i>Females:58%</i></b>
<b>Familias Unidas+Parent-Preadolescent Training for HIV Prevention (PATH)</b>	A parent-centered intervention to prevent adolescent substance use and unsafe sexual behavior	Prado, G., Pantin, H., & Briones, E. (2007). A randomized controlled trial of a parent-centered intervention in preventing substance use and HIV risk behaviors in Hispanic adolescents. <i>Journal of Consulting &amp; Clinical Psychology</i> , 75(6), 914-926.	N=266 Mean age 13.4 128 Male 138 Female 100% Hispanic 40% Native-born 60% Foreign-born	Condom use at last sex (reverse coded from unprotected last sex)	Not enough information provided at baseline.	<i>Mixed Gender:</i> 81%	<i>Mixed Gender:</i> 56%	<b><i>Mixed Gender: 45%</i></b>

Program name	Program description <sup>1</sup>	Citation	Sample*	Outcome	Baseline Treatment Group %	Treatment % at Follow-Up**	Comparison % at Follow-Up**	Treatment to Control Ratio**
<b>Focus on Kids</b>	An AIDS prevention program for low-income African American children.	Stanton, B. F., Li, X., Galbraith, J., Feigelman, S., & Kaljee, L. (1996). Sexually Transmitted Diseases, Human Immunodeficiency Virus, and Pregnancy Prevention: Combined Contraceptive Practices Among Urban African-American Early Adolescents. Archives of Pediatric and Adolescent Medicine, 150, 17-24.  Stanton, B. F., Li, X., Ricardo, I., Galbraith, J., Feigelman, S., & Kaljee, L. (1996). A Randomized, Controlled Effectiveness Trial of an AIDS Prevention Program for Low-Income African-American Youths. Archives of Pediatric and Adolescent Medicine, 150, 363-372.	N=383 Aged 9-15 56% Male African American	Condom use at last sex	<i>Mixed Gender:</i> 75% <i>Males:</i> 77% <i>Females:</i> NS <i>Early Teens:</i> 82% <i>Preteens:</i> NS	<i>Mixed Gender:</i> 85% <i>Males:</i> 85% <i>Females:</i> 86% <i>Early Teens:</i> 95% <i>Preteens:</i> 75%	<i>Mixed Gender:</i> 61% <i>Males:</i> 57% <i>Females:</i> 100% <i>Early Teens:</i> 60% <i>Preteens:</i> 64%	<b>Mixed Gender: 39%</b> <b>Males: 49%</b> <b>Females: NS</b> <b>Early Teens: 58%</b> <b>Preteens: NS</b>
<b>Focus on Kids plus imPACT</b>	An AIDS prevention program for low-income African American children.	Wu, Y., Stanton, B.F., Galbraith, J., Kaljee, L., Cottrell, L., Li, X., Harris, C.V., D'Alessandri, D., & Burns, J.M. (2003). Sustaining and broadening intervention impact: A longitudinal randomized trial of 3 adolescent risk reduction approaches. Pediatrics, 111, e32-e38.	N= 817 Aged 12-16 42% Male 100% African American	Condom use at last sex (reverse coded from unprotected last sex)	<i>Mixed Gender:</i> 78%	<i>Mixed Gender:</i> 85%	<i>Mixed Gender:</i> 71%	<b>Mixed Gender: 20%</b>
<b>Health Belief Model Intervention to Increase Condom Use Among High-Risk Female Adolescents</b>	An intervention based on the Health Belief Model developed to increase condom use among high-risk female adolescents.	Orr, D.P., Langefeld, C.D., Katz, B.P., & Caine, V.A. (1996). Behavior Intervention to Increase Condom Use Among High-Risk Female Adolescents. The Journal of Pediatrics, 128(2), 288-295.	N=112 Aged 14-19 100% Female 54% African American	Ever used condoms in past 6 months (reverse coded from never used condoms)	<i>Females:</i> 54%	<i>Females:</i> 70%	<i>Females:</i> 42%	<b>Females:67%</b>

Program name	Program description <sup>1</sup>	Citation	Sample*	Outcome	Baseline Treatment Group %	Treatment % at Follow-Up**	Comparison % at Follow-Up**	Treatment to Control Ratio**
<b>HIV Prevention for Adolescents in Low-Income Housing Developments</b>	An intervention targeted at the normative social and peer environments of at-risk adolescents.	Sikkema, K.J., Anderson, E.S., Kelly, J.A., Winett, R.A., Gore-Felton, C., Roffman, R.A., Heckman, T.G., Graves, K., Hoffmann, R.G., & Brondino, M.J. (2005). Outcomes of a randomized, controlled community-level HIV prevention intervention for adolescents in low-income housing developments. <i>AIDS</i> , 19(14), 1509-1516.	N=1172 Aged 12-17 Equal numbers of males and females 51% African American 20% Asian 10% East African 5% White 3% Hispanic 3% Ukrainian 2% Russian 1% Native American 5% Other Race/Ethnicity	Condom use at last sex  Program had two treatment groups: the community condition and the workshop condition	<i>Mixed Gender:</i> 76%	<i>Mixed Gender:</i> Workshop condition, short term: 88%; long term: 76%  Community condition, short term: 79%; long term: 77%	<i>Mixed Gender:</i> Short term follow-up: 67%  Long term follow-up: 62%	<i>Mixed Gender:</i> <b>Workshop short term: 31%</b> <b>Workshop long term: NS</b>  <b>Community short term: NS</b> <b>Community long term: 24%</b>
<b>Horizons</b>	An STD/HIV prevention program for sexually active, African American, female adolescents.	DiClemente, R.J., Wingood, G.M., Rose, E.S., Sales, J.M., Lang, D.L., Caliendo, A.M., Hardin, J.W., & Crosby, R.A. (2009). Efficacy of sexual transmitted disease/human immunodeficiency virus sexual risk-reduction intervention for African American adolescent females seeking sexual health services. <i>Archives of Pediatrics &amp; Adolescent Medicine</i> , 163(12), 1112-1121.	N=715 Aged 15-21 100% Female 100% African American	Condom use at last sex	<i>Females:</i> 44%	<i>Females:</i> 53%	<i>Females:</i> 43%	<i>Females:</i> 23%

Program name	Program description <sup>1</sup>	Citation	Sample*	Outcome	Baseline Treatment Group %	Treatment % at Follow-Up**	Comparison % at Follow-Up**	Treatment to Control Ratio**
<b>Keepin' It R.E.A.L.</b>	A set of community-based HIV prevention programs for African American adolescents and their mothers.	Dilorio C, Resnicow K, McCarty F, De AK, Dudley WN, Wang DT, Denzmore P. (2006). Keepin' it R.E.A.L.: results of a mother-adolescent HIV prevention program. Nurs Res, 55(1), 43-51.  Dilorio C, Resnicow K, Thomas S, Wang DT, Dudley WN, Van Marter DF, Lipana J. (2002). Keepin' it R.E.A.L.: program description and results of baseline assessment. Health Education and Behavior, 29(1), 104-23.	N=582 Aged 11-14 60% Males 98% African American	Condom use at last sex	Not reported	<i>Mixed Gender:</i> 100%	<i>Mixed Gender:</i> 85%	<i>Mixed Gender:</i> <b>18%</b>
<b>Making Proud Choices!</b>	A safer-sex approach to HIV/AIDS and teen pregnancy prevention.	Jemmott, J.B., Jemmott, L.S., & Fong, G.T. (1998). Abstinence and Safer Sex HIV Risk-Reduction Interventions for African American Adolescents. Journal of the American Medical Association, 279(19), 1529-1536.	N=659 Mean age=11.8, grades 6+7 53% Female 100% African American	No unprotected sex, past 3 months (reverse coded from had unprotected sex)	Not reported	<i>Mixed Gender:</i> % reporting no unprotected sex: 96%	<i>Mixed Gender:</i> % reporting no unprotected sex: 88%	<i>Mixed Gender:</i> <b>% reporting no unprotected sex: 9%</b>
<b>Project RESPECT</b>	A counseling program for teens and adults designed to prevent sexually transmitted diseases (STDs), including HIV, through condom use.	Kamb, M.L., Fishbein, M., & Douglas, J.M., et al. (1998). Efficacy of risk-reduction counseling to prevent Human Immunodeficiency Virus and sexually transmitted diseases: A randomized controlled trial. Journal of the American Medical Association, 280(13):1161-1167.	N=5833 Median Age= 25, aged 14 and older 3269 females 2489 males 59% African American 19% Hispanic 16% White 6% Other Race/Ethnicity	Condom use at last sex with primary partner Condom use at last sex with other partners Having no unprotected sex past 3 months Any condom use past 3 months	<i>Mixed Gender:</i> Last, primary: Not reported Last, other: Not reported No unprotected: 38% Any use: Not reported	<i>Mixed Gender:</i> Last, primary: 63% Last, other: 79% No unprotected: 46% Any use:83%	<i>Mixed Gender:</i> Last, primary: 58% Last, other: 73% No unprotected: 38% Any use: 76%	<i>Mixed Gender:</i> <b>Last, primary: 9%</b> <b>Last, other: 8%</b> <b>No unprotected: 21%</b> <b>Any use: 8%</b>

Program name	Program description <sup>1</sup>	Citation	Sample*	Outcome	Baseline Treatment Group %	Treatment % at Follow-Up**	Comparison % at Follow-Up**	Treatment to Control Ratio**
<b>REAL Men</b>	A program designed to provide fathers with the skills necessary to communicate with their sons about HIV prevention,	Dilorio, C., McCarty, F., Resnicow, K., Lehr, S., & Denzmore, P. (2007). REAL Men: A Group-Randomized Trial of an HIV Prevention Intervention for Adolescent Boys. <i>American Journal of Public Health</i> , 97(6), 1084-1089.	N=273 father-son pairs Aged 11-14 100% Male 96% African American	Never had unprotected sex (reverse coded from had unprotected sex)	<i>Males: 71%</i>	<i>Males: 77%</i>	<i>Males: 43%</i>	<b><i>Males: 79%</i></b>
<b>Sexual Risk Reduction (SRR) Intervention</b>	A clinic-based prevention program designed to target black female adolescents	Morrison-Beedy, D., Jones, S. H., Xia, Y., Tu, X., Crean, H. F., & Carey, M. P. (2013). Reducing sexual risk behavior in adolescent girls: Results from a randomized controlled trial. <i>Journal of Adolescent Health</i> , 52(3), 314-321. doi:10.1016/j.jadohealth.2012.07.005	N=738 Aged 15-19 100% Female 69% African American	No unprotected vaginal sex, past 3 months (reverse coded from had unprotected sex)	<i>Females: 33%</i>	<i>Females: 32%</i>	<i>Females: 27%</i>	<b><i>Females:19%</i></b>
<b>Sistering, Informing, Healing, Loving, and Empowering (SiHLE)</b>	An HIV-prevention intervention for African American female adolescents	DiClemente, R. J., Wingood, G. M., Harrington, K. F., et al. (2004). Efficacy of an HIV prevention intervention for African American adolescent girls: A randomized controlled trial. <i>Journal of the American Medical Association</i> , 292, 171-179.	N=522 Aged 14-18 100% Female 100% African American	Condom use at last sex	<i>Females: 32%</i>	<i>Females:81%</i>	<i>Females:54%</i>	<b><i>Females:50%</i></b>

\*Evaluation descriptions are cited from the [Child Trends LINKS database](#) and from the [OAH List of Evidence-Based Teen Pregnancy Prevention Programs](#).

\*\* If more than one follow-up, the highest frequency or percent was used to calculate percent increase in condom use.

†The following programs demonstrated a positive impact on condom use or condom consistency but were not included in analyses because they did not provide the statistics necessary to compute a percentage increase in method use: All4You!, Be Proud! Be Responsible! (two evaluations), Familias Unidas (two evaluations), Making a Difference!, Prime Time, Project iMPPACS, Project RESPECT, Respeto/Proteger, Rikers Health Advocacy Program (RHAP), Safer Choices (two evaluations), SHARP: Sexual Health and Adolescent Risk Prevention, Sisters Saving Sisters (HIV/STD Risk Reduction Intervention for Adolescent Girls).

Appendix Table 2: Impacts of evidence-based program on condom consistency†

Program name	Program description <sup>1</sup>	Citation	Sample*	Outcome	Baseline Treatment Group %	Treatment % at Follow-Up**	Comparison % at Follow-Up**	Treatment to Control Ratio**
<b>Condom Use Consistency (7 evaluations)</b>								
<b>Aban Aya Youth Project</b>	A program designed to reduce rates of risky behaviors among African-American children in 5th through 8th grades.	Flay, B. R., Graumlich, S, Segawa, E., Burns, J. L., & Holliday, M. Y. (2004). Effects of 2 prevention programs on high-risk behaviors among African American Youth. Archives of Pediatrics and Adolescent Medicine, 158(4), 377-384.	N= 668 Mean age 10.8 49.5% male	Condom use	<i>Males: 49%</i> <i>Females: NS</i>	<i>Males: 80%</i> <i>Females: 87%</i>	<i>Males: 65%</i> <i>Females: 86%</i>	<i>Males: 23%</i> <i>Females: NS</i>
<b>Becoming A Responsible Teen (BART)</b>	An HIV education and skills training program for African American high school students.	St. Lawrence, J.S. et al. (1995). Cognitive-Behavioral Intervention to Reduce African American Adolescents' Risk for HIV Infection. Journal of Consulting and Clinical Psychology, 63(2), 221-237.	N=246 Aged 14-18 72% Female 100% African American	Percent condom-protected intercourse occasions, past 2 months	<i>Males: 62%</i> <i>Females: 70%</i> <i>Mixed Gender: 67%</i>	<i>Males: 91%</i> <i>Females: 72%</i> <i>Mixed Gender: 83%</i>	<i>Males: 58%</i> <i>Females: 50%</i> <i>Mixed Gender: 62%</i>	<i>Males: 57%</i> <i>Females:44%</i> <i>Mixed Gender: 34%</i>
<b>CenteringPregnancy Plus</b>	A 10-week prenatal care program, delivered in a group setting, which targets pregnant adolescents.	Kershaw, T. S., Magriples, U., Westdahl, C., Schindler Rising, S., & Ickovis, J. (2009). Pregnancy as a window of opportunity for HIV prevention: Effects of an HIV intervention delivered within prenatal care. American Journal of Public Health, 99(11), 2079-2086.	N= 1,047 100% Female Aged 14-25 80% black, 13% Latina, 6% white, 1% mixed/other	Percentage of condom use (average self-estimated percentage of condom use in the past 6 months)	<i>Females: 39%</i>	<i>Females: 51%</i>	<i>Females: 41%</i>	<i>Females:24%</i>
<b>iCuidate!</b>	An HIV risk-reduction curriculum for Latino adolescents	Villarruel, A. M., Jemmott, J. B., & Jemmott, L. S. (2006). A Randomized Controlled Trial Testing an HIV Prevention Intervention for Latino Youth. Archives of Pediatrics & Adolescent Medicine, 160, 772-777.	N=553 Aged 13-18 304 Females,249 Males 85% Puerto Rican, 45% were born outside mainland US	Consistency of condom use, past 3 months (also measured at last sex, but no impact)	<i>Mixed Gender: 47%</i>	<i>Mixed Gender: 43%</i>	<i>Mixed Gender: 26%</i>	<i>Mixed Gender: 65%</i>

Program name	Program description <sup>1</sup>	Citation	Sample*	Outcome	Baseline Treatment Group %	Treatment % at Follow-Up**	Comparison % at Follow-Up**	Treatment to Control Ratio**
<b>Horizons</b>	An STD/HIV prevention program for sexually active, African American, female adolescents.	DiClemente, R.J., Wingood, G.M., Rose, E.S., Sales, J.M., Lang, D.L., Caliendo, A.M., Hardin, J.W., & Crosby, R.A. (2009). Efficacy of sexual transmitted disease/ human immunodeficiency virus sexual risk-reduction intervention for African American adolescent females seeking sexual health services. Archives of Pediatrics & Adolescent Medicine, 163(12), 1112-1121.	N=715 Aged 15-21 100% Female 100% African American	Consistent condom use past 14 days  Consistent condom use, past 60 days	<i>Females:</i> 14 day- 35% 60 day- 23%	<i>Females:</i> 14 day- 50 % 60 day- 41%	<i>Females:</i> 14 day- 39% 60 day- 30%	<i>Females:</i> <b>14 day- 28%</b> <b>60 day- 37%</b>
<b>Making Proud Choices!</b>	A safer-sex approach to HIV/AIDS and teen pregnancy prevention.	Jemmott, J.B., Jemmott, L.S., & Fong, G.T. (1998). Abstinence and Safer Sex HIV Risk-Reduction Interventions for African American Adolescents. Journal of the American Medical Association, 279(19), 1529-1536.	N=659 Mean age=11.8, grades 6+7 53% Female 100% African American	Percent reporting consistent condom use, past 3 months	Not reported	<i>Mixed Gender:</i> % reporting consistent condom use: 66%	<i>Mixed Gender:</i> % reporting consistent condom use: 36%	<i>Mixed Gender:</i> <b>% reporting consistent condom use: 83%</b>
<b>Sistering, Informing, Healing, Loving, and Empowering (SiHLE)</b>	An HIV-prevention intervention for African American female adolescents	DiClemente, R. J., Wingood, G. M., Harrington, K. F., et al. (2004). Efficacy of an HIV prevention intervention for African American adolescent girls: A randomized controlled trial. Journal of the American Medical Association, 292, 171-179.	N=522 Aged 14-18 100% Female 100% African American	Consistent condom use, past 30 days  Consistent condom use, past 60 months	<i>Females:</i> Consistent 30 days: 40%  Consistent 6 months: 44%	<i>Females:</i> Consistent 30 days: 73%  Consistent 6 months: 61%	<i>Females:</i> Consistent 30 days: 57%  Consistent 6 months: 43%	<i>Females:</i> <b>Consistent 30 days: 28%</b>  <b>Consistent 6 months: 42%</b>

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†The following programs demonstrated a positive impact on condom use or condom consistency but were not included in analyses because they did not provide the statistics necessary to compute a percentage increase in method use: All4You!, Be Proud! Be Responsible! (two evaluations), Familias Unidas (two evaluations), Making a Difference!, Prime Time, Project iMPACS, Project RESPECT, Respeto/Proteger, Rikers Health Advocacy Program (RHAP), Safer Choices (two evaluations), SHARP: Sexual Health and Adolescent Risk Prevention, Sisters Saving Sisters (HIV/STD Risk Reduction Intervention for Adolescent Girls).