DOUGLAS KIRBY, PH.D. NOVEMBER, 2007

# Emerging Answers 2007

## Research Findings on Programs to Reduce Teen Pregnancy and Sexually Transmitted Diseases

The National Campaign
to Prevent Teen and Unplanned Pregnancy

National Campaign to Prevent Teen and Unplanned Pregnancy

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**NOVEMBER, 2007**

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*Emerging Answers 2007* is part of the National Campaign's "Putting What Works to Work" (PWWTW) project, an effort to publish and disseminate the latest research on teen pregnancy in straightforward, easy-to understand language and provide clear implications for policy, programs, and parents. PWWTW is funded by the Centers for Disease Control and Prevention (CDC) and is supported by grant number U88/CCU322139-01. Materials developed as part of this project are solely the responsibility of the authors and do not necessarily represent the official views of CDC. The National Campaign wishes to thank the CDC for making *Emerging Answers 2007* possible and for their support of this portion of the National Campaign's research program.

The National Campaign also wishes to thank Blair Potter Burns for her contributions to this volume. Her steady and skilled editing has improved this volume in countless ways. We also thank the Effective Programs and Research Task Force and other individuals for their careful review of this document and helpful suggestions.

Last but certainly not least, we offer special thanks and recognition to author Doug Kirby, Ph.D. When it comes to helping understand what programs work best to prevent teen pregnancy, his contributions are unmatched. We thank him for his scholarship, commitment, fairness, and abiding patience in seeing this project through.

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## FOREWORD

The United States has made extraordinary progress in reducing teen pregnancy and birth rates. More teens are delaying sex and those that are sexually active are using contraception more consistently and carefully. Both of these developments have made important contributions to the impressive decline in teen pregnancy and childbearing.

Recent years have also brought good news on the research front. As Doug Kirby so carefully points out in *Emerging Answers 2007*, the quality and quantity of evaluation research in this field has improved dramatically and there is now more persuasive evidence than ever before that a limited number of programs can delay sexual activity, improve contraceptive use among sexually active teens, and/or prevent teen pregnancy. Of course, this is a very welcome development for all of us who care about the well-being of young people and the next generation of children who deserve to be raised by adult parents.

Over the years, the National Campaign has produced and disseminated a number of detailed reports and publications on such topics as parental influence, the role of peers, media influence, and the costs of teen pregnancy. Still, the question we are asked most frequently is: what *programs* work to prevent teen pregnancy? In *Emerging Answers 2007*—an update of *Emerging Answers* (2001) and *No Easy Answers* (1997)—Dr. Kirby provides some answers to the important question of "what works." We are confident that this review will be as popular and influential as its predecessors.

The National Campaign would like to thank Dr. Kirby for his scholarship and for producing this thorough research review. In particular, we recognize his dogged commitment to being fair and evenhanded in his assessment of the research. In the interest of full disclosure, it should be noted that Dr. Kirby, who is a Senior Research Scientist at ETR Associates, has a well-deserved reputation as a high-quality evaluation researcher. Consequently and not surprisingly, a number of Dr. Kirby's own studies of programs appear in this publication. In addition, Dr. Kirby thought it important to also note that ETR Associates developed and continues to market several of the curricula reviewed in *Emerging Answers 2007*.

Having accurate, research-based information on what works to prevent teen pregnancy is critically important information for communities and practitioners trying to make informed decisions about preventing teen pregnancy. Even so—because teen pregnancy has many causes, and because even effective programs do not eliminate the problem—it is unreasonable to expect any single curriculum or community program to make a serious dent in the problem of teen pregnancy on its own. Making true and lasting progress in preventing teen pregnancy requires a combination of community programs and broader efforts to influence values and popular culture, to engage parents and schools, to change the economic incentives that face teens, and more. Another reason why it is unfair to place the entire responsibility for solving the problem of teen pregnancy on the back of community efforts is that many of these programs—even those deemed effective—often have only modest results, many are fragile and poorly-funded, and

most of these programs serve only a fraction of all the kids in the area who are at risk.

Readers of this review should also consider that even though a program may have been shown to be effective in changing behavior, it is important to think carefully about what an effective program actually can accomplish. Some things to consider:

- ☆ How do *you* define effective? For example, is a program effective if its good results last only a relatively brief amount of time or only among boys? In other words, pay careful attention to the specific results of program evaluation and think carefully about what constitutes success. Is a 10 percent improvement enough? What if a program helps on one issue but makes another issue worse?
- ☆ Consider the magnitude of success. For example, if a program is successful at delaying first sex among participants, how *long* was the average delay? An effective program may only change things a bit.
- ☆ Keep in mind that there may very well be a number of creative programs that are effective in helping young people avoid risky sexual behavior that simply have not yet been evaluated.

As we said in this space in 2001, in the final analysis, professionals working with youth should not adopt simplistic solutions with little chance of making a dent on the complex problem of teen pregnancy. Instead, all should be encouraged by both the impressive declines in teen pregnancy and the growing amount of research showing that some programs can make a difference. Those programs with the best evidence for success should be replicated, new efforts should be built on the common elements of successful programs, and more effort should be given to exploring, developing, and evaluating new and innovative approaches to preventing too-early pregnancy and parenthood.

Sarah S. Brown
CEO
National Campaign to Prevent
Teen and Unplanned Pregnancy

October 2007

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## AUTHOR'S PREFACE

In 1997, I wrote *No Easy Answers: Research Findings on Programs to Reduce Teen Pregnancy* for the National Campaign to Prevent Teen Pregnancy. At that time, with only a few exceptions, most studies assessing the impact of programs to reduce sexual risk-taking by teens failed either to measure or to find sustained, long-term effects on behavior. Of the few studies that appeared to have more than a short-term impact, none had been evaluated two or more times by independent researchers and found to be effective. In general, the research indicated that there were "no easy answers" to markedly reducing teen pregnancy in the United States.

Four years later, I updated the review and wrote *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy.* Those findings were definitely more positive. Larger, more rigorous studies of some sex and STD/HIV education programs had found sustained positive effects on behavior for as long as three years, and one program that combined both sexuality education and youth development (i.e., the *Children's Aid Society-Carrera Program*) reduced both pregnancy and childbearing rates for three years. In addition, both service learning programs (i.e., voluntary community service with group discussions and reflection) and at least one sex and HIV education program *(Reducing the Risk)* had been found to reduce sexual risk-taking or pregnancy in several settings by independent research teams. Finally, there was emerging evidence that some shorter, more modest clinic interventions involving educational materials coupled with one-on-one counseling could increase the use of contraceptives. All of these findings were encouraging.

It is now six years since I wrote *Emerging Answers*, and the number of studies measuring program impact on adolescent sexual behavior has increased by fifty percent. Thus, I am once again updating my review.

Just as the results summarized in *Emerging Answers* were more positive than those in *No Easy Answers*, these new results are more positive than those summarized in *Emerging Answers.* Our field continues to progress. The percentage of sex and STD/HIV education programs with positive effects on behavior continues to increase and the strength of their evidence has also increased. Moreover, there are now several programs that have been evaluated multiple times, and the results suggest that when the original programs are implemented with fidelity in similar settings with similar populations of young people, their positive effects on behavior are also replicated. The common characteristics of effective programs have been expanded to include their development, content, and implementation, and there is greater evidence supporting those characteristics. We also know more about which mediating factors (e.g., knowledge, attitudes, perceptions of peer norms, self-efficacy, intentions, etc.) are changed by the programs and in turn affect behavior. In addition, there is good evidence that interactive video-based and computer-based interventions can be effective and that providing emergency contraception to girls and young women in advance of having sex can increase the use of that emergency contraception. Finally, there is increasing evidence that programs for parents of adolescents can lead to greater parent-teen communication about sexual behavior and to actual changes in adolescent sexual behavior,

especially if the adolescents are also involved in the programs.

Despite these encouraging results, getting young people to delay having sex or to use protection against pregnancy and STD remains a challenge. There are many factors in young people's lives that affect their sexual behavior, for example, their own sexual drive and desire for intimacy, their family's values, their friends' values and behavior, their own attitudes and skills, the media, the monitoring of young people by their community, and opportunities for the future in their community. Most, but not all, of the programs designed to reduce risky sexual behavior are very modest. Thus, when they strive to partially overcome some or all of these other factors, and thereby to change adolescent sexual behavior, they do face a daunting task.

Consequently, none of these programs is a complete solution. Typically, the more effective programs may reduce one or more types of risky behavior by roughly one-third. Just as people can view a glass of water as being two-thirds empty or one-third full, so they should recognize that none of these programs comes close to eliminating sexual risk-taking—and that roughly two-thirds of that behavior may continue to occur. However, given the modest nature of most of these programs, if some of them can reduce risky sexual behavior by roughly one-third, they could have a programmatically meaningful impact on pregnancy and STD rates and should be implemented far more broadly.

Given all of the results from all of the studies, a technically accurate title for this review might have been "Multiple Partial Answers." However, that is not a very catchy title. Furthermore, answers are still emerging and will continue to emerge for years to come, and in many ways this review builds on the research criteria, the organization, and the content of *Emerging Answers*. Accordingly, it is called *Emerging Answers 2007: Research Findings on Programs to Reduce Teen Pregnancy and Sexually Transmitted Disease*.

While most of this review focuses on the effects of programs designed to change risky sexual behavior, it is also true that in recent years, we have learned more about the behavior that affects the transmission of STDs and the risk and protective factors that affect that behavior. Accordingly, this review includes an entirely new chapter on behavior affecting pregnancy and STD transmission.

I hope this review is helpful to your planning and implementation of effective programs.

Douglas Kirby, Ph.D.
September 2007

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# Summary

In the six years since The National Campaign to Prevent Teen Pregnancy published *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy*, the number of studies measuring program impact has increased by 50 percent, their methodological rigor has improved substantially, and additional studies on the behavior that affects teen pregnancy and sexually transmitted disease (STD) as well as the factors affecting that behavior have been published. These developments are heartening because they give a clearer picture of which programs are effective and why. *Emerging Answers 2007: Research Findings on Programs to Reduce Teen Pregnancy and Sexually Transmitted Disease* summarizes all of this research.

Other heartening developments are the continuing declines in teen pregnancy and birth rates, which have now dropped by about one-third since the early 1990s. While many factors undoubtedly contributed to these declines, part of the credit goes to the many, varied pregnancy and STD/HIV prevention programs designed and implemented by dedicated reproductive health and youth development professionals in concert with service agencies, community leaders, teachers, parents, and religious leaders. Even more important, of course, are teenagers' responses to these efforts: slightly larger percentages of teens are delaying having sexual intercourse, and greater percentages of teens are using condoms and other forms of contraception if they do have sex.

Despite this good news, pregnancy and birth rates among U.S. teens remain very high, both relative to other developed countries and in terms of the costs to the teens involved, their children, and society at large. Rates of many reported STDs are also high among U.S. teens.

This review summarizes research results on sexual risk behavior and its consequences. It identifies the particular types of adolescent sexual risk-taking behavior that affect pregnancy and STDs. It provides an overview of important factors that influence such sexual risk-taking. The report goes on to describe the programs and approaches that have reduced teen sexual risk-taking and teen pregnancy or STD. It expands the list of programs with strong evidence of impact, describes the characteristics of effective sex and STD/HIV education programs contributing to their success and provides new evidence for other promising approaches to reducing sexual risk. Finally, *Emerging Answers 2007* describes promising strategies for organizations and communities that want to select, adapt, design or implement prevention programs for their own teens.

This review is not all-encompassing, however. It examines only primary prevention programs: it does not include programs to prevent second pregnancies and births to teenage mothers, although some strategies for avoiding first pregnancies and births apply to later ones as well. Moreover, it does not assess the efficacy of various methods of contraception, and it does not consider same-sex aspects of preventing STDs, including HIV.

## PREVALENCE AND CONSEQUENCES OF SEXUAL RISK-TAKING

When teens become pregnant or contract an STD, they, their children, and society at large often pay a significant price, both in human and in monetary terms. The following statistics describe their sexual activity and show why it is important to improve efforts to prevent sexual risk-taking among teens:

There are still too-high levels of sexual risk-taking among teens:

- ☆ Roughly half (47 percent ) of all high school students in the U.S. report having sex at least once, and close to two-thirds (63 percent ) report having sex by the spring semester of their senior year of high school. This behavior puts them at risk of both pregnancy and infection with an STD.
- ☆ Although 80 to 90 percent of teens report using contraception the most recent time they had sexual intercourse, many teenagers do not use contraceptives carefully and consistently. Among 15- to 19-year-old girls relying upon oral contraceptives, only 70 percent take a pill every day.

This unprotected sexual activity leads to high pregnancy and birth rates among teens:

- ☆ About 75 of every 1,000 girls age 15 to 19 became pregnant in 2002 (the last year for which data are available), which means that, cumulatively, more than 30 percent of teenage girls in the United States become pregnant at least once by the age of 20. Despite declines in all major racial/ethnic groups, there remain large racial/ethnic disparities in these rates. In absolute numbers, about 764,000 girls of all racial/ethnic groups under age 20 become pregnant each year. More than 80 percent of these pregnancies are unintended.
- ☆ About 40 of every 1,000 girls age 15 to 19 gave birth in 2005 (the last year for which data are available). This is important because births to teens have negative consequences for the mothers and their children. Despite recent declines in overall birth rates to teens, the percentage of births to unmarried girls under age 20 has risen dramatically, reaching 83 percent in 2005. This is important because births outside of marriage generally have more negative consequences for both mothers and their children.
- ☆ Teenage mothers are less likely to complete school, less likely to go to college, more likely to have large families, and more likely to be single—increasing the likelihood that they and their children will live in poverty. Negative consequences are particularly severe for younger mothers and their children.
- ☆ Children of teenage mothers are likely to have less supportive and stimulating home environments, lower cognitive development, less education, more behavior problems, and higher rates of both incarceration (for boys) and adolescent childbearing.
- ☆ Monetary costs are also high. Teen childbearing cost taxpayers $9.1 billion in 2004.

Sexual risk-taking has also resulted in high rates of STD among teens:

- ☆ Young people age 15 to 24 account for one-quarter of the sexually active population in the United States but nearly one-half of all new cases of STDs. Nearly 4 million new cases occur each year among teens. As a result, about one-third of all sexually active young people become infected with an STD by age 24.
- ☆ Rates of some STDs have declined among teens, while others have increased.
- ☆ The prevalence of HIV is low among young adults in general, but the estimated number of HIV/AIDS cases among teens rose between 2001 and 2005. By the end of 2005, 6,324 AIDS cases had been reported among 13- to 19-year-olds.
- ☆ The human costs of some STDs are high, both for individual teens and for society. These diseases can lead to infertility, ectopic pregnancy, cancer, and other health problems

and can cause long-term emotional suffering and stress. Moreover, having an STD can increase the likelihood of contracting HIV.

- ☆ Many STDs are curable, but some, such as herpes simplex virus type 2 and HIV, are not.
- ☆ The monetary cost of STDs among teens is unknown, but direct costs of curable STDs among all sexually active Americans have been estimated at $8.4 billion per year.

## TYPES OF SEXUAL BEHAVIOR THAT AFFECT PREGNANCY AND STD

Most programs that seek to prevent teen pregnancy target behavior in two areas: abstinence, which enables teens to avoid pregnancy, and the correct and consistent use of contraception, which reduces the risk of pregnancy for sexually active teens. For the most part, programs that positively affect these types of behavior help reduce teen pregnancy.

However, preventing STDs requires a more complex approach. In addition to promoting abstinence and condom use, programs to prevent STDs can emphasize reducing the number of sexual partners, avoiding concurrent sexual partners (and people who have concurrent partners), increasing the number of weeks or months between sexual partners, testing for and treatment of STDs, vaccination against HPV (the human papillomavirus) and hepatitis B, and male circumcision.

Whenever appropriate, programs to prevent pregnancy and programs to prevent STDs should focus on preventing both outcomes. After all, concerns about both pregnancy and STD motivate teens to avoid sexual risk.

Communities need to send clear, consistent messages about appropriate sexual behavior. Not every organization in a community needs to advocate every method of reducing the risk of teen pregnancy and STDs, but it is important that organizations avoid sending conflicting messages to young people. Emphasizing different types of behavior, such as abstinence and the use of condoms by teens who do have sex, will not necessarily produce conflicting messages unless organizations denigrate each other's approaches.

## FACTORS INFLUENCING TEEN SEXUAL BEHAVIOR

Nearly all teenagers experience pressure to have sex at some time or other and therefore nearly all teens are at risk of pregnancy and STD. What causes a teen to decide to have sex or to use or not use condoms or other forms of contraception, if they do have sex? Research has identified more than 500 risk and protective factors that influence teens' sexual behavior. Risk factors increase the likelihood of pregnancy or STD; protective factors decrease the likelihood.

Effective programs change teens' sexual behavior by acting on the risk and protective factors that influence such behavior. Positive changes in sexual behavior may, in turn, result in lower rates of teen pregnancy or STD. Therefore, an understanding of risk and protective factors is necessary not only for changing teen sexual behavior, but also for explaining how and why programs are effective. Programs should focus on those risk and protective factors that they can markedly improve and that causally affect sexual risk behavior. The presence (or absence) of risk and protective factors can also help in identifying which teens are most at risk of having sex or having unprotected sex.

Results of some 450 studies demonstrate that risk and protective factors are both very numerous and extremely diverse. They stem from a teen's biological makeup (especially sex, age, and physical maturity), home and community environments (especially the sexual values expressed and modeled by the home and community and the disadvantage or disorganization of the home and community), the teen's friends and peers (especially their sexual values and behavior), the teen's romantic partners, and the teen's own sexual values and attitudes. They also include connection to family, school, and other groups or

institutions that discourage risky sexual behavior, encourage responsible behavior, or both. Thus, many of the factors involve some aspect of sexuality (for example, sexual values and confidence to avoid unprotected sex) and are therefore considered sexual factors. Other important factors do not involve sexuality (for example, plans for the future) and are considered nonsexual. Prevention programs have successfully targeted both types of factors, as well as a combination of the two. Of all the known risk and protective factors, teens' own sexual beliefs, values, attitudes, and intentions are the most strongly related to sexual behavior.

## CRITERIA FOR INCLUDING IMPACT STUDIES IN THIS REVIEW

Conclusions about the effectiveness of various pregnancy and STD/HIV prevention programs are only as reliable as the studies on which they are based. Therefore, to be included in this review, studies of prevention programs had to meet several criteria, among them: having been conducted in the United States; having been completed or published between 1990 and 2007; focusing on teens age 12 to 18; examining impact on sexual behavior, use of condoms or other contraceptives, combined measures of sexual risk, and pregnancy, birth, or STD/HIV rates; having a reasonably strong experimental or quasi-experimental research design and a sample size of at least 100 teens; measuring behavior for a sufficient length of time; and using appropriate statistical analysis.

The strength of the evidence that a program or a group of programs are (or are not) effective is also critical. *Emerging Answers 2007* presents 14 criteria that communities and organizations can use to gauge the quality of research methods and evidence before deciding how much weight to give the results from individual studies or groups of studies.

## FINDINGS ON PROGRAMS

*Emerging Answers 2007* organizes programs to prevent teen pregnancy and STD/HIV into three broad categories: those that focus on sexual risk and protective factors, those that focus on nonsexual factors, and those that focus on both. Successful programs exist in all three categories.

### 1. PROGRAMS THAT FOCUS ON SEXUAL FACTORS

Some programs focus primarily on changing the psychosocial risk and protective factors that involve sexuality: that is, teens' knowledge, beliefs, and attitudes about sex, perceived norms, their confidence in their skills to avoid sex or to use condoms or contraception, and their intentions regarding sexual behavior and the use of contraception. To be effective, such programs must be straightforward and specific; for example, they might discuss realistic situations that could lead to unprotected sex and methods for avoiding those situations, for remaining abstinent, and for using condoms and other contraceptives. Programs that focus on sexual factors are divided into six groups in this review.

#### Curriculum-based sex and STD/HIV education programs

Programs based on a written curriculum and implemented among groups of teens have been widely implemented in schools and elsewhere to prevent teen pregnancy and STD/HIV for many years. In addition, the vast majority of Americans support them—more than 80 percent of U.S. adults believe that comprehensive sex education programs, which emphasize abstinence, but also encourage condom and contraceptive use, should be implemented in schools.

Overall, about two-thirds of the curriculum-based sex and STD/HIV education programs studied have had positive effects on teen sexual behavior. For example, they delayed the initiation of sex, increased condom or contraceptive use, or both. Virtually all of the programs also improved sexual protective factors. The programs had mixed, but encouraging effects on reducing teen pregnancy, childbearing, and STDs.

An in-depth analysis of effective and ineffective programs reveals 17 important characteristics of effective programs (Box 1). These characteristics described the development of the curricula, their content (including behavioral goals, messages about behavior, and teaching strategies), and their implementation. Most programs with these 17 characteristics were effective; most effective programs incorporated most of these characteristics; and programs with these characteristics were more effective than programs without these characteristics.

The more effective curriculum-based sex and STD/HIV education programs reduced one or more measures of sexual risk by roughly a third or more, but they did not eliminate risk. Thus, these programs alone cannot prevent all unintended pregnancy or STD, but many of them can change teens' sexual behavior and help reduce teen pregnancy and STD. They should continue to be an important part of any comprehensive community prevention initiative.

*Abstinence programs*

Although sex education programs fall along a continuum, they can be divided into abstinence programs, which encourage and expect young people to remain abstinent, and comprehensive programs, which encourage abstinence as the safest choice but also encourage young people who are having sex to always use condoms or other measures of contraception.

At present, there does not exist any strong evidence that any abstinence program delays the initiation of sex, hastens the return to abstinence, or reduces the number of sexual partners. In addition, there is strong evidence from multiple randomized trials demonstrating that some abstinence programs chosen for evaluation because they were believed to be promising actually had no impact on teen sexual behavior. That is, they did not delay the initiation of sex, increase the return to abstinence or decrease the number of sexual partners. At the same time, they did not have a negative impact on the use of condoms or other contraceptives.

Two less rigorous studies suggest that abstinence programs may have some positive effects on sexual behavior. One program appeared to delay the initiation of sex among middle school students and to decrease current sexual activity, but these positive results were not replicated in a stronger, more rigorous study. A second program appeared to decrease the frequency of sex and reduce the number of sexual partners.

Many of the abstinence programs improved teens' values about abstinence or their intentions to abstain, but these improvements did not always endure and often did not translate into changes in behavior.

Even though there does not exist strong evidence that any particular abstinence program is effective at delaying sex or reducing sexual behavior, one should not conclude that all abstinence programs are ineffective. After all, programs are diverse, fewer than 10 rigorous studies of these programs have been carried out, and studies of two programs have provided modestly encouraging results.

In sum, studies of abstinence programs have not produced sufficient evidence to justify their widespread dissemination. Instead, efforts should be directed toward carefully developing and evaluating these programs. Only when strong evidence demonstrates that particular programs are effective should they be disseminated more widely.

*Comprehensive programs*

Two-thirds of the 48 comprehensive programs that supported both abstinence and the use of condoms and contraceptives for sexually active teens had positive behavioral effects. Specifically, over 40 percent of the programs delayed the initiation of sex, reduced the number of sexual partners, and increased condom or contraceptive use; almost 30 percent reduced the frequency of sex (including a return to abstinence); and more than 60 percent reduced unprotected sex. Furthermore, nearly 40 percent of the programs had positive effects on more than one of these behaviors. For example, some programs both delayed

the initiation of sex and increased condom or other contraceptive use.

No comprehensive program hastened the initiation of sex or increased the frequency of sex, results that many people fear. Emphasizing both abstinence and protection for those who do have sex is a realistic, effective approach that does not appear to confuse young people.

Comprehensive programs worked for both genders, for all major ethnic groups, for sexually inexperienced and experienced teens, in different settings, and in different communities. Programs may be especially likely to be effective in communities where teen pregnancy or STD and HIV are salient issues and may be less effective where these issues are not. Some programs' positive impact lasted for several years.

Virtually all of the comprehensive programs also had a positive impact on one or more factors affecting behavior. In particular, they improved factors such as knowledge about risks and consequences of pregnancy and STD; values and attitudes about having sex and using condoms or contraception; perception of peer norms about sex and contraception; confidence in the ability to say "no" to unwanted sex, to insist on using condoms or contraception, or to actually use condoms or contraception; intention to avoid sex or use contraception; and communication with parents or other adults about these topics. In part by improving these factors, the programs changed behavior in desired directions.

An important question is whether a program's positive results in one study can be replicated in other communities by other educators and research teams. When three programs were replicated with fidelity in different locations throughout the United States, but in the same type of setting, the original positive effects were confirmed. This is very encouraging and suggests that effective programs can remain effective when they are implemented with fidelity by other people in other communities with similar groups of young people. However, when programs were substantially shortened, when activities related to a particular behavior (e.g., use of condoms) were deleted, or when the programs were implemented in different settings, the original positive results were not replicated.

### Sex and STD/HIV education programs for parents and their teens

Parents and teenagers have remarkably few conversations about sexual matters, often because both parents and teens feel uncomfortable discussing them together. Few parents are willing or able to participate in special programs, but studies consistently indicate that when they do, their communication with their teens and their own comfort with discussing sexual matters is enhanced. These positive effects seem to dissipate with time and under some conditions, but not all conditions may affect teen sexual behavior.

Studies of seven programs for parents of teens indicate that these programs sometimes reduce teens' sexual risk-taking, particularly if the programs include components for teens that incorporate many of the 17 characteristics of effective curriculum-based programs for teens. Programs to increase parental involvement and monitoring may also have a positive impact, but the evidence is still weak.

### Stand-alone video- and computer-based instruction

Most young people, even those in disadvantaged circumstances, are comfortable with computers and interactive technology, and studies have shown that interactive programs can improve knowledge and attitudes about sexuality. This technology has several benefits: it is relatively inexpensive, it can be used in most locations, and it allows programs to be replicated more easily and with greater fidelity. A possible drawback to stand-alone instruction is the lack of group interaction.

Does video- and computer-based instruction change teens' sexual behavior? No definite conclusions can be reached yet, but three studies suggest that short, noninteractive videos alone may not have any effect on behavior, and that long, interactive videos that are viewed several

times may have an impact on some behavior, possibly for as long as six months.

### Clinic-based programs

Reproductive health clinics are a tried-and-true way of providing teens with reproductive health care and improving their knowledge of, access to, and skill at using condoms or other contraceptives. Many family planning clinics have special programs for teens. In addition to providing contraception, the vast majority of publicly funded clinics encourage abstinence for teens, and encourage teens to discuss sexual issues with their parents.

Large numbers of young people obtain contraceptives from publicly funded clinics each year, and presumably those contraceptives prevent many pregnancies. Large studies in California demonstrated that when access to confidential low-cost family planning services was greatly expanded, the number of teens obtaining contraception from these publicly funded clinics greatly increased. Nationally, while greater use of contraception from publicly funded clinics undoubtedly reduced teen pregnancies, it is difficult to estimate the magnitude of this impact, because the long-term impact of these family planning services on teen sexual behavior and on use of contraception from other sources is not known. Therefore, the magnitude of the effect of publicly funded clinics on teen pregnancy is difficult to estimate.

In contrast to studies that attempted to measure the impact of improving access to family planning services in general, six studies used experimental or quasi-experimental designs to measure impact on clinic protocols within the clinic. These studies demonstrated that when clinics provided one-on-one counseling and information about abstinence and contraception, presented a clear message about sexual behavior, and provided condoms or other contraceptives, they typically did not increase sexual activity but did consistently increase the use of protection by teens who were sexually active.

When clinics in four studies provided emergency contraception to sexually experienced adolescents in advance of unprotected sex, those young people were more likely to use emergency contraception than their counterparts who did not have such contraception readily available. Advance provision of emergency contraception did not increase sexual activity. However, it did not significantly reduce teen pregnancy rates either, in part because sample sizes were too small and teens used emergency contraception too few times.

### School-based and school-linked clinics and school condom-availability programs

Clinics located in or near schools are ideally situated to provide reproductive health services to students—they are conveniently located, confidential, and free; their staff are selected and trained to work with adolescents; and they can integrate education, counseling, and medical services. Some school clinics dispense or provide prescriptions for contraceptives, and substantial proportions of sexually experienced students obtain contraceptives from them.

According to a small number of studies of mixed quality, providing contraceptives in school-based clinics does not hasten the onset of sexual intercourse or increase its frequency. But in most schools, unless clinics focus on pregnancy or STD/HIV prevention in addition to providing contraceptives, they do not increase the overall use of contraceptives markedly or decrease the overall rates of pregnancy or childbirth. When the clinics did focus on pregnancy prevention, gave a clear message about reducing sexual risk and avoiding pregnancy, and did make contraception available, they may have increased contraceptive use, but the evidence is not strong.

More than 300 schools without clinics make condoms available to students through counselors, nurses, teachers, vending machines, or baskets. In general, large proportions of sexually experienced students obtain condoms from school programs, particularly when multiple brands of condoms are freely available in convenient, private locations. Students also obtain condoms from school

clinics. According to a small number of studies of mixed quality, making condoms available in schools does not hasten the onset of sexual intercourse or increase its frequency. Its impact on actual use of condoms is less clear.

### Community-wide pregnancy or STD/HIV prevention initiatives with multiple components

Many communities have realized that lowering teen pregnancy or STD rates requires more than isolated programs aimed at discrete groups of teens. These communities have developed a variety of broad-based collaborations or initiatives. Four of six studies of these programs found that the programs delayed first sex, increased the use of contraceptives, lowered rates of pregnancy and childbirth, or produce some combination of these effects. The findings are particularly impressive because most of the studies measured impact on community-wide outcomes, not individual outcomes measured only among those most directly involved. In addition, initiatives that focus on pregnancy or STD/HIV prevention, even those that focus primarily on condom or contraceptive use, do not hasten or increase sexual activity.

By far the most intensive community-wide program, implemented in Denmark, South Carolina, may also have been the most effective in terms of reducing pregnancy. It included extensive sex education in the classroom, individual meetings with nearly every Medicaid-eligible student (86 percent of the student body) twice a month to talk about reproductive health, and community events. Over many years the pregnancy rate in that area declined more rapidly than the rates in similar areas. However, when other communities attempted to replicate this program, but did so poorly, they did not achieve consistent positive effects.

## 2. PROGRAMS THAT FOCUS ON NONSEXUAL FACTORS

Many nonsexual risk and protective factors affect adolescents' sexual behavior. For teenage girls, protective factors such as good performance in school, positive plans for the future, and strong connections to family, school, and faith community all reduce pregnancy and birth rates. In addition, many types of risky behavior are related to each other. Consequently, some professionals working with young people have advocated approaches that focus on the whole individual rather than separate programs that focus on specific types of behavior and they believe that two of the most promising approaches to reducing teen pregnancy are to improve educational and career opportunities through youth development programs and to increase the connection between young people and responsible adults and institutions such as the family, schools, and community organizations. Professionals have also considered whether welfare reform might generate new community norms about work and childbearing and also cause more low-income parents to work and thereby curtail adolescent childbearing. Programs that focus on nonsexual risk and protective factors are divided into three groups.

### Welfare reform for adults

At least 16 studies have examined whether changes in the welfare requirements for adults would have an impact on birth rates among teenage girls whose parents were on welfare. They most commonly studied three changes: the requirement that parents work or participate in activities that would make them more employable, supplements to the income of employed parents, and limitations on the amount of time families could receive cash assistance. None of these changes affected adolescent childbearing. One should not conclude that welfare policies and programs that affect adolescents directly have no impact on childbearing, for such policies and programs were not evaluated.

### Early childhood development programs

Programs designed to enhance the development of young children may be beneficial for many reasons, but do those benefits extend to sexual behavior in adolescence, specifically to reducing teen childbearing? Only two very small studies have tried to answer that question, so conclusions are tenta-

tive at best. Nevertheless, results are encouraging. Teens who had been in a year-round preschool program or in a three-year elementary school program designed to involve their parents delayed childbearing by more than a year, scored higher on a number of intellectual and academic measures, and obtained more years of education than those who had not been in the program. The program's impact on educational attainment may partially explain why participants delayed childbearing.

### Youth development programs for adolescents

Two common types of youth development programs for adolescents are service learning and vocational education. By definition, service learning programs have two components: voluntary or unpaid service in the community (e.g., tutoring, working in nursing homes, or helping fix up parks and recreation areas), and structured time for preparation and reflection before, during, and after service (e.g., group discussions, journal writing, or papers). Sometimes the service is voluntary, and sometimes it is part of a class. Often, the service is linked to academic instruction in the classroom.

Studies have produced quite strong evidence that some service learning programs have a positive impact on teens. One study found that service learning delayed the initiation of sex among middle school students, and three studies that evaluated programs in multiple locations found that service learning reduced pregnancy rates during the academic year in which the teens were involved. The programs differed considerably, indicating that the content of the curriculum may not be particularly important, but all of the programs were very intensive and involved students for many hours (e.g. 40 to 80 hours) after school. It is not yet known why these programs are effective.

Vocational education and employment programs typically include academic instruction (or an educational requirement) and either vocational education or actual jobs. Three studies evaluated such programs, all in more than one site. These programs did not significantly reduce teen pregnancy or birth rates in the long run.

Other youth development programs, such as those designed to improve the quality of teaching in elementary school and student attachment to school, very comprehensive and intensive youth development programs, and programs for divorced parents and their adolescent children have produced consistently encouraging results, but too few studies and too many important study limitations preclude one from reaching any definitive conclusions.

## 3. Programs that focus on both sexual and nonsexual factors

A third group of programs focuses on both sexual and nonsexual factors affecting teen sexual behavior. This review divides them into two categories.

### Programs that focus on substance abuse, violence, and sexual risk-taking

Some programs that focus on both sexual and nonsexual risk and protective factors try to change other types of risky behavior, such as alcohol use, drug use, and violence, in addition to sexual risk-taking. Typically, such programs attempt to instill a wide range of positive values in young people in the hope that those values will discourage them from engaging in antisocial or risky behavior. By and large, such programs were not effective, although two of them, *Aban Aya Youth Project* and *Project AIM*, did have long-term positive effects on recent sexual activity and condom use by teenage boys. Further research is needed to determine why some programs were effective and others were not.

### Programs that focus on sexual risk-taking, with sexuality and youth development components

This category actually includes quite diverse programs. They are discussed separately.

Two programs were intensive abstinence-until-marriage programs with strong curriculum and youth development components. They were found to have no significant effect on initiation of

sex, sex in the last 12 months, number of sexual partners, unprotected sex, pregnancy rates, birth rates, or STD rates.

One study evaluated several client-centered programs that provided small-group and individualized services and were designed to improve teens' information about sex, strengthen their coping skills, and provide emotional support and positive guidance from trusted adults. It found that these programs did not appear to delay sex or increase contraceptive use, but they did reduce the frequency of sex.

Programs for the sisters of pregnant teenagers are designed to help girls stay in or return to school, improve their self-esteem, give them the knowledge and skills they need to make decisions about their health, improve their access to health and reproductive health services, and increase their communication with parents and other adults. One study indicated that the programs delayed sex and decreased reported pregnancy rates, but did not significantly reduce frequency of sex or number of partners, nor did they increase the use of contraceptives.

Perhaps the most intensive program, conducted over the longest time was the *Children's Aid Society-Carrera Program (CAS-Carrera Program)*. This program recruited teens when they were about 13 to15 years old and encouraged them to participate throughout high school. The *CAS-Carrera Program* operated five days a week and provided services in a wide range of areas: family life and sex education; general education, including individual academic assessment, tutoring, preparation for standardized exams, and assistance with college entrance; employment, including a job club, stipends, individual bank accounts, jobs, and career awareness; self-expression through the arts; individual sports; and comprehensive medical care, including mental health care, reproductive health services, and contraception when needed. In all of these areas, staff tried to create close, caring relationships with participants. They also sent a very clear message about avoiding unprotected sex and pregnancy. Although the program focused on teens, it also provided services for the participants' parents and other adults in the community. Teens spent an average of 16 hours per month in the program during the first three years.

A rigorous study found that the program was effective for girls, but not boys. Among girls in six sites in New York City, it delayed first sex, increased the use of condoms along with another effective method of contraception, and reduced pregnancy rates—for three years. However, in six other sites outside of New York City, not all of these favorable results for girls were obtained. Moreover, when communities in another state attempted to implement the program without the benefit of training or program materials, the program did not curtail sexual risk-taking.

## WHAT DO THE FINDINGS MEAN FOR COMMUNITIES?

Clearly, a wide variety of programs can be effective, especially if they target sexual risk and protective factors and behavior, but even if they do not. To reduce teen pregnancy and STDs dramatically, communities may need programs that focus on the *sexual* risk and protective factors, for these are the most highly related to sexual risk behavior, and also programs that address *non-sexual* factors that are also related to sexual risk behavior. This is good news because it increases the options available to organizations that want to reduce teen pregnancy and STDs.

But how should organizations go about choosing a program? Should they replicate an existing program, adapt a program, or design a new one?

The first step is to take stock of what teens need and what resources the community already offers. For instance, how many teens are having sex? How many of them use condoms or other contraceptives? How many become pregnant or infected with an STD and at what age? Are STDs a greater or lesser problem than pregnancy? Which STDs are most prevalent? What are the characteristics of the sexual networks through which they are transmitted? How good

are existing sex and STD/HIV education programs? Are condoms and other contraceptives and reproductive health services readily available to teens? What are the barriers teens face in remaining abstinent or using condoms or other forms of contraception? What are the other risk and protective factors that most strongly affect their sexual behavior? How stable and close-knit are families? What youth development programs are available to teens? What are the resources—staff, organizational, and monetary—available to implement different kinds of new programs?

After taking stock, organizations should adopt one of the following strategies:

1. When possible, implement with fidelity programs found to be effective for similar populations of teens
2. If careful replication is not possible, select or design programs that incorporate the key characteristics of effective programs (see Box 1)
3. If neither of these strategies is possible or appropriate, develop a new program using the process typically completed by designers of effective sex and STD/HIV education programs (see Box 1).

If an organization implements with fidelity a program that reduced sexual risk in a similar group of teens in a similar setting, chances are good that the results will be similar. If several studies found the program to be effective when replicated in different communities by different groups, the chances of success are even greater.

Fifteen very different programs in different settings have strong evidence of positive impact on behavior (Box 2). Organizations and communities should seriously consider these programs.

Organizations and communities may also want to adapt these programs or even explore others as well, including promising programs that need further study. After all, no existing program matches the needs of every group, is suited to the values or resources of every community, or, for that matter, eliminates sexual risk-taking and pregnancy among teens. To be effective, programs must address the particular needs of the participating teens (e.g., their incorrect beliefs, their negative attitudes or their lack of skills). New guidelines and materials for adapting programs without diminishing their effectiveness will soon be available through the Department of Reproductive Health at CDC. Developing a new program poses a much greater challenge than replicating or adapting an existing one, but it gives program designers far more flexibility. When organizations develop new programs, they should consider completing the activities commonly used to develop effective programs and they should strive to develop programs incorporating as many of the characteristics and components of effective programs as possible.

For decades, dedicated adults have worked with teens to prevent unintended pregnancy. Their efforts have been rewarded with declining rates of pregnancy and childbirth. Prevention efforts have also resulted in lower rates of some STDs. An increasingly robust body of research is clarifying the types of behavior that most strongly affect pregnancy and STD/HIV transmission, is identifying the factors that influence sexual risk-taking and is revealing the effects of programs on teen sexual behavior and rates of pregnancy and STD. Yet pregnancy and STD rates are still high, and both more research and more effective programs are needed.

The challenge now is to continue building on these successes. Communities need to integrate what is learned from experience with what is learned from research and then use that knowledge to guide the development of more effective programs for teens. Such programs will help young people avoid pregnancy and STDs, make a more successful transition to adulthood, and prepare to be the parents of the next generation.

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## Box 1: Characteristics of Effective Curriculum-Based Programs

| THE PROCESS OF DEVELOPING THE CURRICULUM | THE CONTENTS OF THE CURRICULUM ITSELF | THE PROCESS OF IMPLEMENTING THE CURRICULUM |
|---|---|---|
| 1. Involved multiple people with expertise in theory, research, and sex and STD/HIV education to develop the curriculum | **CURRICULUM GOALS AND OBJECTIVES** | 14. Secured at least minimal support from appropriate authorities, such as departments of health, school districts, or community organizations |
| 2. Assessed relevant needs and assets of the target group | 6. Focused on clear health goals—the prevention of STD/HIV, pregnancy, or both | 15. Selected educators with desired characteristics (whenever possible), trained them, and provided monitoring, supervision, and support |
| 3. Used a logic model approach that specified the health goals, the types of behavior affecting those goals, the risk and protective factors affecting those types of behavior, and activities to change those risk and protective factors | 7. Focused narrowly on specific types of behavior leading to these health goals (e.g., abstaining from sex or using condoms or other contraceptives), gave clear messages about these types of behavior, and addressed situations that might lead to them and how to avoid them | 16. If needed, implemented activities to recruit and retain teens and overcome barriers to their involvement (e.g., publicized the program, offered food or obtained consent) |
| 4. Designed activities consistent with community values and available resources (e.g., staff time, staff skills, facility space and supplies) | 8. Addressed sexual psychosocial risk and protective factors that affect sexual behavior (e.g., knowledge, perceived risks, values, attitudes, perceived norms, and self-efficacy) and changed them | 17. Implemented virtually all activities with reasonable fidelity |
| 5. Pilot-tested the program | **ACTIVITIES AND TEACHING METHODOLOGIES** | |
| | 9. Created a safe social environment for young people to participate | |
| | 10. Included multiple activities to change each of the targeted risk and protective factors | |
| | 11. Employed instructionally sound teaching methods that actively involved participants, that helped them personalize the information, and that were designed to change the targeted risk and protective factors | |
| | 12. Employed activities, instructional methods, and behavioral messages that were appropriate to the teens' culture, developmental age, and sexual experience | |
| | 13. Covered topics in a logical sequence | |

## Box 2: Programs with Strong Evidence of Positive Impact on Sexual Behavior or Pregnancy or STD Rates

### Curriculum-Based Sex and STD/HIV Education Programs

1. Becoming a Responsible Teen: An HIV Risk Reduction Program for Adolescents [1]
2. ¡Cuídate! (Take Care of Yourself ) The Latino Youth Health Promotion Program [2]
3. Draw the Line, Respect the Line [3-5] (Implemented with both genders; found effective for boys only)
4. Making Proud Choices: A Safer Sex Approach to HIV/STDs and Teen Pregnancy Prevention [6]
5. Reducing the Risk: Building Skills to Prevent Pregnancy, STD & HIV [7]
6. Safer Choices: Preventing HIV, Other STD and Pregnancy [8-11]
7. SiHLE: Sistas, Informing, Healing, Living, Empowering [12] (Implemented and effective for girls only)

### Mother-Adolescent Programs

8. Keepin' It R.E.A.L.![13]

### Clinic Protocols and One-on-One Programs

9. Advance provision of emergency contraception (Implemented and effective for girls only)3
10. Reproductive Health Counseling for Young Men [14]

### Community Programs with Multiple Components

11. HIV Prevention for Adolescents in Low-Income Housing Developments [15]

### Service Learning

12. Reach for Health Community Youth Service Learning [16]
13. Teen Outreach Program (Implemented with both genders; evaluated and found effective for girls only)[17]

### Multi-Component Programs with Intensive Sexuality and Youth Development Components

14. Aban Aya [18](Implemented with both genders; found effective for boys only)
15. Children's Aid Society Carrera Program [19] (Implemented with both genders; found effective for girls only)

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1. A similar program for fathers and their sons is called *REAL Men*. An evaluation of it provided evidence of impact on delay in sex and greater condom use, but it is not included in this list because only seven Boys and Girls Clubs were randomly assigned to intervention groups.

2. All of the service learning programs that have been evaluated, including *Reach for Health Community Youth Service, Teen Outreach Program*, and *Learn and Serve*, have found results suggesting a positive impact upon either sexual behavior or pregnancy. According to the evaluation of *TOP*, the particular curriculum used in the small-group component did not appear to be critical to the success of service learning. Evaluation of the Learn and Serve programs did not meet the criteria for inclusion here because it did not use an experimental design, but it did confirm the impact of service learning on pregnancy, especially among middle school youth.

3. This program has provided the strongest evidence of reducing pregnancy for three years as reported by girls. However, when not implemented in New York City it was less effective, and when not implemented with the benefit of *CAS-Carrera* training, materials, and oversight in one study, it was not effective.

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## REGARDING PREGNANCY

- ☆ Teen pregnancy and birth rates have declined by about one-third since the early 1990s.
- ☆ These declines are being driven by decreased sexual intercourse and increased use of contraceptives.
- ☆ Despite the declines, teen pregnancy and birth rates in the United States remain far higher than those in other fully industrialized countries.
- ☆ Teen mothers are less likely to complete high school, less likely to attend college, and more likely to be single parents than women who delay childbearing just a few years.
- ☆ Children of teen mothers often suffer the most serious consequences of teen childbearing—they tend to grow up in less supportive and stimulating home environments, have lower cognitive development, worse educational outcomes, higher rates of behavior problems, higher rates of incarceration (sons) and higher rates of adolescent childbearing themselves than children born to older mothers.
- ☆ Teen childbearing cost taxpayers $9.1 billion in 2004.

## REGARDING STD

- ☆ Young people (age 15 to 24) represent 25 percent of the sexually active population but account for about half of all news cases of STD.
- ☆ About one-third of all sexually active young people become infected with an STD by age 24.
- ☆ Teens still have some of the highest rates of STD infection (e.g., teen girls have the highest age-specific rates of gonorrhea and chlamydia).
- ☆ Among teens, rates of some STDs have declined, while rates of others have increased.
- ☆ HIV prevalence among young adults in general is quite low. However, it is much higher in some parts of the country and among some subgroups.
- ☆ The human and monetary costs of STD are very high. STDs other than HIV can lead to infertility, ectopic pregnancy, cancer, and other health problems, as well as cause long-term emotional suffering and stress.

# Sexual Risk-Taking and Its Consequences: The Case for Prevention

Sexual intercourse and pregnancy during the teen years are not new. However, several changes over the past hundred years have had a profound impact on the prevalence, nature, and outcomes of adolescent sexual activity in the United States. Puberty (menarche and spermarche) now occurs years earlier, on average, and young people marry years later. In addition, access to contraception has greatly increased, and society's values about sex before marriage—even pregnancy and childbearing before marriage—have changed considerably. For these and other reasons, many young people began having sexual intercourse at increasingly younger ages during the 1960s, 1970s, and 1980s. Consequently, the widening gap between the ages of puberty and the initiation of intercourse, on the one hand, and the age of marriage, on the other, led to a larger proportion of sexually experienced young people, a greater number of sexual partners before marriage, and higher rates of unintended pregnancy, births outside of marriage, and sexually transmitted diseases (STDs), including HIV (the AIDS virus).

During the 1990s and early 2000s, slightly smaller percentages of adolescents had sex, and increasing percentages used condoms or other forms of contraception, causing teen pregnancy and birth rates to decline substantially. Although these declines were most welcome, teen pregnancy and birth rates still remained very high, both in terms of their costs to individuals and to society and in comparison with teen pregnancy and birth rates in other developed countries. Rates of some STDs increased among teens during this period, while rates of other STDs decreased.

Some of these trends among adolescents paralleled trends among adults. During the last few decades, the proportion of adults who reported having had sex before marriage has increased to 95 percent, and the proportion of adults who reported having had sex five or more years before marriage has increased steadily. The birth rate among unmarried, adult women has also risen steadily over the last several decades [1]. Notably, while the birth rate among teens has declined, birth rates among women in their twenties and beyond have remained relatively stable or increased [2].

This chapter describes in detail changes in teen sexual activity (sexual intercourse), use of contraceptives, pregnancies and births, and STDs, including HIV. The chapter also touches on the consequences of adolescent childbearing and STD. Finally, it highlights the implications of these changes for pregnancy and STD/HIV prevention programs.

## ADOLESCENT SEXUAL ACTIVITY

The median age of menarche for U.S. girls is 12.6 years, and their median age of marriage is 25.3 years [3; 4]. The median age of spermarche for boys is 14.0 years, and their median age of marriage is 27.1 years [3; 4]. This gap of more than 12 years between the time adolescents become fertile and their sexual feelings intensify and the time they marry results in a

long period during which they need to avoid unintended pregnancy and STDs.

About half of all teens report having had sexual intercourse at some time [5], and the proportion increases steadily with age. In 2002, 16 percent of boys and 14 percent of girls had had sex by age 15; by age 19, 70 percent of boys and 75 percent of girls had [6]. Among students in grades 9 through 12 in 2005, 47 percent reported ever having had sexual intercourse, ranging from 34 percent of ninth graders to 63 percent of twelfth graders [7].

Rates of sexual activity also vary with race and ethnicity, although much of this variation disappears when studies take into account poverty and other forms of disadvantage. In 2005, 68 percent of African-American, 51 percent of Hispanic, and 43 percent of white high school students had ever had sex [7].

The percentage of teenagers who had ever had sex by any given age increased substantially during the 1970s and 1980s but leveled off or even dropped during the 1990s. According to data on 15- to 19-year-old girls from the National Survey of Family Growth, the proportion who had had sex rose from 29 percent in 1970 to 53 percent in 1988, remained stable at 52 percent in 1995, and declined to 47 percent in 2002 [6; 8; 9]. That same study showed a steady decline in the proportion of boys who had ever had sex, from 60 percent in 1988 to 55 percent in 1995 and 46 percent in 2002 [6; 10]. More recent data, collected from national samples of high school students, are available from the Youth Risk Behavior Survey. According to these data, the percentage of girls who had ever had sex held steady at about 50 percent from 1991 to 1995 and then decreased to 46 percent in 2005, while the percentage of boys dropped from 57 percent in 1991 to 48 percent in 2005 [11]. Regardless of the source, data show that the proportion of teens who have ever had sex is decreasing, particularly among boys.

When teens who had never had sex were asked to choose their main reason for abstaining, most cited their religious or moral values. Other common reasons were wanting to avoid pregnancy and not having met the right partner [5].

Many very young girls who have had sex report that it was involuntary or unwanted (that is, they did not want it to happen when it did). A study in 2002 of girls who were age 14 or younger when they first had sex found that 18 percent characterized their first sexual experience as involuntary, and 27 percent indicated it was unwanted [5].

Teens who have sex tend to do so sporadically. In a study of all sexually experienced girls, only 43 percent reported having had sex at all during the 12 months prior to the interview, and only 36 percent reported having had sex during the previous three months [5]. In 2005, 47 percent of high school students had ever had sex, but only 34 percent had had sex during the previous three months [7]. Because of the sporadic nature of teen sexual activity, adolescents often do not plan to have sex on a particular occasion, but sometimes do so anyway.

Most sexually experienced teenagers do not have more than one partner during any given period—that is, they practice premarital serial monogamy [12]. Furthermore, in 2002, about 70 percent of sexually experienced teen girls and 60 percent of sexually experienced teen boys had had either no or one sexual partner in the past year. However, 16 percent of sexually experienced teens had had two or more partners in the past year and were therefore at greater risk of pregnancy and especially of STD [5]. In part because sexually active teens generally accumulate more partners over time, teens who initiate intercourse at younger ages have a greater number of sexual partners.

African-American and Hispanic teens have more sexual partners than white teens by any given age, in part because they initiate intercourse earlier. In 2005, 14 percent of all high school students had had sexual intercourse with four or more sexual partners. When broken down into racial/ethnic groups, however, the data show that 28 percent of non-Hispanic black, 16 percent of Hispanic, and 11 percent of non-Hispanic white students had had four or more partners [7].

While most sexually active teens have sexual partners close to their own ages, some have partners that are much older. Among sexually experienced teen girls, 22 percent had their first sexual experience with a male partner four or more years older, and only 19 percent first had sex with a partner who was the same age or younger [5]. When teen girls have sex at a young age with much older partners, the chances are greater that their first sexual experiences are involuntary or unwanted and that they will become pregnant [13].

## USE OF CONTRACEPTION

Most sexually experienced teenagers report that they use contraception, at least some of the time. About 74 percent of girls used contraception the first time they had sex, and 83 percent reported having used contraception the most recent time they had sex [14]. Among boys, approximately 82 percent used some form of contraception the first time they had sex, and 90 percent reported having used contraception the last time they had sex [14].

The apparent trends over time in contraceptive use among teens depend upon the measure of contraceptive use, the exact time period, and the data sets. Data from the National Survey of Family Growth point to a large increase in contraceptive use by teen girls having sex for the first time, from 48 percent in 1982 to 74 percent in 2002 [14; 15]. Among sexually active girls, the proportion who had used contraception at the most recent sexual intercourse dropped between 1988 and 1995 but rose from 1995 to 2002 [5]. Use of contraceptives in the past month by sexually active girls held constant at 77 percent between 1988 and 1995 but decreased slightly in 2002, to 73 percent [16].

Non-Hispanic white girls are more likely than African-American or Hispanic girls to have used contraception the last time they had sex. According to the 2002 National Survey of Family Growth, 89 percent of white girls, 74 percent of African-American girls, and 63 percent of Hispanic girls used one or more methods of contraception when they last had sexual intercourse [14]. In all three groups, the proportion of girls who used a contraceptive method the last time they had sex increased between 1995 and 2002. In 2005, 69 percent of African-American, 63 percent of white, and 58 percent of Hispanic sexually active high school students used a condom when they last had sex [7].

Condoms and oral contraceptives are the two most commonly used methods of contraception. Between the mid-1980s and the late 1990s, the use of condoms increased (in part because of the HIV epidemic), while the use of oral contraceptives declined [17]. A small but increasing percentage of teens uses hormonal contraceptives such as Depo-Provera. These long-acting methods were not available until the 1990s, but by 2002 they accounted for 10 percent of contraceptives used most recently by teens; furthermore, 21 percent of teens reported that they had used an injectable hormonal method of contraception at some time [5].

Condoms are the most commonly used method of contraception when a teen first has sex. In 2002, 66 percent of sexually experienced girls and 71 percent of sexually experienced boys reported using a condom the first time they had sex [14]. More than nine in ten sexually experienced girls reported that they had ever used a condom [14].

The use of condoms declines with age and sexual experience. In 2002, condom use during most recent sex fell from 83 percent among sexually active15- to 17-year-old boys to 64 percent among sexually active18- to 19-year-old boys [14]. Similarly, 58 percent of sexually active girls age 15 to 17 used a condom the last time they had sex, compared to only 49 percent of girls age 18 to 19 [14]. Data from the 2005 Youth Risk Behavior Survey reveal similar trends as teens grow older [7]. Condoms are used disproportionately often with casual partners and much less often with close romantic partners [18]. Furthermore, the longer a sexual relationship between two people lasts, the less likely they are to use condoms [19].

Many teenagers do not use contraceptives carefully and consistently, thereby exposing themselves to the risk of pregnancy or STDs. Among 15- to 19-year-old girls relying primarily upon oral contraceptives, only 70 percent took a pill every day [20]. Among never-married girls who had had sex in the past year, only 28 percent used a condom every time they had sex. Similarly, only 48 percent of never-married boys used a condom every time they had sex in the past year [5].

When asked why they did not use contraception, adolescents frequently responded that they did not expect or plan to have sex and therefore were not prepared [21-23]. A far less common reason was that they could not afford birth control, did not know where to get it, could not get it, or did not know how to use it. Among teens who reported that they had stopped using contraception, 53 percent said it was because of side effects, while only 7 percent said contraception was too hard to obtain and 2 percent indicated that contraception was too expensive [14].

## PREGNANCIES AND BIRTHS

Despite recent declines, the pregnancy rate among U.S. teens remains very high. In 2002, about 75 of every 1,000 girls age 15 to 19 became pregnant [24]. The rate was higher for 18- to 19-year-olds (126 per 1,000) than for 15- to 17-year-olds (42 per 1,000). Put another way, more than 745,000 girls between the ages of 15 and 19 become pregnant each year. In addition, some 17,300 girls age 14 or younger become pregnant annually, for a grand total of about 764,000 pregnancies per year to girls under age 20 [24].

Other Western industrialized countries with available data in the mid-1990s have much lower rates of teen pregnancy. Canada's 52 pregnancies per 1,000 girls in the mid-1990s and England and Wales' 55 were much lower than the U.S. rate of 75 per 1,000 in 2002. The U.S. rate was three to four times as high as rates in France (23) and Germany (19) and approximately five times the rates in Italy, Spain, and the Netherlands, all of which had 14 pregnancies per 1,000 girls in the mid-1990s [25].

The teen pregnancy rate in 2002 was the lowest it has been in the United States since 1972, when it was first measured [17; 24]. However, it fluctuated considerably during those three decades. In 1972, the teen pregnancy rate was 95 per 1,000. It rose gradually to 111 in 1980, fell slightly to 107 in 1987, spiked rapidly to 117 in 1990, and then declined steadily to 75 per 1,000 in 2002 [24].

The U.S. trends roughly parallel trends in some other western countries (e.g., England and Wales) over the last three decades [25]. Furthermore, the decline in the U.S. teen pregnancy rate since 1990 has roughly paralleled declines in pregnancy rates in numerous other Western countries, suggesting that similar forces may be at work in numerous countries.

The increases in pregnancy rates during the 1970s and 1980s reflected the increases in the proportion of 15- to 19-year-old girls who engaged in sexual intercourse. However, the pregnancy rates among sexually experienced girls in that age group decreased from 254 per 1,000 in 1972 to 162 per 1,000 in 2002 [12; 24]. This decrease reflects, in large part, greater use of more effective contraception among sexually experienced teens [26; 27].

The overall decline in teen pregnancy in the 1990s reflects both a decrease in sexual activity among teens and an improvement in contraceptive use among sexually experienced teens. However, estimates of the relative contribution of greater abstinence and better contraceptive use vary with the time periods studied, the data sources examined, and the statistical methods used. Careful analyses generally suggest that about 15 percent to 50 percent of the decrease is due to fewer girls having sex, and 50 percent to 85 percent is due to better contraceptive use [9; 17; 26; 28].

Although roughly 8 percent of girls between the ages of 15 and 19 become pregnant each year, the cumulative proportion increases each year.

Thus, more than 30 percent of girls in the United States become pregnant before they reach age 20, and many become pregnant a second time before their twentieth birthday [29].

The pregnancy rate among non-Hispanic white girls age 15 to 19 was 48 per 1,000 in 2002. The rate among African-American girls was 134 per 1,000, and the rate among Hispanic girls was 132 per 1,000 [24]. Much of the variation in teen pregnancy rates reflects the disproportionate effects of poverty and other forms of disadvantage in these racial/ethnic groups.

Not all teenage girls who become pregnant have teenage sexual partners. In 1994, 51 percent of pregnant teens' sexual partners were within two years of their age, 29 percent were three to five years older, and 19 percent were six or more years older [27]. Similarly, while the pregnancy rate among 15- to 19-year-old girls was 110 per 1,000 in 1994, only 52 per 1,000 boys in that age range caused a pregnancy [30]. The difference in pregnancy rates was large both for 15- to 17-year-olds (86 per 1,000 girls versus 29 per 1,000 boys) and for 18- to 19-year-olds (146 per 1,000 girls versus 87 per 1,000 boys).

About 82 percent of teen pregnancies in 2001 were unintended [31]. Of all teen pregnancies in that year, about 29 percent were terminated by abortion, 41 percent resulted in unintended births, 16 percent resulted in intended births, and 14 percent ended in miscarriage [31; 32]. The percentage of pregnancies resulting in births fell during most of the 1970s, remained stable during most of the 1980s, and increased somewhat during the late 1980s and 1990s [31; 33]. Consistent with these trends, the proportion of teen pregnancies that ended in abortion also decreased between 1986 and 2001 [24].

The birth rate among U.S. teens is also very high. In 2005, 40 girls per 1,000 between the ages of 15 and 19 gave birth [2]. The rate was higher for 18- to 19-year-old girls (70 per 1,000) than for 15- to 17-year-old girls (21 per 1,000).

The U.S. teen birth rate is also much higher than those in other Western industrialized countries. The U.S. birth rate of 41 per 1,000 in 2004 was much higher than Canada's 14 (in 2003), England and Wales' 27 (the highest rate in Western Europe), Japan's 6 , and the Netherlands' 5 (the lowest rate in Western Europe) [2; 34].

Consistent with the variation in U.S. teen pregnancy rates by race and ethnicity, the birth rates vary widely. In 2005, non-Hispanic whites had 26 births per 1,000 girls, African-Americans had 62 births per 1,000 girls, and Hispanics had 82 births per 1,000 girls [2].

The overall teen birth rate in 2005 was at an all-time low [2]. However, this obscures some important trends. Birth rates dropped off dramatically between the mid-1950s and 1976, slipped ever so slightly until 1987, and then increased rapidly until 1991, when they dropped again. Recent declines in birth rates occurred initially in second births to teens and then in first births as well. Birth rates also fell among girls in all three major racial/ethnic groups. The declines between 1991 and 2005 were greatest among African-Americans (a 46 percent drop), second greatest among non-Hispanic whites (a 40 percent decline) and least among Hispanics (a 22 percent decline) [2].

Among *unmarried* adolescents between age 15 and 19, the birth rate rose from 22 per 1,000 in 1970 to a high of 46 per 1,000 in 1994; the rate fell to 35 per 1,000 in 2004 [2]. Similarly, the percentage of births to unmarried girls under age 20 has risen dramatically, from 15 percent in 1960 to 83 percent in 2005 [1; 35]. This huge increase in nonmarital childbearing alarmed many people and spurred many efforts to reduce unintended pregnancy among teens.

The rise in nonmarital births reflects, in large part, the higher pregnancy rates among unmarried teens. It also reflects the substantial decline in marriage among pregnant teenage girls. In the early 1960s, 59 percent of teens who were unmarried when they conceived were married by the time their baby was born. By the early 1990s,

however, only 16 percent of teens who were unmarried at the time of conception were married by the time of the birth [36].

Although 83 percent of teen births are to unmarried girls, only 23 percent of all nonmarital births are to teenagers [1]. In fact, that percentage has actually declined over time, reflecting the fact that older women are giving birth to more babies outside of marriage than teenagers are. At the same time, it is also true that half of all first nonmarital births are to teens. Thus, the pattern of giving birth outside of marriage often begins during the teen years [37].

As is the case with pregnancies, births among teenage girls are disproportionately the result of sex with somewhat older partners. Indeed, in 1988, 19 percent of the children born to 15- to 19-year-old girls were fathered by men who were six or more years older than their teenage partners [12]. Half of the babies born to girls age 15 to 17 were fathered by partners age 20 or older [38]. On the other hand, of all fathers between the ages of 22 and 29, only 2 percent had had children with girls age 15 to 17 [39]. Because not all 22- to 29-year-old men are fathers, the percentage of them who have had children with very young girls is even smaller.

Among 15- to 19-year-old boys, 17 per 1,000 fathered a child in 2004 [2]. Like the birth rate among girls, this rate also increased during the late 1980s, peaked in 1991, and is now declining [2].

## CONSEQUENCES OF ADOLESCENT CHILDBEARING

Poverty and its related ills are both a cause and a consequence of teen pregnancy and childbearing. Poor teens are more likely to get pregnant and have children, and teens who have children are more likely to be living in poverty.

Poverty and various manifestations of social disorganization are statistically associated with adolescent childbearing, but estimates of the consequences of early childbearing once rested on incorrect assumptions about the causes of early childbearing. For many years, it was widely believed that poverty and manifestations of social disorganization (e.g., high school dropout rates) were primarily the *consequences* of early childbearing. This belief overstated the actual impact of teenage childbearing because, in fact, poverty and social disorganization were among the *causes* of teenage childbearing as well.

Nevertheless, when adolescents—especially 15- to 17-year-olds—give birth, their future prospects dim in a number of ways [40]. They become less likely to complete high school, less likely to attend college, more likely to have large families, and more likely to be single parents. They work as much as women who delay childbearing for several years, but their earnings must provide for a larger number of people [40; 41].

The most serious consequences of teen childbearing fall on the children. In comparison to children born to mothers age 20 to 21, children whose mothers are 15 to 17 have less supportive and stimulating home environments, less cognitive development, poorer educational outcomes, more behavior problems, higher rates of incarceration (sons) and higher rates of adolescent childbearing themselves [40; 41]. The effects are much smaller when children born to mothers age 18 to 19 are compared to the older mothers.

Finally, adolescent childbearing is costly. After adjusting for other factors related to teen parenthood, births to girls age 19 or younger, instead of to girls age 20 to 21, cost taxpayers at least $9 billion in 2004. This estimate includes only five categories of costs: lost tax revenues, public assistance, health care for the children, child welfare, and the criminal justice system [40]. The costs of each birth to teens age 17 or younger are higher than the costs of each birth to teens 18 or 19.

## SEXUALLY TRANSMITTED DISEASES

Teen sexual activity also leads to high rates of STD. While young people age 15 to 24 represent 25 percent of the sexually active population, they account for about half of all new cases of STD

[42]. Nearly 4 million new cases occur annually among teens and over 6 million among people age 20 to 24 [43]. The prevalence of STD is much higher in some geographic areas. For example, in one community, 40 percent of 14- to 19-year-old girls who came to a teen clinic had an STD [44]. In addition, about one-third of all sexually active young people become infected with an STD by age 24 [43]. Many of them have been treated and cured, but others have not.

The prevalence of STD is typically much higher among African-American and Native American teens than white teens and slightly higher among Hispanic teens than white teens. For example, in 2004, the rates of both gonorrhea and syphilis among African-American 15- to 19-year-olds were about 17 times higher than the rates among white teens [45]. In part, these higher rates reflect greater poverty, less access to health services, more sexual partners, and possibly differences in reporting by clinics serving low-income minority teens [46].

Adolescents have very high age-specific rates of infection for some STDs, such as chlamydia and gonorrhea. When data were analyzed by gender in 2004, teenage girls had the highest reported prevalence of these two STDs, while teenage boys had only slightly lower rates than men in their twenties [45].

Such high rates of infection are caused, in part, by the fact that teens are less likely to be married than older sexually active people and are therefore likely to have more sexual partners. In addition, they may have sex with partners at higher risk of STD and may be less likely to receive health care for curable STDs. For some STDs, such as chlamydia, adolescent girls may also be physiologically more susceptible to infection than older women [45].

Prevention programs that target curable STDs have successfully reduced the prevalence of some of these diseases among adolescents, just as they have among adults. For example, gonorrhea rates declined among both genders until 2005, when they increased slightly, and syphilis rates declined among teenage girls (rates among teenage boys are low and relatively unchanged) [45]. Overall, these diseases have been on the decline among teens in the three major racial/ethnic groups; two exceptions are the relatively unchanged rates of syphilis infection among Hispanic and white teens [45]. The decrease in syphilis rates among African-American teens has been particularly dramatic. In addition, one non-curable STD (herpes simplex virus type 2) declined among teens during the early 2000s [47]. These data demonstrate that it is possible to reduce the prevalence of STDs among teens.

At the same time, however, the prevalence of some incurable STDs has increased among teens during the last three decades. For example, the prevalence of herpes simplex virus type 2 increased substantially through the 1980s and remained constant through the 1990s before declining slightly in the early 2000s [42].

The prevalence of HIV among young adults in general is quite low. An estimate based upon a nationally representative sample of young men and women age 18 to 26 was 1 per 1,000 [48]. The rate was dramatically higher for non-Hispanic black young adults than for other young adults.

Despite the low prevalence of HIV infection, the estimated number of HIV/AIDS cases among teens age 15 to 19 rose between 2001 and 2005. By the end of 2005, 6,324 AIDS cases had been reported among 13- to 19-year-olds in the United States [49]. In addition, in the 33 regions with confidential HIV infection reporting, 5,322 teenagers were reported to be living with HIV/AIDS. Because of the long and variable time between HIV infection and the onset of AIDS, rates of HIV infection provide a more accurate picture of current trends in the epidemic than rates of AIDS. Among teens age 13 to 15, the majority of HIV diagnoses occurred among girls (77 percent), whereas among teens age 16 to 19, slightly more than half of HIV diagnoses occurred among boys (52 percent). For girls the most common mode of transmission was heterosexual contact (often with injection drug users); for boys, it was male-to-male sex [50]. In 2003, approximately

three-quarters of newly diagnosed HIV infections occurred among young African-Americans.

The human and monetary costs of STDs are very high. STDs other than HIV can lead to infertility, ectopic pregnancy, cancer, and other health problems as well as cause long-term emotional suffering and stress. Moreover, having one of these diseases can increase the likelihood of contracting HIV. In 1998, curable STDs among sexually active people of all ages were estimated to cost $8.4 billion per year in direct costs alone [43].

## IMPLICATIONS FOR PREGNANCY AND STD PREVENTION PROGRAMS

These patterns of sexual activity and risk-taking among teenagers, as well as their consequences, lead to ideas that should shape programs designed to prevent teen pregnancy and STDs:

☆ Despite large declines, teen pregnancy rates remain far too high, both in comparison with other developed countries and in terms of the human costs to the teens themselves and especially to their children. Organizations concerned about teen pregnancy should not become complacent about recent progress, but instead should be encouraged to try harder and to build upon past success.

☆ Of particular concern are pregnancies and births to girls age 15 to 17, for the costs to them, their children, and society are greater per pregnancy than the costs associated with girls age 18 or 19.

☆ The prevalence of STDs among teens is also very high. While some of these diseases have declined, others have increased. The costs of STD are high, both to those infected and, particularly in the case of HIV, to society more generally.

☆ Because the human costs of teen pregnancy and STDs are high, and because both outcomes are preventable, committing resources to teen pregnancy and STD/HIV prevention should be a national priority.

☆ ☆ ☆

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- ☆ To reduce unintended teen pregnancy and STD, including HIV, communities must address and change behavior that leads to these outcomes.
- ☆ Teens can avoid pregnancy by abstaining from sex and can reduce their risk of becoming pregnant by using effective contraception. Programs for teens should and do address both types of behavior.
- ☆ Teens can reduce their risk of STD by abstaining from sex, limiting the number of sexual partners, increasing the amount of time between sexual partners, reducing the frequency of sex, using condoms, and being tested and treated for STDs. They can also be vaccinated against hepatitis B and HPV (human papillomavirus), and boys can be circumcised.
- ☆ Most programs focus primarily on abstinence and condoms and to a lesser extent on testing for STDs. They may put too little emphasis on limiting the number of sexual partners, reducing the occurrence of concurrent partners, and other methods of reducing STD risk.
- ☆ Communities and organizations within them should review public health data on pregnancy and STD rates, data on sexual behavior among young people, cultural beliefs and values, and existing educational programs and resources, and should then strive to reach consensus on which types of sexual behavior should be targeted for which groups of teens.
- ☆ Communities and organizations should not only target specific types of sexual behavior but also provide clear, consistent, and appropriate messages about these types of behavior to young people.

# Behavior That Affects Teen Pregnancy and STD

Reducing teen pregnancy, childbearing, and STD are important health goals for this country. To reduce pregnancy and STD, teens must change their sexual behavior. But which types of behavior must they change to reduce pregnancy? And which types of behavior must they change to reduce STD? Most of the answers to these questions are widely known, but not all behavior that must be changed is commonly considered or targeted by prevention programs.

This chapter focuses on behavior that affects pregnancy and STD, and Chapter 3 focuses on the risk and protective factors that affect such behavior. (Fecundity obviously has a bearing on teen pregnancy and childbearing, but since preventive programs do not strive to lower fecundity in order to reduce teen pregnancy, that subject is not discussed here.)

## BEHAVIOR THAT REDUCES TEEN PREGNANCY

Simply put, the more frequently teens have sex without effective contraception, the more likely they are to become pregnant. Therefore, the types of sexual behavior that are likely to reduce pregnancy include abstaining from sex, reducing the frequency of sex among those who are sexually active, and the use of contraception by those who are sexually active. Obviously, young people who abstain from sexual intercourse will not become pregnant, and research shows that those who abstain from sex until they are older are less likely to become pregnant than those who do not abstain [1-6]. Similarly, unless they use contraception correctly and consistently, teens who have sex more frequently are more likely to become pregnant than those who have sex less frequently [7-9]. Finally, the use of contraception greatly decreases the chances of pregnancy [1; 4; 7; 10-17].

The chances of becoming pregnant while using contraception depend on the effectiveness of the method chosen, as well as correct and consist of use of the contraceptive. This chapter does not examine studies of the effectiveness of different methods of contraception; that has been done elsewhere [18]. However, the typical failure rates of contraceptives often used by teens range from 15 percent for condoms and 8 percent for birth control pills to 3 percent for Depo-Provera and less than 1 percent for the IUD (intrauterine device) [18].

Most forms of contraception must be taken or used before or during sexual intercourse, but emergency contraception can be taken afterwards. This is an important point, because one of the most common reasons young people give for not using contraception during sex is that they did not expect to have sex—"it just happened." Emergency contraception is not as effective as other methods of contraception, however, and should not be recommended as the primary method.

Although unprotected sex can lead to unintended pregnancy regardless of whether that sex was voluntary or involuntary, it should be noted that far too often, girls are pressured or forced to have unwanted sex and that physical abuse by

sexual partners and unwanted sex are also related to teen pregnancy (and to STD) [19].

In sum, the following changes in sexual behavior can reduce the chances of pregnancy:

- ☆ Increasing abstinence (both delaying the initiation of sex and increasing the return to abstinence).
- ☆ Reducing the frequency of sex among teens who are sexually active.
- ☆ Increasing the correct and consistent use of effective methods of contraception by teens who are sexually active.

The impacts of multiple programs on these types of sexual behavior, as well as on pregnancy and childbearing, are examined in Chapters 6 and 8.

## BEHAVIOR THAT REDUCES SEXUALLY TRANSMITTED DISEASE

The kinds of behavior affecting STD risk are less obvious, may be more controversial, and therefore warrant more discussion. For the most part, the chances of contracting an STD are determined by the number of possibly infected sexual partners a teen has, the chances that one or more of those partners is in fact infected, and the frequency of unprotected sex with those partners. That is, the more possibly infected sexual partners a teen has, the greater the risk that one of those partners is infected, and the more frequently a teen has unprotected sex with such partners, the greater the chances that the teen will contract an STD.

Like preventing pregnancy, preventing STD is largely determined by behavior, including abstaining from sex, decreasing the number of sexual partners (especially high-risk partners), decreasing the occurrence of *concurrent* sexual partners, increasing the amount of time between sexual partners, decreasing the frequency of sex, increasing condom use, and being tested and treated for STD. In addition, getting vaccinated for specific STDs and being circumcised (for boys) lower the chances of contracting some STDs.

### Abstaining from Sex

Abstaining from vaginal sexual intercourse *greatly* reduces the chances of contracting an STD. This is the most important point to emphasize.

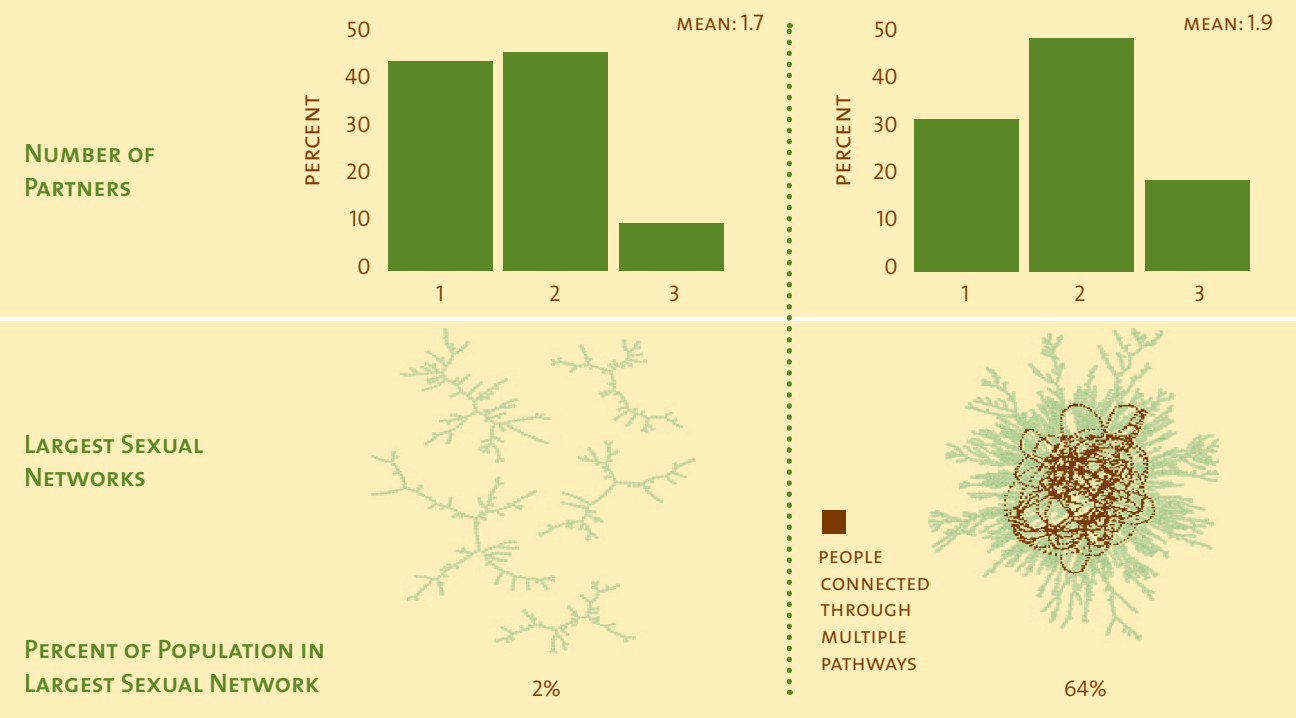
However, avoiding vaginal sex does not eliminate the chances of STD transmission. An STD can easily be transmitted through anal sex [20]. It can also be transmitted through oral sex, although it is *considerably* less likely to be transmitted through oral sex than through vaginal or anal sex [21]. This is true for both heterosexual sex and same-sex sex. (While the focus of this review is on heterosexual behavior, many of the principles regarding STD also apply to same-sex sex.)

Teens who wait until they are older to have sex are less likely to acquire an STD for at least three reasons [22-25]. First, they will not contract any STD while abstaining from sexual intercourse. Second, girls are more susceptible to contracting an STD from an infected person when they are younger because the cervix is less well developed [26]. Third, if teens delay having sex until they are older, they are more likely to use condoms during sex [27-30].

### Reducing the Number of Sexual Partners

Having fewer sexual partners, especially high-risk partners, can substantially reduce the risk of contracting an STD [22; 25; 31-42]. *At the individual level*, the relationship between number of partners and probability of transmission is roughly linear. That is, having four sexual partners poses roughly twice the risk of contracting an STD as having two partners, other things being equal. Conversely, having two sexual partners instead of four reduces the risk by roughly half. *At the population level*, however, the potential for transmission increases exponentially. That is, small increases in the number of sexual partners can greatly increase the risk of STD because they greatly increase the number of people who are connected to each other in sexual networks; conversely, small

Figure 2.1: Impact of Number of Sexual Partners on Size of Sexual Networks




Source: Martina Morris, University of Washington, used with permission from a presentation given at a meeting on concurrent sexual partnerships and sexually transmitted infections, Princeton University, May 6, 2006.

decreases in the number of partners can greatly decrease that risk.

For example, modeling of sexual networks has shown that if a large group of sexually active people all have between one and three partners, for a mean of 1.7 partners, and they increase their mean number of partners to 1.9, an increase of only 0.2 partner, the percentage of people who are in the same sexual network would rise from 2 percent to 64 percent, resulting in a vastly larger sexual network [43] (see Figure 2-1). This is a huge increase, and it demonstrates the impact that number of partners can have on the size of sexual networks through which STDs may be transmitted. Thus, lowering the number of sexual partners by only a small amount can substantially reduce the size of sexual networks and the number of STD infections among a population.

When people avoid having sex with high-risk partners (e.g., people who have had many sexual partners or who have concurrent sexual partners), they reduce their risk of STD. That impact is felt at both the individual level and the population level. In other words, people who have few sexual partners themselves nevertheless face an increased risk of STD if their partners have many sexual partners. At the population level, people with few partners having sex with people who have many partners increases the overall rate of STD [44].

### Decreasing the Occurrence of Concurrent Sexual Partners and Increasing the Time between Partners

Having sexual partners sequentially (one after the other) instead of concurrently (at the same time) can substantially reduce the number of people infected with STDs in a sexual network [45; 46]. For example, if a man who is having sex with two women (concurrent partners) contracts an STD from either one of the women, he may transmit that disease to the other woman. On the other hand, if he ends his sexual relationship with the first woman before having sex with the second woman (sequential partners) and the second

woman infects him, he cannot transmit the disease to the first woman.

Concurrency does not affect the person with multiple sexual partners. That is, if a man has four sexual partners, his risk of STD is the same regardless of whether the partners are concurrent or sequential. It is the risk to his partners that increases if they are concurrent. Thus, to reduce risk at the individual level, people should avoid having sex with a person who has concurrent sexual partners; to reduce risk at the population level, people should avoid having sex with concurrent partners as well as avoid having sex with a partner who has concurrent partners.

Increasing the number of weeks or months between sexual relationships can reduce the chances of infection. The extent to which this is true depends in part on how quickly the infectiousness of a particular STD declines with time. The mean period of infectiousness for STDs (excluding HIV) has been estimated to be as short as two months for gonorrhea and as long as 15 months for chlamydia [47]. People with HIV are especially infectious in the weeks immediately after they themselves became infected. A few weeks later, their infectiousness drops markedly and remains low for years, until the quantity of HIV in their bodies increases and the symptoms of AIDS begin to appear [48].

A longer gap between sexual partners also enables people who have been infected with an STD to notice their symptoms and get tested and treated. They also have more time to get an annual reproductive health checkup.

Concurrency and the time elapsed between partners are related. For people who have two or more sexual partners concurrently, the gap between partners is likely to be shorter than it is for people who have two or more partners sequentially. Thus, concurrency increases the spread of STD both because all concurrent partners can become infected and because the time between partners is likely to be shorter.

### Decreasing the Frequency of Sex

The probability that any STD will be contracted during any single act of vaginal intercourse is less than 1. In fact, the upper limit of the estimated probability of transmission of gonorrhea, one of the most contagious STDs, is about .50 [49]. Other STDs, such as HIV, have a low probability of transmission [48].

This means that a person may not become infected during the first act of sex with infected partners but may become infected during the second, third, or subsequent acts of sex with those partners. Consequently, reducing the frequency of sex (number of acts of sex) with each partner can reduce the chances of contracting an STD [32].

Decreasing the frequency of sex with a potentially infected partner will have *relatively* little impact if the STD is highly infectious because the chances of infection are already high with only a few acts of sex. However, decreasing the frequency of sex with a potentially infected partner will have a much greater impact if the STD is not very infectious because the chances of infection will be small during the first one or two acts of intercourse and will increase with the number of acts of intercourse. Decreasing the frequency of sex with an HIV-positive partner, for example, may markedly reduce the chances of HIV transmission.

### Increasing Condom Use

If condoms are used correctly and consistently, they substantially reduce the probability of contracting an STD [24; 31; 37; 40; 41; 50-53]. This is true of both male and female condoms. How much the probability is lowered depends on the disease. Correct and consistent use of male condoms may reduce the transmission of HIV by roughly 80 to 90 percent [54], but it reduces the transmission of some other diseases by much less [55]. Discharge diseases (e.g., gonorrhea and chlamydia) are transmitted through semen and vaginal secretions. Condoms create a barrier to prevent these fluids from passing from one per-

son to another, thereby reducing the chances of transmitting these diseases. Genital ulcer diseases (e.g., genital herpes) are transmitted primarily by skin-to-skin contact. Condoms may not cover infected areas and in such cases may not protect against these diseases [55].

The effectiveness of condoms depends largely on their not breaking or slipping. Studies have demonstrated that when used correctly, condoms break less than 2 percent of the time [56]. Unfortunately, they are not always used correctly and consistently, so breaking and slipping do occur [57]. In fact, the effectiveness of condoms is more often reduced by inconsistent and incorrect use than by inherent defects.

### Being Tested and Treated for STDs (Including HIV)

If people are tested for STDs and found to be disease-free or tested and then treated, and if they remain in relationships with uninfected partners, they will neither spread nor contract STDs, regardless of how many times they have sex, how many sexual partners they have, or whether they use condoms. Because some STDs are curable, testing and treatment can markedly reduce the chances that partners are infected. In addition, if people learn they have incurable STDs, such as HIV or genital herpes, they may be more likely to use condoms if they do have sex [58; 59] or to take drugs that reduce the probability of transmission (whether by reducing the quantity of virus in the body, as in the case of HIV, or reducing the shedding of cells, as in the case of HSV-2).

While these are the primary methods of reducing the transmission of STDs in general, there are additional means of reducing the transmission of specific STDs.

### Being Vaccinated

Hepatitis B is an STD that can lead to liver failure and death [60]. About 60,000 new cases of the disease occur in the United States each year. Fortunately, a vaccine has been developed that prevents hepatitis B, and the Centers for Disease Control and Prevention recommends that everyone under age 18 be vaccinated [60].

More recently, a vaccine has become available for HPV (human papillomavirus). The vaccine is effective against the four leading types of HPV, which together cause 70 percent of new cases of cervical cancer (as well as 90 percent of new cases of genital warts) [61]. It is also at least partially effective against ten additional types of HPV that cause an additional 20 percent of cases of HPV [62]. The vaccine is new and its long-term effectiveness has not been determined. In the future, vaccines may be developed to protect against other STDs as well.

### Being Circumcised (Boys)

Multiple studies, including both clinical trials and analyses of HIV rates in regions where men are and are not routinely circumcised, have determined that male circumcision reduces the probability of HIV transmission from women to men by 50 to 70 percent [63]. Male circumcision may also protect against the spread of some other STDs from women to men, but such findings are less well established. Male circumcision benefits women indirectly—if men are less likely to become infected by past partners, they are less likely to infect current partners. One of the great advantages of male circumcision is that, unlike most other methods of preventing HIV, it provides lifelong protection.

In sum, changing the following types of sexual behavior can reduce the probability of contracting an STD:

- ☆ Increasing abstinence (both delaying the initiation of sex and increasing the return to abstinence).
- ☆ Reducing the number of sexual partners.
- ☆ Reducing the occurrence of concurrent partners.
- ☆ Increasing the period of time between sexual partners.
- ☆ Decreasing the frequency of sex.

- ☆ Increasing correct and consistent use of condoms.
- ☆ Increasing testing for and treatment of STDs.
- ☆ Being vaccinated against STDs for which vaccines are available.
- ☆ Being circumcised (boys).

All of these actions, except long-term abstinence, present the potential problem of risk compensation. That is, if people use one method of preventing STDs, they may feel safe having sex and therefore increase other risks. People who have few sexual partners, for example, may become less likely to use condoms or to be tested for STDs. If they use condoms, they may feel safe and have more sexual partners or fail to be tested for STDs. If they become vaccinated or are circumcised (if boys), they may be less likely to use condoms, etc. Thus, unless people completely abstain or have only long–term, mutually monogamous relationships with uninfected partners, they may need to take several steps to reduce the risk of contracting or transmitting an STD.

Chapters 6 and 8 examine the impact of many programs on abstinence, number of sexual partners, frequency of sex, condom use, and STD rates. Few studies have measured the impact of programs on the other types of behavior listed above.

## SELECTING THE SEXUAL BEHAVIOR TO TARGET

Currently in the United States, organizations seeking to prevent teen pregnancy target behavior in two areas: abstinence (including delaying the initiation of sex, returning to abstinence, and avoiding unwanted, unintended, and unprotected sex) and the correct and consistent use of effective contraception. For the most part, the kinds of behavior targeted match those identified above as preventing pregnancy.

The same is not true of programs designed to prevent STD among young people. The types of sexual behavior usually targeted by such programs are abstinence and always using condoms if having sex. Some, but much less, emphasis is placed on STD testing and treatment, and only since the recent availability of an HPV vaccine has there been much attention placed on vaccination. Few programs emphasize the importance of having few sexual partners, and almost none mention avoiding concurrent sexual partners (and people who have them), increasing the time between partners, or male circumcision.

As noted in Chapter 1, by the time students graduate from high school, about two-thirds of them will have had sex. Although condoms are the most commonly used method of contraception when young people first have sex, they are less likely to use condoms as they grow older and as their sexual relationships last longer. Moreover, condoms are not 100 percent effective, even when used correctly and consistently—and many young people do not use them correctly and consistently. In addition, girls have less control over the use of male condoms and very few use female condoms. Finally, encouraging only abstinence and condom use fails to take into account other values that teens have about sexual activity, such as having sex in committed and caring relationships. Thus, both abstinence and condom use should continue to be strongly supported, but programs should also encourage sexual behavior that can reduce the risk of STD among teens.

Efforts to lower the risk of STD can build on existing sexual values and behavior. Despite Americans' diverse views on sexual behavior, most of them strongly support having sex only within a loving and caring relationship. In addition, when young people become involved in long-term relationships, they often stop using condoms and turn to hormonal contraception for protection against pregnancy; that is, they are essentially choosing to reduce their risk of STD by having long-term relationships and limiting the number of their sexual partners. Given their sexual values and behavior, young people may be particularly receptive to programs aimed at reducing the number of sexual partners and reducing the frequency of concurrent partners. Such programs will undoubtedly need to address some of the

gender aspects of multiple partners, the desire for multiple partners, and beliefs in long–term, mutually monogamous relationships.

Programs might also emphasize testing for and treatment of STDs, either annually or before two people in a mutually monogamous relationship stop using condoms. Some programs already encourage testing and treatment, and some clinics make testing and treatment readily available to young people. However, few programs advise teens that two people in a mutually monogamous relationship should use condoms until both are tested and treated for STDs.

When deciding which types of behavior to target, communities and organizations within communities should consider the following factors:

- ☆ The relative prevalence of pregnancy and STD and the impact of each.
- ☆ The most common STDs.
- ☆ The ages of the young people becoming pregnant or infected.
- ☆ The characteristics of the sexual networks that spread different STDs in the community.
- ☆ The availability and types of reproductive health services in the community.
- ☆ Cultural beliefs and values regarding teenagers having sex, use of condoms and contraception, vaccinations, and male circumcision.
- ☆ The latest research on the impact of various types of sexual behavior on STD rates.

After taking these factors into consideration, each community or organization must decide what types of sexual behavior to target and what messages about sex it wishes to send teens. The following is an example of how a community might go about this:

- ☆ Encourage young people to delay sex, at least until they are out of high school.

  *This would be consistent with the values of many adults and teens in this country and would markedly reduce teen pregnancy and STD if followed.*

- ☆ Encourage young people who choose to have sex to do so only within long–term, mutually monogamous relationships and always to avoid having concurrent sexual partners or having sex with people who have concurrent sexual partners.

  *This would be consistent with many people's values and would markedly reduce STD if followed.*

- ☆ Encourage girls who choose to have sex to always use hormonal methods of contraception to avoid pregnancy.

  *This would markedly reduce pregnancy if followed (and can be part of a message to encourage the use of a dual method of conception).*

- ☆ Encourage boys who choose to have sex to always use condoms consistently and correctly in order to avoid STD. If they are in long–term, mutually monogamous relationships, they should use condoms until both partners have been tested for STDs. If either partner cannot be trusted to be monogamous, then boys should be encouraged to use condoms always.

  *Obviously, this would markedly reduce STD if followed (and can be part of a dual method of contraception).*

- ☆ Encourage parents to have their sons circumcised shortly after birth.

  *This would reduce HIV transmission.*

- ☆ Encourage parents to have their children vaccinated against hepatitis B, young women to be vaccinated against HPV, and all young people to be vaccinated against other STDs when such vaccines become available.

  *This would reduce the rates of specific STDs for which there are vaccinations but would not affect other STDs.*

The mix of sexual behavior targeted and messages conveyed should be tailored to the needs of different groups in the community. For example, if pregnancy rates are high and STD rates are low, then the emphasis should be on long-term contraceptives or both long-term contraceptives and

condoms. If pregnancy rates are low and STD rates are high, greater emphasis should be placed on condoms. If a particular group of young people tends to have multiple sexual partners, greater emphasis should be placed on reducing the number of partners, always using a condom, and being tested annually.

In general, communities are best served by assessing the prevalence of pregnancy and various STDs, clarifying their values about teen sexual behavior, considering the availability of different types of health services (including access to contraceptives, STD testing and treatment, and HPV vaccinations), and then reaching agreement about what kind of behavior should be emphasized among different age groups and what organizations should emphasize each kind of behavior.

While not all organizations will want to give equal weight to all types of sexual behavior or to all aspects of a complex behavioral message, it is important that organizations avoid sending conflicting messages to young people. Some faith-based organizations, for example, might wish to emphasize abstinence more than other methods of avoiding pregnancy and STD, whereas some clinics might wish to emphasize contraception, testing and treatment, and vaccination. These different emphases will not produce conflicting messages unless the faith-based organizations denigrate the effectiveness of contraception, testing, and so on, or the clinics denigrate the effectiveness of abstinence and faithfulness in long-term relationships. Most important, across all the organizations that emphasize different types of behavior, there should be an appropriate balance among the different types.

## IMPLICATIONS FOR PREGNANCY AND STD/HIV PREVENTION PROGRAMS

The research on how various types of sexual behavior affects pregnancy and STD has several implications for prevention programs:

- ☆ Teens can avoid pregnancy by abstaining from sex and can reduce their risk by using effective contraception. Programs for teens should and do address both types of behavior.
- ☆ Teens can reduce their risk of STD by abstaining from sex, limiting the number of sexual partners, avoiding concurrent sexual partners, increasing the time between partners, reducing the frequency of sex, using condoms, and being tested and treated. They can also be vaccinated against hepatitis B and HPV, and boys can be circumcised. However, most programs focus primarily on abstinence and condoms, and to a lesser extent on testing for STDs. They often pay too little attention to limiting the number of sexual partners, reducing the occurrence of concurrent partners, and other methods of reducing STD risk.
- ☆ Communities and organizations within them should review public health data on pregnancy and STD rates, data on sexual behavior among young people, their cultural beliefs and values, and existing educational programs and resources. They should strive to reach consensus on which types of behavior should be targeted among which groups and by whom.
- ☆ In general, encouraging teens to postpone the initiation of sex or to become sexually abstinent should be important goals of many comprehensive pregnancy and STD prevention initiatives, not just those that advocate abstinence alone. As noted in Chapter 1, many young people have sex at an early age, thereby increasing the rates of pregnancy and

STD. Furthermore, the apparent decline in the percentage of young people who had ever had sex in the 1990s demonstrates that the trend toward earlier initiation of sex could be reversed. Abstinence is the most effective way to avoid teen pregnancy and STD, and it is the only option for unmarried teens that some people can support.

☆ Because the frequency of sex increases the chances of pregnancy and the number of sexual partners dramatically affects the spread of STD, many programs should encourage young people to limit their sexual activity, and especially to limit their number of sexual partners. If they limit the number of partners, they are also likely to have fewer concurrent sexual partners and to increase the time between partners.

☆ Comprehensive pregnancy prevention initiatives should also promote consistent and correct use of effective methods of contraception by young people who do have sex. Similarly, comprehensive STD prevention programs should promote consistent and correct use of condoms. When possible and appropriate, both types of programs should promote dual use of condoms and long-term methods of contraception. During the last few decades, the use of condoms and other contraceptives by sexually experienced teens has increased and pregnancy rates have declined, demonstrating that efforts to improve contraceptive use can result in lower pregnancy rates. Similarly, more frequent use of condoms has undoubtedly contributed to the decreased prevalence of some STDs. Condoms and other contraceptives are preventive approaches that a large majority of people support, in combination with an emphasis on abstinence.

☆ Programs that address the use of condoms and other contraceptives should recognize that sexual activity among teens is often sporadic, that teens often have sex without planning to do so ahead of time, and that they therefore do not always use contraception. Among other things, teens need to identify the situations in which they are most likely to have unplanned and unprotected sex; to learn skills that will help them avoid those situations; and to be knowledgeable about and have access to condoms, to long-lasting methods of contraception and emergency contraception that do not require planning just before or during sex, and to testing for and treatment of STDs.

☆ Whenever appropriate, programs to prevent pregnancy and programs to prevent STDs should target both outcomes, because abstinence and condoms protect against both outcomes; the desire to avoid STD, like the desire to avoid pregnancy, causes some adolescents to avoid sex or to use condoms; and the costs of both outcomes are high. Programs that focus on STD should emphasize the importance of screening and treatment for teens who might be infected.

☆ Programs should not only target various types of sexual behavior, but also provide clear, consistent, and appropriate messages about these types of behavior to young people in their communities.

☆ ☆ ☆

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- ☆ More than 500 factors are known to increase or decrease the chances that teens will engage in risky sexual behavior.
- ☆ Both risk and protective factors influence teen sexual behavior.
- ☆ Some factors involve sexuality directly; others affect sexuality indirectly.
- ☆ Risk and protective factors are rooted in:
  - communities (e.g., exposure to violence and substance use),
  - families (e.g., the presence of both biological parents, parents who express and model responsible values about sex and contraception, a close relationship with parents),
  - friends and peers (e.g., poor performance in school, drug use, permissive and unprotected sex),
  - romantic partners (e.g., an older boyfriend),
  - teens themselves (e.g., values, attitudes, perceptions of peer norms, self-efficacy, and intentions about sex or the use of contraception).
- ☆ Of the more than 500 known factors, teens' own sexual beliefs, values, and attitudes are the most strongly related to sexual behavior.
- ☆ Some factors can be more easily modified through programmatic interventions than others.
- ☆ Organizations concerned with preventing teen pregnancy and STD should focus on factors that are most strongly related to sexual behavior and can be changed markedly by the organizations' programs.

# Factors That Affect Teens' Sexual Behavior

Parents and other concerned adults cannot control teens' sexual behavior directly, but they can attempt to affect the factors that influence teens' sexual decisions and behavior. Logic and experience suggest that the more people know about those factors and the more effectively people address them, the more success they'll have in reducing sexually risky behavior.

Understanding the factors that influence teen sexual behavior is necessary not only for changing behavior, but also for identifying teens who are most at risk of having sex and having unprotected sex. First people can use these factors to identify those teens at greater risk; then they can address the important factors affecting teen behavior. This chapter summarizes many of the important factors and explains their implications for people working to help young people avoid sexual risk-taking.

Factors that influence teens' sexual decisions and behavior include both risk factors and protective factors. *Risk factors* encourage behavior that could result in a pregnancy or STD or discourage behavior that could prevent those outcomes. *Protective factors* discourage behavior that could lead to a pregnancy or STD or encourage behavior that can prevent them. Risk and protective factors may be equally important. If the risk factors in a teen's life diminish or the protective factors increase, or both, the teen will be much less likely to have sex, fail to use condoms or other forms of contraception, become pregnant or cause a pregnancy, or contract an STD.

This chapter uses the words "encourage behavior" and "discourage behavior" to describe the effects of risk and protective factors because the terms imply causality. Causality is important because the goal of most programs is to change behavior. If a factor is only correlated with a behavior, and does not actually affect that behavior, then changing the factor will not change the behavior.

Research cannot always demonstrate causality, and readers should always question whether a risk or protective factor actually influences a sexual behavior or is just related to it. Unless specifically noted, all of the factors discussed in this chapter have shown some evidence that they have a causal impact on behavior.

Since parents and other adults cannot change teen behavior directly, the question becomes: Which risk and protective factors should they target? The answer is twofold:

- ☆ Factors that have a significant causal impact on one or more types of sexual behavior affecting the incidence of teen pregnancy or STD, and
- ☆ Factors that can be changed markedly by parents or other people or organizations concerned with teen pregnancy and sexual health.

Logically, if a risk or protective factor satisfies only one of these two criteria, it is not worth targeting, because it will not reduce pregnancy or STD rates. In other words, an unchangeable factor that affects sexual behavior is no more

worth pursuing than a changeable factor that does not affect sexual behavior significantly.

This conclusion raises two very important questions, both of which this chapter attempts to answer:

- ☆ Which factors have the greatest causal impact on adolescent sexual behavior?
- ☆ Which factors are most amenable to change by pregnancy and STD/HIV prevention programs?

## METHODOLOGY

This chapter summarizes the results of about 450 studies of risk and protective factors [1]. To be included, the studies had to meet the following criteria:

- ☆ Be conducted in the United States.
- ☆ Examine the impact of factors on initiation of sex, frequency of sex, number of partners, condom or other contraceptive use, pregnancy, childbearing, or STD.
- ☆ Be based on a sample of teenagers roughly 18 or younger.
- ☆ Have a sample size of at least 100 teens for significant results and at least 200 teens for nonsignificant results.
- ☆ Meet scientific criteria required for publication in professional peer-reviewed research journals or other publications.
- ☆ Be published between 1990 and 2007, inclusive.
- ☆ Include multivariate analyses.

## WHAT FACTORS AFFECT TEEN SEXUAL BEHAVIOR MOST?

The studies revealed that more than 500 factors affect one or more of the eight important measures of teen sexual behavior and its outcomes: age at which sex is initiated, frequency of sex, number of partners, use of condoms, use of other methods of contraception, pregnancy, childbearing, and STD.

Nearly all young people experience pressures of some kind to have sexual intercourse and are therefore at risk of pregnancy and STD. It is simply not the case that only one group of teens, only one ethnic group, only low-income teens, only teens in a particular neighborhood, or only students in "other" schools engage in sex and become pregnant or contract an STD. Sexual activity, pregnancy, and STD cut across all of these groups.

Risk and protective factors increase or decrease the chances that a teen will engage in risky sexual behavior. As noted above, the presence of more risk factors and fewer protective factors in a teen's life increases the chances that that teen will have unprotected sex and become pregnant (or cause a pregnancy) or contract an STD.

Because so many factors affect teen sexual behavior, focusing on only one of them is unlikely to have much impact unless that factor is an extremely important one (e.g., intention to have sex). Targeting several important factors is a more promising approach. To that end, this chapter focuses on the most important factors and the dominant themes among them. Table 3-1 includes factors that show the strongest and most consistent evidence of significantly affecting teens' sexual behavior.[1]

1. To be included in Table 3-1, four conditions had to be met: 1) the pattern of results across studies indicating that a particular factor significantly affects behavior could not have occurred by chance; 2) at least two-thirds of the studies had to show that a particular risk or protective factor exerted a consistent, significant effect on behavior, rather than being not significant or having significant results in the opposite direction (this "2 to 1" rule excludes many factors, but increases the chances that a factor will be important in every community); 3) at least three multivariate studies had consistently to support the conclusion that a particular factor was a risk (or protective) factor for a particular behavior; and 4) at least one of the studies had to have a large sample size.

### Table 3.1: Important Risk and Protective Factors and the Feasibility of Changing Them

| Risk (-) and Protective (+) Factors | Feasibility of Changing[1] | Possible Interventions to Change Factors |
|---|---|---|
| **Environmental Factors** | | |
| **Community** | | |
| **PERCENTAGE FOREIGN-BORN** | | |
| + High proportion of foreign-born residents | * | In general, pregnancy and STD prevention programs cannot affect the percentage of foreign-born residents in a community. |
| **COMMUNITY DISORGANIZATION** | | |
| - Greater community social disorganization (e.g., violence, hunger, substance use) | | In general, pregnancy and STD prevention programs do not have the resources or capability of markedly changing community-wide social disorganization. In some communities, these and other programs can collaborate to address larger social issues. |
| **Family** | | |
| **FAMILY STRUCTURE** | | |
| + Live with two parents (vs. one parent or step-parents) | * | In general, pregnancy and STD prevention programs cannot affect marital status, divorce risk, or living arrangements of families. If their agencies offer marriage or family counseling, they may be able to help parents stay together. |
| - Family disruption (divorce, change to single-parent household) | * | |
| **EDUCATIONAL LEVEL** | | |
| + High level of parental education | * | In general, pregnancy and STD prevention programs cannot affect parents' educational level. In some communities, programs with a holistic approach may be able to provide guidance and counseling to parents and encourage and facilitate their obtaining a higher education. |
| **SUBSTANCE ABUSE** | | |
| - Household substance abuse (alcohol or drugs) | ** | In general, pregnancy and STD prevention programs can have little effect on whether parents or siblings of teens abuse alcohol or drugs. Some programs may be able to provide alcohol and drug abuse prevention programs and thereby reduce parental abuse. |

1.

* = Extremely difficult for most pregnancy and STD prevention programs to change directly themselves, although they can work with other agencies to change policies.

** = Difficult for most pregnancy and STD prevention programs to change unless they have special programs or capabilities.

*** = Most amenable to change directly by pregnancy and STD prevention programs. These factors are italicized.

Table 3.1: Important Risk and Protective Factors and the Feasibility of Changing Them (Con't.)

| Risk (-) and Protective (+) Factors | Feasibility of Changing[1] | Possible Interventions to Change Factors |
|---|---|---|
| **POSITIVE FAMILY DYNAMICS AND ATTACHMENT** | | |
| + High-quality family interactions, connectedness, satisfaction with relationships | ** | In general, pregnancy and STD prevention programs can have little effect on family interactions and connectedness. Some agencies may be able to provide intensive family guidance and counseling and thus affect family interactions. |
| + Greater parental supervision and monitoring | ** | In general, pregnancy and STD prevention programs can have little effect on parental supervision and monitoring. Some more holistic programs may be able to implement programs for parents that encourage them to supervise and monitor their teen children appropriately. |
| - Physical abuse and general maltreatment | ** | In general, pregnancy and STD prevention programs can have little effect on physical abuse and maltreatment within the family. Some agencies may be able to provide intensive family guidance and counseling and thus affect abusive behavior. |
| **FAMILY ATTITUDES ABOUT AND MODELING OF SEXUAL RISK-TAKING AND EARLY CHILDBEARING** | | |
| - Mother's early age at first sex and first birth | * | Programs cannot affect a teen's mother's prior behavior. Programs can prevent teens from becoming mothers and thereby help the next generation. |
| - Older sibling's early sexual behavior and early age at first birth | ** | In general, pregnancy and STD prevention programs cannot affect the previous behavior of older siblings. They can affect the behavior of teens, who may have younger siblings. |
| + Parental disapproval of premarital sex or teen sex | ** | Pregnancy and STD prevention programs can provide parents with accurate information about teen sexual behavior and its consequences. Some programs, especially faith-based ones, may emphasize conservative religious values about premarital sex and teen sex. Many programs may encourage parents to talk to their teens about abstaining from having sex. |
| + Parental acceptance and support of contraceptive use for sexually active teens | ** | Pregnancy and STD prevention programs can provide parents with accurate information about teen sexual behavior, its consequences, and the effectiveness of condoms and contraception. Some programs may be willing to talk to parents about encouraging their teens to use contraception if they do have sex. |
| **COMMUNICATION ABOUT SEX AND CONTRACEPTION** | | |
| + Greater parent-child communication about sex and condoms or contraception, especially before teen initiates sex | *** | Pregnancy and STD prevention programs can increase parent-child communication about sex, condoms, and other contraception through school homework assignments, special programs for parents, college courses for parents, and other approaches. |

### Table 3.1: Important Risk and Protective Factors and the Feasibility of Changing Them (Con't.)

| Risk (-) and Protective (+) Factors | Feasibility of Changing[1] | Possible Interventions to Change Factors |
|---|---|---|
| **Peer** | | |
| **AGE** | | |
| - Older age of peer group and close friends | ** | In general, pregnancy and STD prevention programs cannot easily affect the age of teens' peers. Some programs may be able to provide activities that encourage teens to interact with people their own age or encourage same-age friends in other ways. |
| **PEER ATTITUDES AND BEHAVIOR** | | |
| - Peers' alcohol use, drug use, deviant behavior | ** | If friends can be reached, some pregnancy and STD prevention programs with a youth development emphasis may be able to reduce alcohol and drug abuse and other non-normative behavior. |
| - Peers' pro-childbearing attitudes or behavior | *** | If peers can be reached, sex education programs can reduce pro-childbearing attitudes and behavior. If peers cannot be reached, programs can implement activities in small or large group settings that demonstrate peer support for avoiding pregnancy. |
| - Permissive values about sex | *** | If friends can be reached, agencies can implement effective abstinence or sex and STD/HIV education programs that change permissive values and delay the initiation of sex. If peers cannot be reached, programs can implement activities in small or large group settings that demonstrate peer support for delaying sex. |
| - Sexually active peers | *** | If friends can be reached, abstinence or sex and STD/HIV education programs can change permissive values about sex and delay the initiation of sex. If friends cannot be reached, programs can implement activities demonstrating that perceptions of peer sexual activity are typically exaggerated. |
| + Positive peer norms or support for condom or contraceptive use | *** | If friends can be reached, sex and STD/HIV education programs or clinic protocols can increase both support for condom and contraceptive use and actual use of condoms and contraceptives. If peers cannot be reached, programs can implement activities in small or large group settings that demonstrate peer support for condom and contraceptive use for sexually active teens. |
| + Peer use of condoms | *** | If peers can be reached, sex and STD/HIV education programs can increase condom use. If peers cannot be reached, programs can implement activities in small or large group settings that demonstrate peer support for condom use. |

Table 3.1: Important Risk and Protective Factors and the Feasibility of Changing Them (Con't.)

| Risk (-) and Protective (+) Factors | Feasibility of Changing[1] | Possible Interventions to Change Factors |
|---|---|---|
| **Romantic Partner** | | |
| **PARTNER CHARACTERISTICS** | | |
| - Having a romantic partner who is older | ** | Pregnancy and STD prevention programs can encourage teens to date people their own age. Such efforts have not yet been evaluated. |
| + Partner support for condom and contraceptive use | ** | If partners can be reached, sex and STD/HIV education programs can improve attitudes toward condom and contraceptive use. If partners cannot be reached, programs can implement activities in small or large group settings that demonstrate peer support for condom use. |
| **Individual Factors** | | |
| **BIOLOGICAL FACTORS** | | |
| +/- Being male | * | Within reason, it is not possible to change these factors. |
| +/- Being older | * | |
| +/- Being physically more mature | * | |
| **RACE/ETHNICITY** | | |
| - Being African-American (vs. white) | * | Pregnancy and STD prevention programs cannot affect race or ethnicity, but sometimes, in collaboration with other programs, they can help reduce minority poverty or minority cultural values that may contribute to sexual risk. |
| - Being Hispanic (vs. non-Hispanic white) | * | |
| **ATTACHMENT TO AND SUCCESS IN SCHOOL** | | |
| + Greater connectedness to school | ** | Some pregnancy and STD prevention programs with a youth development emphasis may be able to implement tutoring, mentoring, job shadowing, arts, sports, service learning, or other initiatives to help keep teens in school, keep them involved, improve their grades, and improve their aspirations. |
| + Higher academic performance | ** | |
| - Being behind in school or having problems in school | ** | |
| + High educational aspirations and plans for the future | ** | |
| **ATTACHMENT TO COMMUNITY** | | |
| + Being involved in the community | ** | Some pregnancy and STD prevention programs with a youth development emphasis may be able to implement arts, sports, service learning, or other community programs to help teens be involved in their communities. |

Table 3.1: Important Risk and Protective Factors and the Feasibility of Changing Them (Con't.)

| Risk (-) and Protective (+) Factors | Feasibility of Changing[1] | Possible Interventions to Change Factors |
|---|---|---|
| **ATTACHMENT TO FAITH COMMUNITIES** | | |
| + Having a religious affiliation | ** | Most pregnancy and STD prevention programs cannot strive to increase involvement in religious organizations. However, faith communities can implement youth programs or initiatives that may increase young people's involvement and improve their understanding of their religion's values about sexuality. |
| **PROBLEM OR RISK-TAKING BEHAVIOR** | | |
| - Alcohol use | ** | Some pregnancy and STD prevention programs with a youth development emphasis may be able to offer initiatives that reduce alcohol or drug use. |
| - Drug use | ** | |
| - Being part of a gang | ** | Some pregnancy and STD prevention programs with a youth development emphasis may be able to implement initiatives that reduce gang membership. |
| - Physical fighting and carrying weapons | ** | Some pregnancy and STD prevention programs with a youth development emphasis may be able to implement initiatives that reduce fighting, violence, and other problem behavior. |
| - Other problem behavior or delinquency | ** | |
| **OTHER BEHAVIOR** | | |
| - Working for pay more than 20 hours per week | ** | Most pregnancy and STD prevention programs will not wish to discourage teens from working and having the greater autonomy that accompanies work. However, some may be willing to discourage teens from working more than 20 hours per week. |
| + Involvement in sports (girls only) | ** | Some pregnancy and STD prevention programs with a youth development emphasis may be able to implement sports programs for girls. |
| **COGNITIVE AND PERSONALITY TRAITS** | | |
| + Higher level of cognitive development | ** | Most pregnancy and STD prevention programs are not designed to increase cognitive development. Some with a youth development emphasis may be able to implement initiatives that increase cognitive development slightly. |
| + Greater internal locus of control | ** | A teen's locus of control is difficult to change. Some programs with an intensive youth development focus may be able to improve teens' internal locus of control. |
| **EMOTIONAL WELL-BEING AND DISTRESS** | | |
| - Depression and thoughts of suicide | ** | Most pregnancy and STD prevention programs are not equipped to address depression or thoughts of suicide. Some programs may be able to refer teens to agencies that provide needed help or may provide such services themselves. |

Table 3.1: Important Risk and Protective Factors and the Feasibility of Changing Them (Con't.)

| Risk (-) and Protective (+) Factors | Feasibility of Changing[1] | Possible Interventions to Change Factors |
|---|---|---|
| **SEXUAL BELIEFS, ATTITUDES, AND SKILLS** | | |
| - More permissive attitudes toward premarital sex | *** | Pregnancy and STD prevention programs can implement abstinence education, sex and STD/HIV education, and clinic protocols that target these factors. Such initiatives have been demonstrated to delay the initiation of sex, reduce the frequency of sex and the number of partners, and increase condom or contraceptive use. |
| + Taking a virginity pledge | *** | |
| + Greater perceived male responsibility for pregnancy prevention | *** | |
| + Stronger beliefs that condoms do not reduce sexual pleasure | *** | |
| + Greater value of partner appreciation of condom use | *** | |
| + More positive attitudes toward condoms and other forms of contraception | *** | |
| + More perceived benefits and/or fewer costs and barriers to using condoms | *** | |
| + Greater confidence in ability to demand condom use | *** | |
| + Greater confidence in using condoms or other forms of contraception | *** | |
| + Greater motivation to use condoms or other forms of contraception | *** | |
| + Greater intention to use condoms | *** | |
| + Greater perceived negative consequences of pregnancy | *** | |
| + Greater motivation to avoid pregnancy and STD | *** | |

### Table 3.1: Important Risk and Protective Factors and the Feasibility of Changing Them (Con't.)

| Risk (-) and Protective (+) Factors | Feasibility of Changing[1] | Possible Interventions To Change Factors |
|---|---|---|
| **RELATIONSHIPS WITH ROMANTIC PARTNERS AND PREVIOUS SEXUAL BEHAVIOR** | | |
| - Dating more frequently | ** | Pregnancy and STD prevention programs can encourage parents to appropriately monitor and supervise teen dating and going steady. Programs can also encourage young people to delay dating and going steady and to participate in group activities rather than one-on-one dates. Such efforts have not been evaluated. |
| - Going steady, having a close relationship | ** | |
| - Ever kissed or necked | ** | |
| + Older age at first voluntary sex | *** | Pregnancy and STD prevention programs can implement abstinence education and sex and STD/HIV education that have been demonstrated to delay the initiation of sex. |
| - Greater frequency of sex | *** | Some sex and STD/HIV education programs and clinic protocols can reduce the frequency of sex and the number of sexual partners (and hence the number of new sexual relationships). Others can encourage young people in new sexual relationships to begin using contraception earlier in their relationship. |
| - Having a new sexual relationship | *** | |
| - Greater number of sexual partners | *** | |
| + Discussing sexual risks with partner | *** | Pregnancy and STD prevention programs can implement sex and STD/HIV education and clinic protocols that increase communication about sexual risks and prevention of pregnancy and STDs. |
| + Discussing pregnancy and STD prevention with partner | *** | |
| + Previous effective use of condoms or contraception | *** | Pregnancy and STD prevention programs can implement sex and STD/HIV education programs and clinic protocols that increase condom and contraceptive use, thereby reducing the risk of pregnancy and STDs. |
| - Previous pregnancy or impregnation | *** | |
| - History of prior sexual coercion or abuse | * | Pregnancy and STD prevention programs typically are not equipped to address the consequences of past sexual abuse or to prevent subsequent abuse. They can refer sexually abused young people to intensive, specialized counseling services, if they exist, and some programs may be equipped to implement support groups for victims. |
| - Same-sex attraction or sexual behavior | ** | Pregnancy and STD prevention programs cannot affect sexual orientation, but some programs designed for gay, lesbian, and questioning youth may be able to reduce their sexual risk-taking. |
| - Being married | ** | Most programs do not include delaying marriage in their mission. Some programs, especially those with counseling components, may encourage young people to think seriously about the implications of early marriage. |

The factors identified in Table 3-1 support a wide variety of theories about risky adolescent sexual behavior—theories involving social disorganization in the community, theories involving parenting practices and parent values about adolescent sexuality, biological theories, theories suggesting that sexual risk-taking is part of a larger syndrome of risk-taking or deviant behavior, and social psychological theories of rational behavior. No single theoretical perspective is sufficient to explain teens' sexual behavior: the overall picture is much more complex.

## Environmental Factors

Four groups of factors found to be most influential on teens' sexual behavior are environmental. Those factors characterize the community in which a teen lives, his or her family, peers and best friends, and the teen's romantic partners.

### *Community*

The community a teen lives in influences his or her sexual behavior. In particular, teens who live in disorganized communities—those with higher rates of substance abuse, violence, and hunger—are more likely to begin having sex early and to have a child. Teens who live in communities with a higher proportion of foreign-born residents are more likely to delay having sex. According to at least one study, this finding may reflect the less permissive sexual values of foreign-born parents.

### *Family*

Family characteristics are very important in determining risk. Teens who live with both parents and enjoy close relationships with them are less likely to have unprotected sex and become pregnant. Specifically, if teens live with both biological parents (instead of only one parent or step-parents), they are less likely to have sex, but if they do, they are likely to have sex less frequently. A majority of studies find that teens living with both parents are less likely to become pregnant (or cause a pregnancy) or to give birth (or father a child). If biological parents divorce or separate, their children are more likely to initiate sex at an early age than if the parents do not divorce or separate.

Teens whose parents are more educated are less likely to become pregnant than teens whose parents have less education. Family income is also a factor: the majority of studies found that teens in families with higher incomes were less likely to become pregnant or to bear children. These findings regarding parents' education and income may reflect the emphasis that many such parents place on obtaining an education, pursuing a career, and avoiding early childbearing, as well as, to some extent, the greater resources available to support teens in these pursuits.

If teens experience considerable parental support and feel connected to their parents, they are less likely to initiate sex at an early age, and they have sex less frequently. If parents monitor and supervise their teens appropriately, the teens are likely to have fewer sexual partners than if parents do not monitor them (or, according to at least one study, if parents monitor them excessively). At the extreme, if teens have been maltreated and physically abused by their families, then they are much more likely to have sex at an early age and to become pregnant.

Family abuse of alcohol or drugs increases the chances that teens will have sex more frequently and with more partners. There are two possible reasons for this effect: family substance abuse may encourage young people to drink and use drugs themselves, which can lead to more frequent sex with more partners, or family substance abuse may simply be a marker for more general family dysfunction, which can lead to sexual risk-taking by teens.

If family members, especially parents, express values or model behavior consistent with sexual risk-taking or early childbearing, teens are more likely to have unprotected sex and become pregnant (or cause their partners to become pregnant). Parents may do this in a variety of ways, including conveying permissive attitudes about premarital sex or teen sex, voicing negative attitudes about contraception, or having been

teen parents themselves. Similarly, teens whose older siblings model early sex or childbearing are more likely to have early sex themselves. In contrast, parental disapproval of teen sex reduces the chances that teens will have sex, and parental support of contraceptive use increases the chances that teens will use contraception if they do have sex.

When parents have conversations with their children about sex and contraception well before the children become sexually active, the initiation of sex may be delayed and the use of condoms or other contraceptives increased. This effect is most likely to occur when the teen is a daughter, when the parent is the mother, when the teens and their parents feel connected to one another, when the parents disapprove of teens having sex or support contraceptive use, and when parents can discuss sexuality in an open and comfortable manner.

*Peers and best friends*

Sexual behavior is one of the many areas in which teens are influenced by their best friends and peers. Teens are more likely to have sex if their best friends and peers are older, use alcohol or drugs, or engage in other negative behavior. Similarly, they are more likely to have sex if they believe their friends have more positive attitudes toward childbearing, have permissive values about sex, or are actually having sex. If teens believe their friends support condom use or actually use condoms, chances are greater that they will use condoms themselves.

*Romantic partners*

While simply having a romantic partner increases the chances of sexual activity, having an older romantic partner increases them even further. Having an older partner also lowers the chances that contraception will be used and increases the chances of pregnancy and contracting an STD. If teens' partners support condom or contraceptive use, then teens are more likely to use them if they have sex.

## Individual Factors

Fifteen groups of factors found to be particularly influential on teens' sexual behavior are classed as individual. They include biological factors, race and ethnicity, connection to family, connection to school and to doing well in school, connection to religion, connection to other organizations or adults in the community, involvement in gangs, alcohol and drug use, aggressiveness, involvement in problem or sensation-seeking behavior, paid work, involvement in sports, cognitive and personality traits, sexual beliefs, attitudes, skills, motivations, and intentions, and relationships with romantic partners and previous sexual behavior.

*Biological factors*

Studies have found that age, physical development, and gender have a dramatic effect on teens' sexual behavior. As they become older, teens are much more likely to have sex. Moreover, if they mature physically at an early age, begin menarche early, and appear older than their age, they are also more likely to initiate sex early.

Some effects of getting older are strictly physical, including increased sexual maturity and higher testosterone levels, which may lead to a greater desire for intimacy and sex, greater sexual attractiveness, or both. Other effects are social, such as increased pressure from peers to have sex, changes in perceived norms about sexual and contraceptive behavior, and increased opportunities to have sex, which come with greater freedom and independence.

In addition, teens are likely to have sex more frequently and with more partners as they get older. When teens first have sex, they most often use condoms, in part because they have sex sporadically; older teens are more likely to use long-lasting methods of contraception, such as oral contraceptives or Depo Provera. At the same time, teens are increasingly likely to become pregnant (or to impregnate someone) and to parent a child as they grow older. In other words, because more teens have sex more often as they grow older,

they are increasingly likely to become pregnant, even though they may also be more likely to use contraception.

A teen's gender is another very important biological factor. Overall, boys claim that they have more sexual partners and use condoms more often, although these findings may reflect response biases. Girls are more likely to contract an STD.

Age and gender interact with other factors. For instance, having an older romantic partner increases the likelihood of sexual intercourse for all teens; however, the likelihood is greater for younger teens, especially those in middle school, than for older teens. This factor is also more important for girls than for boys.

Some of these biological factors simply cannot be changed. However, organizations can use them to identify young people who may be more susceptible to sexual risk-taking. Furthermore, organizations can change some attitudes associated with biological factors, such as perceptions of gender roles or expectations of sexual activity for different age groups.

*Race and ethnicity*

Compared to non-Hispanic white teens, African–American teens are more likely to have sex at an earlier age, to have more sexual partners, to become pregnant, to give birth, and to contract an STD. Findings are mixed regarding condom use, with a few studies indicating that African-American teens are more likely to use condoms than non-Hispanic white teens.

Hispanic teens are more likely to become pregnant than non-Hispanic white teens. Most studies indicate they are not more likely to have sex at an early age, but some studies indicate they are less likely to use contraception.

Some of the effects of race and ethnicity diminish when studies take into account family or community education, employment, and income. That is, it is not simply minority status per se that affects teen sexual behavior, pregnancy, and STD risk, but rather the poverty and lack of opportunity often associated with being in a minority group that affects those outcomes. Yet studies have found that controlling for socioeconomic status does not erase the effects of minority status on teen sexual behavior or pregnancy. This finding suggests that cultural values—such as greater emphasis on the family, greater acceptance of early childbearing, or expectations of submissiveness to men—may also contribute to the effects of race and ethnicity. Still other factors, such as experiencing discrimination or racism, may also play a role.

*Connection to family*

Connection to family is both an individual characteristic and a family characteristic. It is discussed above under family characteristics.

*Connection to school and success in school*

When teens stay in school, feel connected to their schools, earn good grades, do not fall behind in school, have plans for higher education beyond high school, avoid problems in school, or do all of these, they initiate sex later and are less likely to have children.

Several studies have found that involvement in school organizations is related to less sexual risk-taking. A methodologically strong study found that simply belonging to school organizations had no impact on teen childbearing; however, the study did find that substantial involvement in school organizations, particularly in school-based religious organizations among non-Hispanic white teens and in school clubs among African–American teens, was related to lower rates of teen childbearing.

*Connection to religion*

Teens who have a strong religious affiliation are less likely to initiate sex, and some studies indicate that teens who attend religious services frequently are less likely to have sex. The direction of causality is not entirely clear, however. Just as attachment to faith communities may affect

sexual behavior, sexual behavior may also affect attachment to faith communities. For example, teens who have had sex may feel less comfortable in places of worship and may be less likely to attend services.

*Connection to other community organizations or adults*

When teens are more involved in their communities and have mentors, they are less likely to engage in sexual behavior.

*Involvement in gangs*

Several studies suggest that teens who belong to gangs are more likely to have sex, to have more sexual partners, and to become pregnant. It is not clear whether gang membership per se produces this elevated risk or simply the fact that teens in gangs have other risk factors as well.

*Alcohol and drug use*

Numerous studies have found relationships between teens' use of alcohol and illegal drugs and an increased likelihood of having sex, having sex more often, having sex with more partners, and pregnancy.

It is plausible that drinking alcohol and using drugs may lower inhibitions, diminish the ability to assess risks, or increase sexual aggression, thus accounting for the measured relationship between alcohol and drugs and teen sexual activity. However, it is also possible that part or all of the effect is caused by other factors, such as poor performance in school, general risk-taking or sensation-seeking, lack of parental monitoring, and so on.

One study that controlled for some of these factors found that use of alcohol and other drugs was not related to sexual activity for either gender, nor was it related to use of female methods of contraception. However, drinking alcohol was negatively related to boys' use of condoms. Another study found that, while both alcohol and drug use in the past were negatively related to condom use, drug and alcohol use during the most recent sex was not negatively related to use of condoms. This finding suggests that something other than lowered inhibitions at the time of sex may explain the relationship. Still other studies have found either no relationship between substance use and sexual risk-taking or no significant relationship once other factors were controlled. Although alcohol and other drug use are included in Table 3-1, their causality is questionable.

*Aggression*

Physical fighting and carrying weapons are also related to having sex, more sexual partners, and pregnancy, but the relationship may not be causal.

*Involvement in problem or sensation-seeking behavior*

Engaging in problem or sensation-seeking behavior is related to poorer use of contraception, pregnancy, and childbearing. Problem or sensation-seeking behavior may expose teens to norms that favor sexual risk-taking or to more opportunity or desire to have unprotected sex. Alternatively, the relationship between problem behavior and sexual risk-taking may simply reflect family or community characteristics such as poverty, single-parent homes, lack of supervision, or a general propensity to take risks. Again, causality is not clear.

*Paid work*

Several studies have indicated that teens with paying jobs, especially those who work more than 20 hours per week, are more likely to have sex, to have sex more often, and to have more sexual partners. Paid work may increase teens' sense of independence, their mobility, and their opportunities to have sex.

*Involvement in sports*

A few studies have found that, for teen girls but not teen boys, participation in sports is related to delayed initiation of sex, less frequent sex, greater

use of contraception, and lower pregnancy rates. These studies suggest that girls' participation in sports motivates them to avoid pregnancy, which, in turn, delays initiation of sex. However, the relationship between participation in sports and lower rates of pregnancy is less clear. Perhaps it is because girls who are athletes are more likely than non-athletes to be young, better educated, and non-Hispanic white, characteristics that reduce their risk of becoming pregnant.

*Cognitive and personality traits*

Teens with higher cognitive development are less likely to have sex and more likely to use contraception if they do have sex. Teens with a greater internal locus of control—that is, who believe that they rather than external events control their lives—have sex less frequently, use condoms more frequently, and are less likely to become pregnant. Both of these factors may be causal.

Although high self-esteem and positive self-concept are commonly believed to be protective factors for sexual risk-taking, the picture is actually quite mixed. A few studies, including some with large samples that are representative of teens across the United States, have found that self-esteem and positive self-concept are protective factors against initiation of sex, use of contraception, and pregnancy. However, the large majority of studies has found that self-esteem and self-concept are not significantly related to sexual behavior. A few studies have found self-esteem to be protective only for girls or only for middle school (as opposed to high school) students. At least one study actually found that having sex can increase self-esteem. Thus, the relationships between these factors and sexual behavior are unclear and probably quite complex.

Teens who suffer from depression, thoughts of suicide, or fear of untimely death are more likely to have sex. Such emotional distress may affect their motivation to avoid pregnancy or STDs, diminish their ability to assess risk, or lead them to want to escape through sexual involvement. Alternatively, emotional distress may result from a negative environment, and that environment may actually cause the sexual risk-taking.

*Sexual beliefs, attitudes, skills, motivations, and intentions*

The strongest risk and protective factors are teens' own sexual beliefs, values, attitudes, skills, and intentions. Teens are more likely to have sex, to have sex more frequently and to have more partners, if they have permissive attitudes toward premarital sex. They are less likely to have sex if they have taken a virginity pledge.

Sexually active teens are more likely to use condoms or other forms of contraception if they believe that teen boys share responsibility for pregnancy prevention, that condoms do not reduce sexual pleasure, and that their partner will appreciate their using a condom. They are also more likely to use condoms or other forms of contraception if they have positive attitudes toward condoms and other forms of contraception, perceive more benefits and fewer costs and barriers to using condoms, have greater confidence in their ability to demand and use condoms or other forms of contraception, have greater motivation to use condoms or other forms of contraception to avoid pregnancy and STD/HIV, intend to use condoms, and actually carry condoms.

All of these beliefs, attitudes, skills, motivations, and intentions can be considered "sexual" factors and also "proximal" factors because they are closely linked conceptually and logically to a related sexual behavior and they influence that behavior directly. For example, values regarding sex are more closely related conceptually to actually having sex than is the proportion of the community that is foreign-born. The latter is considered "distal" and "nonsexual" because it influences sexual behavior indirectly.

While both common sense and research indicate that these proximal sexual factors have an impact on sexual behavior, it is also true that sexual behavior may very well affect these factors. For example, having sex and using condoms may affect attitudes about having sex, perceptions

of peer norms about sex, and perceived ability to use condoms. Thus, causality may operate in both directions.

Sexual risk and protective factors are particularly important for several reasons. First, they are well supported by a variety of social psychological theories, for example, social cognitive theory [2], theory of planned behavior [3], the information-motivation-behavioral skills model [4], and the health belief model [5]. Second, they are more closely related conceptually to a particular sexual and contraceptive behavior than are other factors. Third, they are more strongly related statistically to some types of sexual and contraceptive behavior than are most of the other factors. Finally, some of these factors form the theoretical basis for many sex and STD/HIV education programs that have reduced sexual risk-taking [6].

*Relationships with romantic partners and previous sexual behavior*

Not surprisingly, when teens begin dating frequently, go steady, and kiss and neck, they are more likely to have sex. These early romantic relationships may increase the desire, opportunity, and pressure to have sex. Furthermore, sex within a romantic relationship may be more consistent with teens' values and perceived norms than sex in casual relationships.

When the romantic partner of a teen is three or more years older, the teen is especially likely to have sex. The impact of this age gap is quite large, especially among middle school girls.

Teens who begin having sex at an earlier age are less likely to use contraception and more likely to become pregnant and/or to become a parent. They are also likely to accumulate a greater number of lifetime sexual partners and are less likely to use condoms. These behavioral factors contribute to a higher rate of STD. In addition, young girls are not fully physically mature and are more susceptible to STD.

The relationship between number of sexual partners and STD is especially well established. Many studies have demonstrated that having a large number of sexual partners greatly increases the chances of contracting an STD.

Several studies have shown that teens often use condoms initially in sexual relationships, but as their relationships continue and they have sex more frequently, they use long-term hormonal contraceptives such as oral contraceptives or Depo Provera instead.

Teens who discuss HIV and other STDs, methods of preventing infection, and their past sexual histories or risk are more likely to use condoms. Similarly, teens who discuss methods of preventing pregnancy are more likely to use contraception.

Not surprisingly, teens who previously used condoms or other contraceptives are more likely to use them on subsequent occasions. However, this finding may reflect other factors and may not be causal in itself.

Being married reduces the number of sexual partners and increases the chances of pregnancy. Because pregnancy can also lead to marriage, the direction of causality is not entirely clear.

Having been pregnant (or having gotten someone pregnant) increases both the risk that a young person will not use condoms during sex and, according to a few studies, the risk of another pregnancy. Causality regarding these factors is unclear, however, because a history of pregnancy undoubtedly entails some of the risk and protective factors discussed above, and these factors continue to increase the risk of pregnancy.

Prior sexual abuse is highly related to early initiation of sex, greater number of sexual partners, poor condom use, poor contraceptive use, pregnancy, and STD. However, there is some question about whether sexual abuse causes teens to then engage voluntarily in risky sexual behavior. Young people who have been sexually abused have undoubtedly also been exposed to a variety of other risk factors. In addition, the sexual abuse may distort their understanding of appropriate sexual and contraceptive behavior and may diminish

their ability to reject sex or to use contraception. Thus, it is not entirely clear whether it is exposure to other risk factors or sexual abuse itself that leads to greater voluntary sexual risk.

Sexual activity with persons of the same sex is another risk factor. Young people who engage in same-sex activity are more likely to have heterosexual sex and to have more sexual partners.

### Generalizability Across Different Subgroups of Teens

When developing programs for teens, communities and organizations are faced with the question of whether the risk and protective factors in Table 3-1 will apply to the group they are targeting. The best way of assessing the impact of these factors on any particular group of teens is to design and conduct research specifically for those teens. Typically, however, organizations do not have sufficient time or resources to undertake such research.

Fortunately, the factors presented in Table 3-1 are widely applicable. Virtually all of them were found to be statistically significant in at least two-thirds of the studies that measured their impact. (Statistical significance is a measure of how confident one can be in the results of a study.) The studies often sampled varied groups of young people, thereby increasing the chances that the factors will be significant in a range of communities. In addition, the studies demonstrated that most of the factors do have an impact on various subgroups of teens, especially teens in the three largest ethnic groups, and they often have an effect on teens of both sexes.

On the other hand, this is not always the case. For example, the following factors appear to be effective only for certain subgroups. Participating in sports appears to be a protective factor only for girls, having an older romantic partner is a stronger risk factor for girls than for boys, and communicating with parents about sex is a greater protective factor for girls than for boys. This short list does not imply that all other factors affect different racial/ethnic groups or genders equally. It simply means that multiple studies show that these three factors consistently have differential effects.

### Dominant Themes

The risk and protective factors that exert the strongest influence on teen sexual behavior operate in four general areas, some of which can be targeted by organizations that want to reduce teen pregnancy and the spread of STD/HIV:

- ☆ Individual biological factors (e.g., age, physical maturity, and gender)
- ☆ Disadvantage, disorganization, and dysfunction in the lives of the teens themselves and their environments (e.g., rates of substance abuse, violence, and divorce; also level of education).
- ☆ Sexual values, attitudes, norms, and modeled behavior (e.g., teens' own values about sexual behavior as well as those expressed by parents, peers, and romantic partners).
- ☆ Connection to adults and organizations that discourage sex, unprotected sex, or early childbearing (e.g., attachment to parents and other adults in their schools and places of worship).

## WHICH FACTORS CAN BE CHANGED?

The answer to this question depends to some degree on the organizations involved. Organizations concerned with preventing teen pregnancy, STD/HIV, or both encompass a wide range of activities, from STD/HIV education to family planning to youth development to parental education. Table 3-1 lists the risk and protective factors that show the strongest evidence of an impact on teen sexual behavior and specifies which factors can be most easily changed by different types of programs. Organizations can use the information in this table to guide them in choosing what factors they should focus on, given their goals, capabilities, and resources.

Table 3-1 rates the factors' amenability to change as follows: those that are impossible or extremely

difficult for most teen pregnancy and STD/HIV prevention organizations to change, although they may be able to do so by working with other agencies; those that are difficult for most organization to change unless they have special initiatives or capabilities (e.g., youth development activities or mental health services); and those that are most directly related to sexuality and reproductive health and thus most amenable to change by organizations targeting teen pregnancy and STD/HIV.

The only factors that, cannot be changed are biological. In addition, factors stemming from community disorganization cannot easily be changed by organizations that focus primarily on reproductive health, although sometimes collaboration with community or state agencies may bring about improvements. Other intractable factors relate to family structure, past events in the teen's life, and parents' sexual behavior. (Other agencies may be able to ameliorate some of the consequences of these factors, however.)

Some factors that cannot be easily changed by most pregnancy and STD/HIV prevention organizations can be changed with intensive youth development programs or other special services, including the following:

- ☆ Educational and counseling programs for parents that help them monitor their teens more appropriately, teach them to discourage their teens from having romantic involvements with much older partners, or urge them to emphasize to their teens the importance of doing well in school.
- ☆ Intensive counseling programs for families to improve the quality of family interactions, to increase communication, and to enhance connectedness generally.
- ☆ Intensive counseling programs for emotionally distressed teens that reduce stress, depression, or risk of suicide.
- ☆ Effective alcohol and drug abuse prevention programs for teens, parents, or both.
- ☆ Programs for parents about teen sexuality that help them communicate their values about sexual behavior and decision-making.
- ☆ Career education programs for teens that help them set—and pursue—educational and career goals.
- ☆ Tutoring programs that increase teens' attachment to school, improve their performance in school, and encourage them to pursue higher education.
- ☆ Intensive entrepreneurship programs that improve performance in school.
- ☆ Intensive arts and creative expression programs that increase performance in school and connectedness to school.
- ☆ Intensive service learning programs that bolster connectedness to school, improve school performance, and have other positive effects.
- ☆ Mentoring programs that increase attachment to parents, other adults and school, and decrease alcohol and drug use.
- ☆ Sports programs for girls that increase their participation in athletics.
- ☆ Other school-sponsored programs that encourage teens to become actively involved in school activities.
- ☆ Faith-based programs that encourage teens to be more involved in their faith communities and to learn the values of those communities, especially about sexuality.
- ☆ Comprehensive community-based programs that address multiple risk and protective factors.

Research has shown that most of these programs can affect risk and protective factors, but unless a program has certain important characteristics, it may not be effective [7]. In some of the examples above, particular program activities may be less important than involving young people actively and intensively in activities over a long period of time or forming close connections with adults.

The risk and protective factors that can be most easily changed by teen pregnancy and STD/HIV prevention programs are the sexual ones—that is, the sexual knowledge, values, perception of peer norms, motivation, and self-efficacy (confidence in their skills) of teens themselves, their partners, or their peers. Chapters 6 and 8 demonstrate that some sex and STD/HIV education programs, as well as other kinds of programs, can change these factors, thereby delaying the initiation of sex, reducing the frequency of sex, reducing the number of sexual partners, increasing condom or contraceptive use, or some combination of these outcomes. Logically, then, some of the programs also reduce rates of pregnancy and STD. Positive behavioral effects have been observed in a variety of program settings, including schools during regular school hours and on the weekends, community health centers, community detention centers, shelters for runaway youth, and residential drug treatment programs.

## IMPLICATIONS OF THESE FACTORS FOR PREGNANCY PREVENTION PROGRAMS

The following conclusions regarding risk and protective factors should be considered when designing and targeting pregnancy and STD/HIV prevention programs:

- ☆ On the one hand, most youth are at risk of unprotected sex and pregnancy. Given that about four-fifths of young people in the United States have sex while still in their teens, and given that many of them do not always use condoms and other forms of contraception consistently or effectively, pregnancy and STD are real risks in the lives of most teens. Thus, *all* teens need appropriate education about the value and benefits of delaying sex as well as accurate information about condoms and other forms of contraception. And all teens who become sexually active need access to reproductive health services.
- ☆ On the other hand, *some* teens are at much greater risk than others, and understanding the factors outlined here can help programs target high-risk teens with more intensive—and effective—interventions.
- ☆ Risk and protective factors should provide the basis for developing programs to prevent teen pregnancy and STD/HIV. Programs should focus on factors that are strongly and causally related to sexual risk-taking *and* that are amenable to change by the program. Table 3-1 lists factors meeting those conditions.
- ☆ Risk and protective factors should also provide the basis for identifying teens at greatest risk of unprotected sex. Some of the most important factors are readily measurable (gender, age, ethnicity, family income, school performance, and engagement in other risk-taking behavior) and can be used to identify teens most in need of help.
- ☆ The factors that influence teens' sexual behavior and decision-making are rooted in communities, families, schools, faith communities, friends and peers, romantic partners, as well as in teens themselves. Some of the factors also involve teens' relationships with these important individuals or organizations in their environment. Factors that increase the likelihood of teen pregnancy and STD/HIV are risk factors, whereas those that lower the likelihood are protective factors. Some factors influence sexual behavior directly, while others affect it indirectly.
- ☆ The majority of factors fall into one of four themes: biological factors such as age, physical maturity, and sex; disadvantage, disorganization, and dysfunction in the lives of teens and their families, peers, and communities; sexual values and norms expressed or modeled by teens themselves or by their families, romantic partners, peers, faith communities, schools, and communities; and teens' connection to groups or institutions that discourage risky sexual behavior, encourage responsible behavior, or both.
- ☆ Because so many factors affect teen sexual behavior, few individual factors have a large impact. Consequently, there is no simple, easy-to-implement prevention program—no

magic bullet—that will substantially change adolescent sexual behavior and lower pregnancy and STD/HIV rates. Few programs, after all, can modify more than a few risk or protective factors at a time.

☆ Because teens' sexual beliefs, attitudes, perceived norms, confidence in their abilities, intentions, and actual skills are more strongly related to their sexual and contraceptive behavior than most other, nonsexual factors, and because these sexual factors can be modified, prevention efforts should include sex and STD/HIV education programs as well as other interventions that address these factors. Given that teens' sexual beliefs, attitudes, and behavior are affected by their parents, siblings, and peers, prevention efforts should also encourage these groups to model appropriate sexual behavior, as well as encourage the media to present more responsible models of sexual behavior.

☆ Some nonsexual risk and protective factors are modestly related to pregnancy and STD, and some of them can also be modified. Interventions should address such factors.

☆ Because of the substantial variety among important risk and protective factors, organizations with diverse missions can help reduce the rates of teen pregnancy and STD. Organizations that traditionally focus on teen sex and reproductive health can most effectively address sexual factors, while those with broader missions can emphasize nonsexual factors.

☆ To reduce pregnancy and STD markedly, communities may have to address many risk and protective factors among different groups (e.g., teens, their families, schools, and communities), and they may have to address both sexual and nonsexual factors. In practice, this may mean that a patchwork of programs can be effective at the community level, if each addresses a specific set of factors that in the aggregate improve most of the important risk and protective factors.

☆ ☆ ☆

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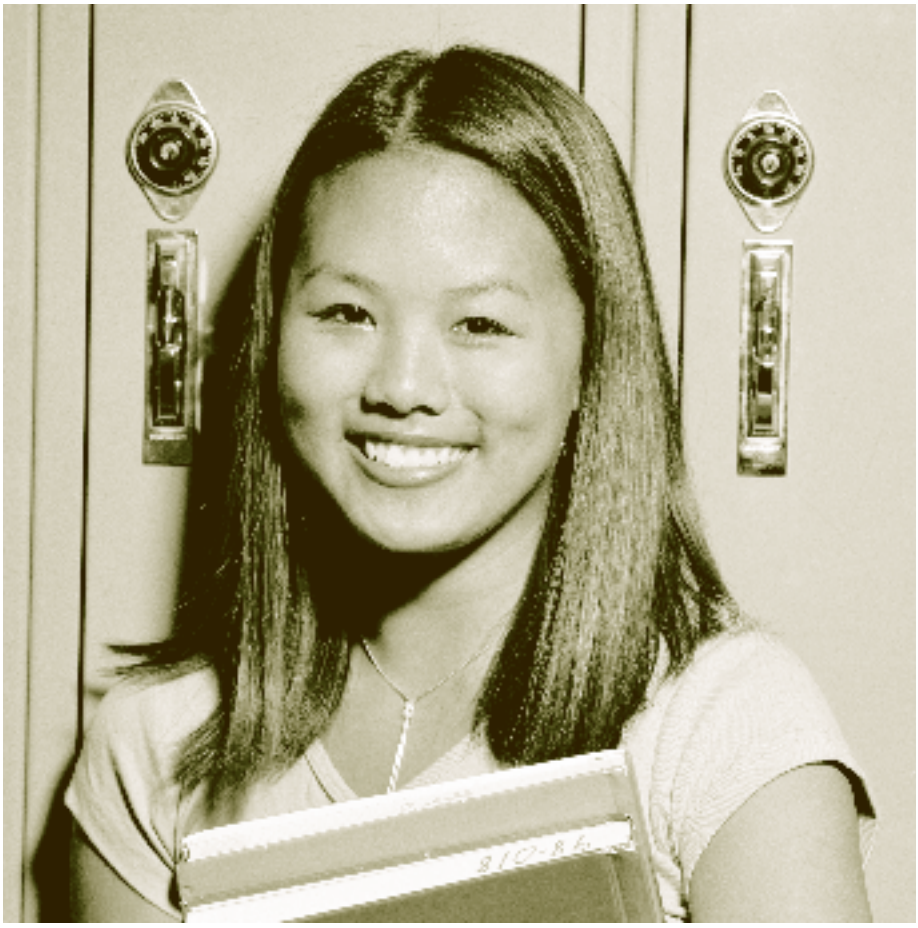

- ☆ This chapter describes the criteria used to select studies for review, the process of finding and reviewing the studies, and the basis for classifying the programs studied.
- ☆ To be included in this review, each study had to focus on middle school or high school–age adolescents, have a reasonably strong experimental or quasi-experimental design, have a sample size of at least 100, employ appropriate statistical analysis, and measure sexual behavior for sufficient periods of time.
- ☆ The studies are divided into three major groups, depending on the kind of programs they evaluate: those focusing primarily on sexual risk and protective factors (sex education and STD/HIV programs), those focusing on nonsexual factors (early childhood and youth development programs), and those focusing on both sexual and nonsexual factors (substance abuse, violence, and sexual risk programs).

CHAPTER FOUR

# Methods Used to Identify and Review Studies of Programs to Reduce Sexual Risk-Taking

After determining what types of behavior lead to teen pregnancy and STD/HIV and which risk and protective factors influence which types of behavior, the next task is to determine which preventive programs positively affect those risk and protective factors and behaviors. Numerous programs designed to prevent teen pregnancy and STD/HIV have been evaluated, so the first step is to assess which of those studies should be included in this review.

This chapter explains the criteria used to select studies and the process of finding and reviewing studies. It also describes how the various prevention programs were classified into groups. Results of the studies selected are presented in Chapters 6, 7, and 8.

## ESTABLISHING CRITERIA FOR INCLUSION

Except where noted, each study had to meet the following criteria:

☆ It had to evaluate a program that:

- Focuses on adolescents of middle school or high school age (roughly age 12 to 18) or parents of children up to age 18
- Does not focus on pregnant or parenting teens
- Has been implemented in the United States

☆ Its research methods had to:

- Include a reasonably strong experimental or quasi-experimental design, have reasonably well matched intervention and comparison groups, and collect data both before and after implementation of the program.
- Have a sample size of at least 100 persons.
- Measure program impact on teen sexual behavior (specifically, initiation of sex, frequency of sex, or number of sexual partners); use of condoms or contraception; composite measures of sexual risk (such as frequency of unprotected sex); pregnancy rates; birth rates; and STD rates.
- Measure impact on behavior that can change quickly (frequency of sex, number of sexual partners, use of condoms, use of contraception, or sexual risk-taking) for at least three months, or measure impact on behavior or outcomes that change less quickly (initiation of sex, pregnancy rates, or STD rates) for at least six months.
- Employ appropriate statistical analyses.

☆ The study must have been completed or published in 1990 or thereafter. (If only a few studies of a particular type of program were completed or published after 1990, then some studies published between 1980 and 1990 were included, especially as background.)

To be as inclusive as possible, publication in peer-reviewed journals was not a criterion.

## FINDING AND IDENTIFYING STUDIES THAT MET THE CRITERIA

Studies meeting these criteria were identified in several ways. Some were found by searching 10 databases (PubMed, PsychInfo, Popline,

Sociological Abstracts, Psychological Abstracts, Bireme, Dissertation Abstracts, ERIC, CHID, and Biologic Abstracts) through December 2004 and searching three of those databases (PubMed, PsychInfo, and Popline) through December 2005. Others were identified through reviews of past issues of 16 journals through December 2006; contacts with researchers at professional meetings and those in the process of completing studies; a review of reports, training materials, and process evaluation reports; and previous reviews of literature by various authors.

## ANALYSIS OF STUDY RESULTS

All identified studies that met the criteria were reviewed, and key data from each were included in a one-page summary that was sent to the original authors to obtain feedback and enhance accuracy. The summary specifies characteristics of the sample, characteristics of the program, research methods used, and effects on both sexual behavior and risk and protective factors (e.g., relevant knowledge and attitudes) [1]. All of the one-page summaries are available online at www.teenpregnancy.org/EA2007 or www.theNationalCampaign.org/EA2007. Because each of the effects of each study was coded, any study that measured multiple outcomes was counted multiple times.

Effects on behavior or on risk and protective factors were considered significant if they met each of two conditions. First, they were statistically significant at the $p<0.05$ level. (If the sample size was large enough, if many tests of significance were provided for outcomes, and if the authors chose the $p<0.01$ level because of these reasons, then effects were considered significant at the $p<0.01$ level.) Second, the significance level was based on either the total study population or a subgroup that comprised at least one-third of the study population, such as boys or girls, one of the three major racial/ethnic groups in the United States, and sexually experienced or inexperienced teens.

Some studies reported results for multiple measures of each behavior, for different time periods, for different subgroups, or for various combinations of the above. Such studies reported one or a very small number of positive effects on behavior, but the majority of their results were not significant. To avoid presenting only positive results and to provide a balanced overview of results, the following rules were adopted for summarizing results:

- ☆ Regarding *different measures of the same behavior*; all measures across all of the studies were ranked according to their probable impact on pregnancy or STD. For example, use of condoms over 12 months was ranked higher than condom use at first sex. Only the results from the highest ranked measure reported in each study were included in tables.
- ☆ Regarding *different time periods*, because very short-term effects on behavior would have had little impact on pregnancy or STD rates or on HIV prevalence, only results for three months or six months (depending on the behavior) or longer were included in tables.
- ☆ Regarding *different subgroups*, the results had to apply to roughly one-third of the sample or more.

The findings of the studies in this review and the characteristics of the programs they evaluated are presented in tables in Chapters 6 and 8. Conclusions about the impact of the programs are based on the original articles, the one-page summaries, and the tables in those chapters.

## CLASSIFICATION OF PREVENTIVE PROGRAMS

The search described above identified 115 studies that met the criteria for inclusion. It also identified studies that are discussed as background for some groups of programs or that did not quite meet the criteria for inclusion but are briefly noted in the text.

The programs evaluated in the 115 studies are found in schools; in health, family planning, and STD clinics; and in community organiza-

tions working with young people (including faith communities). Some are designed to support and encourage abstinence, some to improve knowledge, attitudes, and skills about condoms and other forms of contraception, some to improve access to condoms and other forms of contraception, and some to improve education, life skills, and life opportunities more generally. Some programs focus on preventing pregnancy, and others concentrate on STDs, particularly HIV. Some target adolescents, while others target the parents of adolescents or even younger children. Some focus on sexually inexperienced youth, others on the sexually experienced. Some use structured curricula for groups of teens, others provide one-on-one instruction or counseling, and still others use interactive videos or community-wide media. Some programs are implemented by adults; others are led by the peers of adolescents. Given all these important differences and dimensions, it is very difficult to categorize programs to prevent teen pregnancy and STD/HIV.

However, it is necessary to categorize programs in order to observe patterns of results within groups of relatively similar programs. The alternatives—summarizing all 115 studies individually or all 115 studies as a single group—is not practical and might obscure important characteristics of effective programs.

One useful way to categorize prevention programs is by the behavioral risk and protective factors they target (see Chapter 3). This review divides programs and their respective evaluations into three categories: those that focus primarily on *sexual* risk and protective factors affecting adolescent sexual behavior and condom or contraceptive use, those that focus primarily on *nonsexual* risk and protective factors, and those that focus on both. Within these three broad categories, programs can be divided into 11 major groups and several subgroups (see Box 4-1).

Of the 115 studies selected for this review, 56 measured the impact of curriculum-based sex and STD/HIV education programs and 59 measured the impact of other types of programs. Important methodological characteristics of all of the studies are discussed in Chapter 5, and the results of the studies are summarized in Chapters 6, 7, and 8.

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### Box 4-1: Classification of Pregnancy and STD/HIV Prevention Programs and Location of Reviews

| Programs That Focus Primarily on Sexual Risk and Protective Factors | Chapter | Table |
|---|---|---|
| **Curriculum-based sex education programs in any setting** | 6 | 6-2, 6-3 |
| · Abstinence education programs | 6 | 6-2 |
| · Sex and STD/HIV education programs | 6 | 6-2 |
| Sex and STD/HIV education programs for parents and their teens | 8 | 8-1 |
| Stand-alone video- and computer-based programs | 8 | 8-2 |
| **Clinic-based programs designed to provide reproductive health care or to improve access to condoms or other contraceptives** | | |
| · Family planning services | 8 | |
| · Protocols for clinic appointments and supportive activities | 8 | 8-3 |
| · Advance provision of emergency contraception | 8 | 8-3 |
| · Other clinic characteristics and programs | 8 | 8-3 |
| **School-based health centers, school-linked reproductive health clinics, and school condom availability programs** | | |
| · School-based health centers and school-linked reproductive health clinics | 8 | 8-4 |
| · School condom-availability programs | 8 | 8-4 |
| Community-wide pregnancy or STD/HIV prevention initiatives with multiple components | 8 | 8-5 |
| **Programs That Focus Primarily on Nonsexual Factors** | | |
| Welfare reform for adults | 8 | 8-6 |
| Early childhood development programs | 8 | 8-6 |
| **Youth development programs for adolescents** | | |
| · Service learning programs | 8 | 8-7 |
| · Vocational education and employment programs | 8 | 8-7 |
| · Other youth development programs | 8 | 8-7 |
| **Programs That Focus on Both Sexual and Nonsexual Factors** | | |
| Programs that address substance abuse, violence, and sexual risk-taking | 8 | 8-8 |
| **Multi-component programs that focus primarily on sexual risk-taking but include sexuality and youth development components** | | |
| · Abstinence-until-marriage programs | 8 | 8-9 |
| · Client-centered programs | 8 | 8-9 |
| · Programs for sisters of pregnant teenagers | 8 | 8-9 |
| · Very intensive, long-term programs | 8 | 8-9 |

1 2 3 4 5 6 7 8 9 10

☆ Evidence of programs' effects on teen sexual behavior is only as strong as the research methods used to evaluate those programs. Fourteen criteria were used to judge the research methods used by the studies in this review and the strength of the evidence they produced:

1. Use of experimental or quasi-experimental designs versus analyses of data obtained without such designs
2. Use of random assignment of individual teens or groups of teens (such as classrooms or schools)—experimental versus quasi-experimental designs
3. Sample size—number of individual teens in the study
4. Number of clusters of teens or geographic areas assigned to intervention or comparison groups
5. Long-term follow-up
6. Attrition and response rates
7. Measurement of pregnancy and STD
8. Measurement of behavior
9. Measurement of factors affecting sexual behavior
10. Correct statistical analyses
11. Publication of results
12. Replication of studies
13. Independent external evaluators
14. Sampling of programs

For many of these criteria, this chapter assesses the methods used in the studies and estimates their impact on overall results.

☆ Many of the studies were found to be underpowered—that is, their samples sizes were too small to have a reasonable chance of finding statistically significant actual program effects that were programmatically meaningful. Other biases might have led to positive results by chance. Thus, some biases tended to cancel each other out.

☆ Given the inherent limitations of program evaluations, coupled with possible biases, definitive statements about specific programs or types of programs should be made cautiously.

☆ The quality of the study design and of the resulting evidence should be given considerable weight when assessing results and when selecting programs for replication.

☆ Despite these limitations, considerable progress has been made over the years in the quality of research methods used to evaluate programs.

# Assessing the Strength of the Evidence

The only good way to gauge the strength of the evidence regarding the effects of programs on behavior is by examining the research methods used to evaluate the programs. The quality of methods used to evaluate the impact of programs varies greatly. Some studies produce very strong evidence that programs have or do not have a causal impact on sexual behavior; other studies do not. Accordingly, the quality of the research methods and the strength of the evidence should be thoughtfully considered when assessing the results of studies. Results that come from well-designed studies should generally be taken more seriously than results from poorly designed ones.

This chapter discusses 14 criteria for judging the quality of the research methods and the strength of evidence from evaluation studies. The criteria are based in part on established guidelines for rigorous research [e.g., the CONSORT guidelines [1; 2]] and in part on experience reviewing more than 100 studies.

In addition, the chapter estimates the extent to which the research studies in this review meet each criterion and, if appropriate, how failure to meet that criterion could bias the results. For specific information about the research methods used in each study and possible important limitations of each study, see the one-page summaries of each study [3]. They are available at www.teenpregnancy.org/EA2007 or www.theNationalCampaign.org/EA2007.

## CRITERIA FOR ASSESSING RESEARCH METHODS

### 1. Use of Experimental or Quasi-Experimental Designs versus Analyses of National Survey Data or Other Data Obtained without Such Designs

Studies employing experimental or quasi-experimental designs typically compare an experimental, or intervention group, which receives the instruction or services provided by the program being analyzed, with a control, or comparison group, which does not. Data are collected from persons in each group before and after the program. Usually, studies link the data collected from each person before and after the program and then analyze the change over time in the behavior of the intervention group and compare it with the change over time in the comparison group. Most studies strive to make their intervention and comparison groups as similar as possible. Studies with an experimental design accomplish this by assigning participants to the intervention or comparison group at random. Studies with quasi-experimental designs do *not* assign participants to one or the other group at random, but they do compare the study group with a comparison group made up of purportedly similar people.

Studies that employ experimental or quasi-experimental designs are very different from studies based on national surveys of young people or on census tract-, county-, or state-level data. Studies based on national surveys generally depend upon the respondents' recall

of whether they ever participated in a particular type of program. They also have very poor measures of the quality of any programs in which the participants were involved and may have considerable difficulty controlling statistically for other factors that might produce spurious statistical relationships or obscure actual ones. Similarly, studies based on data aggregated at the census tract, county, or state level also have poor measures of participation in various programs, have difficulty controlling for other factors that may affect relationships, and sometimes have very small sample sizes (e.g., studies of the 50 states).

Studies with an experimental or quasi-experimental design have at least three important strengths not typically found in studies using national survey or aggregated data. First, they evaluate specific programs with known characteristics. Second, they can clearly distinguish between who did and did not participate in the program being studied (or at least those in the intervention and comparison groups). Third, they typically control for other factors that may have affected the results, such as self-selection. Thus, experimental or quasi-experimental studies have greater potential to assess the causal effects of specific programs than studies based on surveys or aggregated data.

Because of these strengths, this review includes only studies with a good experimental or quasi-experimental design. Studies based on national surveys or on census tract, county, or state data are occasionally mentioned as background material but are not included in any of the summary tables.

In nearly all of the studies, the comparison group received other instruction or services rather than nothing at all. In some studies, the comparison group received the standard sex education course for that institution instead of the new or experimental program. In others, young people who did not receive subsidized family planning services from a clinic did receive such services from a private physician or obtained nonprescription contraceptives from a drugstore.

Nearly all young people, including those in both the intervention and the comparison groups, are exposed to information about sexuality in other classes in school, from the media, or from their parents or peers. Therefore, the studies in this review typically measure only the *incremental* effect of a program, not the cumulative effect of the program plus whatever sex education or reproductive health services the teen might have received elsewhere. If the cumulative effect of all education and services were measured, results would undoubtedly be stronger.

### 2. Use of Random Assignment—Experimental versus Quasi-Experimental Designs

The studies that demonstrate causality most conclusively use an experimental design and assign individuals or groups at random to an intervention or comparison group. Random assignment is particularly important because people who voluntarily participate in programs (that is, who self-select) are typically different in subtle or not-so-subtle ways from those who do not. Those differences produce selection bias. For example, teens who voluntarily participate in an abstinence program may be more inclined to be abstinent than their peers, and those who visit a health center for contraception may already be more motivated to use contraception than other sexually experienced teens. Therefore, teens who do not voluntarily participate in an abstinence program may be a biased comparison group for those who do volunteer, and sexually active teens who do not attend a family planning clinic may be a biased comparison group for those who do attend. Selection bias can occur even when participation is not determined primarily by the teens or their parents. For example, school-wide and community-wide programs are disproportionately likely to be implemented where the need is greatest—that is, where a greater proportion of teens are involved in sexual risk-taking.

Of the 115 studies included in this review, 70 had an experimental design, while the remaining 45 had a good quasi-experimental design. In other words, results from less than one-half of

the studies may have been affected by self-selection or other kinds of bias. In theory, such biases could either obscure actual positive program effects or erroneously suggest positive effects that did not occur.

Possible biases produced by lack of random assignment should not have affected major conclusions of the studies in this review for at least four reasons: more than half the studies used experimental designs; studies with the weakest quasi-experimental designs were excluded; most important conclusions were confirmed by one or more studies with experimental designs; and results of studies with experimental and quasi-experimental designs were generally very similar. Consequently, the inclusion of studies with a quasi-experimental design probably does not skew the conclusions of this review markedly in one direction or the other. Nonetheless, when organizations select specific programs to implement, they should give greater consideration to programs found to be effective by studies with a strong experimental design.

### 3. Sample Size—Number of Individual Teens Assigned to Groups

Rigorous studies need to include a sufficiently large sample, or number of individual participants. The sample size needed depends on several factors, such as variability in the outcome measure, magnitude of the effect to be detected, and chosen level of statistical significance. However, a growing body of experience suggests that a combined sample of at least 600 or even 1,000 individuals is usually needed to measure impact on sexual behavior of young people.

Much larger samples may be needed if groups (e.g., classrooms or entire schools) rather than individuals are assigned to study or comparison groups, if the program has a very modest effect, if some subgroups of the sample need to be examined separately, or if highly skewed variables with very asymmetrical distributions (e.g., teen pregnancy or birth rates) are being measured.

Large samples are necessary for at least three reasons. First, and most important, if the sample size is too small, a program may produce important actual effects (programmatically meaningful effects), but those effects may not be statistically significant. Second, when sample sizes are small, the *magnitude* of an effect cannot be accurately estimated because much of the effect could have been caused by chance (in statistical terms, the confidence intervals for the estimates are large). Third, when sample sizes are small and researchers conduct and review many tests of significance, then anomalous, unexpected, and inconsistent results are more likely to occur.

Only 50 percent of the studies had a sample size of at least 600 when data were collected initially (at the baseline) and at the three- or six-month follow-up, and 47 percent had a sample size of at least 600 at their last follow-up (six months or more). This indicates that at least half of the studies were statistically underpowered.

The problem of insufficient statistical power was further aggravated by the fact that studies typically divided their samples into sexually inexperienced teens at baseline (in order to measure initiation of sex) and sexually experienced teens at follow-up (to measure impact on condom and contraceptive use among those who did have sex). Some studies further divided their samples by gender because results sometimes differed by gender.

If a sample is divided into those who had not initiated sex and those who later did have sex, and if 600 teens per group are needed, then the initial sample must be at least 1,200 teens. Researchers typically do not know ahead of time how many study participants will have had sex and how many will not have had sex, so these two groups are not likely to be of equal size, requiring a sample considerably larger than 1,200. Finally, if analyses are conducted separately for males or females or other groups, the needed sample may double or more than double in size.

Only 32 percent of the studies had a sample size of at least 1,200 when data were collected at the

baseline and at the three- to six-month follow-up, and only 24 percent had at least 1,200 for baseline and last follow-up surveys. These percentages indicate that three-fourths or more of the samples were too small and that the resulting statistical analyses were underpowered.

Because a large majority of the studies were underpowered, some of the programs they evaluated may have had programmatically important results that were not found to be statistically significant, thereby producing a conservative bias. This bias is probably quite large. In addition, the magnitude of program effects cannot be estimated accurately, and some anomalous and inconsistent results probably occurred. Thus, when reviewing findings, it is important to observe patterns of results and not to place too much emphasis on surprising, inconsistent, or anomalous results.

### 4. Number of Clusters of Teens or Geographic Areas Assigned to Intervention or Comparison Groups

Sometimes groups, or clusters, of teens (e.g., classrooms, schools, agencies serving young people, communities, cities, or other geographic areas) are assigned to the intervention or comparison groups. In such cases, the number of clusters, in addition to the number of individual teens in the sample, can be very important.

The following hypothetical example illustrates the importance of the number of clusters. Suppose a research team wanted to measure the impact of a new program on sexual behavior and randomly assigned four schools to intervention and comparison groups. Also suppose that three of the schools were mainstream schools with average students and one was an alternative school with many students at high risk of engaging in unprotected sex. Even though the four schools in combination might contain a very large number of students, the fact that one of them is quite different from the other three means that, regardless of how the random assignment ends up, the intervention and comparison groups will be very different. Whichever group is assigned the alternative school will end up having a much greater proportion of teens engaging in unprotected sex. It might also have a much larger percentage that initiates sex or has more sexual partners or uses condoms less frequently. The large inherent differences between the intervention and comparison groups are likely to skew subsequent statistical analyses that compare the change over time in the two groups of schools.

Even more dramatically, if a program is implemented in one city and a similar city is used as a comparison group, and if teens in the first city change more positively over time than teens in the second city, it cannot be known with certainty whether the program produced the positive effect or one of the myriad of other differences between the two cities produced the positive effect. The two cities may have differences in values about sex, differences in peer norms about engaging in sex at different ages, differences in actual patterns of sexual behavior, differences in other programs, or differences in such social factors as the quality of schools, employment, and income.

If as many as 18 to 20 schools or other clusters are carefully assigned to intervention and comparison groups, then the two groups are likely to be fairly similar. However, if only four to six clusters are assigned, then the two groups are much more likely to be different. And, finally, if only two clusters are assigned—as is the case when one geographic area is compared with another—then the two groups may be quite different in a large number of unknown and unmeasured ways.

The number of schools, cities, or other clusters needed to ensure that the intervention and comparison groups are similar depends in part on the variation among clusters. If all of the clusters assigned at random are very similar on all of the characteristics and types of behavior being studied, then fewer clusters may be needed to produce similar intervention and comparison groups.

In sum, if the number of clusters is small, then reviewers should be especially cautious about

attributing differences in outcomes to the program; if the number is closer to 20 or more, then reviewers may have greater confidence in attributing differences to the program.

Of the 115 studies in this review, 60 assigned individual teens to study and comparison groups. Of the remaining 55 studies, 13 assigned four or fewer clusters; 19 assigned five to 17 clusters; and 23 assigned 18 or more clusters of young people. Results from the studies with few clusters should be viewed especially cautiously.

Because assigning clusters of teens to study and comparison groups is different from assigning individual teens, clustering must be accounted for properly in the statistical analyses. Failure to do so may cause results to appear significant when in fact they are not [2]. Of the 55 studies that assigned clusters of teens, 20 adjusted appropriately for clustering, and 35 failed to do so. In other words, almost one-third of the studies in this review are biased in favor of more significant results because they did not adjust statistically for clustering.

### 5. Long-Term Follow-Up

Studies measuring the impact of programs need to conduct long-term follow-up surveys with participants. The desired length of time between initial data collection and follow-up varies with the characteristics of the study, such as outcomes being measured, length of time before outcomes can become apparent, length of time outcomes are likely to endure, and sample size. Experience in this field suggests that follow-up for at least one year is important, but a shorter period can provide useful information about short-term effects [2].

Long-term follow-up can detect effects that are not apparent in shorter periods of time. This is particularly true of studies that measure the impact of programs to delay initiation of intercourse. If young people are tracked for much less than 12 to 18 months, too few of them in most comparison groups will have initiated sex to allow a distinction to be drawn between them and the intervention group. A program may actually delay sex in the long run, but that effect could not be observed because too few young people in the comparison group initiated sex in the short follow-up period.

Some program effects (e.g., increase in participants' knowledge) are likely to diminish substantially with time, so positive short-term results may be misleading. If short-term results do not endure, they may have only a very limited impact on the goals of reducing adolescent pregnancy and STD rates over a longer period of time.

As stated in Chapter 3, all studies in this review must measure a program's impact on sexual behavior that can be changed quickly (frequency of sex, number of sexual partners, use of condoms, use of contraception, or sexual risk-taking) for at least three months or measure its impact on behavior or outcomes that change less quickly (initiation of sex, pregnancy rates, or STD rates) for at least six months. A few published studies that attempted to measure impact on initiation of sex did not measure behavior long enough and may therefore have concluded, incorrectly, that programs were not effective. Those studies are not included here.

A large majority of the studies that were included in this review measured long-term effects. Specifically, 83 of the 115 studies measured impact for one year or more, 40 measured impact for two years or more, and 26 measured impact for three years or more.

### 6. Rates of Retention and Attrition

Program impact can only be measured if participants remain in a study through the follow-up period. If many study participants who completed the baseline survey fail to complete follow-up surveys, the overall results become less credible. The percentage of the baseline sample that completes a follow-up survey is called the retention rate, or the follow-up response rate, while the percentage of the baseline sample that drops out of the study is called the attrition rate.

Two errors or limitations may be introduced through low retention and high attrition rates. First, teens who drop out of a study are likely to be different from those who remain in the study. Often, they are more mobile or engage in more risky behavior. This limits the ability to generalize from the original sample to larger, similar populations.

Second, teens in the intervention group may become involved in some aspect of the program and therefore be less likely to drop out of the study than teens in the comparison group. Such unequal attrition rates may introduce an additional bias [2]. For example, if the high-risk teens in the comparison group of a study drop out and the high-risk teens in the intervention group stay in and complete the follow-up surveys, the remaining members of the comparison group may report less risky behavior than the remaining members of the intervention group, which now includes more high-risk teens. In this case, the differential attrition might obscure a positive program impact. Other examples might produce the opposite effect.

In general, retention rates of at least 80 percent are desirable. Retention rates of 70 to 79 percent are considered acceptable, but they may subject the study to sample biases. Studies with retention rates between 60 and 69 percent are sometimes reviewed [4], but they are less credible. If retention rates are below 60 percent, the results are generally considered not credible.

Eighty-nine studies reported retention rates from baseline to follow-up. Fifty-six (62 percent) had a retention rate of at least 80 percent; 18 (20 percent) had a retention rate of 70 to 79 percent; 7 (8 percent) had a retention rate of 60-69 percent and 9 (10 percent) had a retention rate below 60 percent. Surprisingly, longer-term retention rates were just as high as shorter-term retention rates. This means that the strength of the evidence from a significant portion of the studies suffered from attrition, but that attrition should not bias overall conclusions markedly.

### 7. Measurement of Pregnancy and STD

The most logical way to measure outcomes of a program designed to reduce teen pregnancy and STD would be to determine changes in the rates of pregnancy and STD. This is especially true given that the associations between sexual or contraceptive behavior and the rates of pregnancy or STD are far from perfect. That is, one or more sexual or contraceptive behaviors may improve without any appreciable change in pregnancy or STD rates.

At least two important methodological problems stand in the way of using pregnancy and STD rates as outcome measures. First, regardless of how they are measured, pregnancy and STD rates are a very insensitive measure of program impact. If a program reduces the annual teen pregnancy rate by 20 percent, from 100 pregnancies per 1,000 persons to 80 per 1,000, the program would be very successful. However, that decrease represents a difference of only 20 pregnancies per 1,000 (or 2 percentage points), so a very large sample size (more than 6,000) would be required to have a strong chance of finding that change to be statistically significant. The same problem applies to an even greater extent to birth rates, and it applies to STD rates whenever those rates are low in a population.

Second, pregnancy and STD rates are often hard to measure and may therefore be inaccurate. Laboratory tests are the most rigorous method, but they can be difficult to administer in some settings, they are expensive, and they only measure pregnancy and STD at the time the test is given. Pregnancies or STD infections during previous months would not be detected.

If pregnancy and STD rates are estimated from self-reported data, they are likely to be under-reported [5; 6]. This is especially true for boys, who may not know of pregnancies they have caused, and for girls who have ended their pregnancies by abortion and are reluctant to report them. It is especially true of STD rates because many young people have an STD but do not know they do.

Vital records (e.g., birth records) can sometimes be used to estimate birth rates or STD rates. A few studies have matched the names of individual study participants with confidential birth records and thereby estimated birth rates, but such studies are unusual. More commonly, birth rates are only available for political units such as cities or health districts and not for the particular study participants in the intervention and control groups. Furthermore, while birth rates among study participants can sometimes be determined from birth certificates, public records rarely yield abortion rates, which are needed to estimate pregnancy rates.

Thirty-five of the studies in this review measured program impact on pregnancy rates, seven of them by conducting pregnancy tests. Twenty studies measured program impact on birth rates, four of them by using public records to measure pregnancy. Finally, 23 studies measured program impact on STD rates, five of them by using STD tests. Overall, about one-fifth of the studies that measured impact on pregnancy, childbearing, or STD rates used laboratory tests to obtain those rates.

Of the 52 studies that measured impact on pregnancy, birth, or STD rates, nine (17 percent), had a sample size of 2,000 or more at either first or last follow-up. Thus, most studies lacked statistical power and conducted analyses of pregnancy, birth, or STD rates based on insufficient sample sizes; therefore, their results are strongly biased in favor of nonsignificant results.

### 8. Measurement of Behavior

Because of measurement limitations inherent in pregnancy, birth, and STD rates, other measures of behavioral change are most commonly used. As discussed in Chapter 2, the single most important factor affecting pregnancy is the frequency of unprotected sexual activity, and the most important factors affecting STD rates are frequency of sex not protected by condoms and the number of sexual partners not consistently protected by condoms. Accordingly, these measures and their constituent components are often used to measure the impact of programs. For pregnancy prevention programs, frequently used measures include age at initiation of intercourse, frequency of intercourse, use of contraception (at first sex, at last sex, or consistency of use), and frequency of sex without contraception. For STD prevention programs, frequently used measures include age at initiation of intercourse, frequency of intercourse, number of sexual partners, use of condoms (at first sex, at last sex, or consistency of use), frequency of sex without condoms, and number of partners not always protected by condoms.

As noted in Chapter 4, studies included in this review measure program impact on sexual behavior (initiation of sex, frequency of sex, and number of sexual partners); use of condoms or contraception more generally; composite measures of sexual risk (e.g., frequency of unprotected sex); pregnancy rates; birth rates; and STD rates. All but 14 of the studies measured impact on sexual behavior, not just pregnancy, birth, or STD rates.

Behavior can only be estimated from data that individuals report about themselves. Although some under- and overreporting of behavior undoubtedly exists, these data are generally believed to be reasonably reliable and valid. Furthermore, when under- or overreporting occurs, these biases are believed to cancel each other out in good experimental designs [7].

On the other hand, underreporting of sexual risk-taking by intervention and comparison groups may not always cancel each other out. Such bias is most likely to occur when study participants become close to program staff, when program staff administer the surveys themselves, and when large incentives are provided to complete the surveys. To the extent that it occurs, underreporting bias would probably be greater in intervention groups and would favor more desirable program results.

### 9. Measurement of Factors Affecting Sexual Behavior

Given the goal of reducing adolescent pregnancy or STD, studies should measure actual sexual and contraceptive behavior or pregnancy or STD rates, rather than only the risk and protective factors directly affecting those behaviors, such as *intent* to have sex or *intent* to use contraception [2]. This is particularly important because adolescents' sexual beliefs, attitudes, and even intentions are only *moderately* (not highly) related to their actual behavior, which makes them poor proxies for actual behavior. For example, many adolescents intend to abstain from sex, but have sex anyway, or intend to use contraception every time they have sex, but do not actually do so.

Despite this caveat, measures of risk and protective factors can play at least two important roles in evaluations of program impact. First, if a study's results demonstrate an impact on both sexual behavior and the risk and protective factors targeted by the program, the evidence is stronger that the program actually had an impact than if the results had demonstrated an impact on behavior only. Second, the program's impact on risk and protective factors can help explain how or why the impact on behavior occurred. Thus, measurement of potentially important risk and protective factors is needed to advance research on program impact.

Many studies have examined program impact on the risk and protective factors directly affecting sexual behavior rather than measuring program impact on behavior itself. Although such studies can inform the development of programs, they are not included in this review for the reasons given above.

All but 14 of the studies in this review reported potentially important risk and protective factors in addition to behavior. Those 14 studies that did not report impact on risk and protective factors either measured effects on risk and protective factors but failed to report them, or focused on programs (such as child development or youth development) that were designed primarily for other purposes and only incidentally measured impact on sexual behavior, pregnancy, or childbearing years later.

### 10. Appropriate Statistical Analyses

To obtain accurate results and draw valid conclusions from them, researchers must conduct appropriate statistical analyses of the data they collect. They should, for example, state precisely the hypotheses to be tested before conducting the tests of significance, conduct the appropriate statistical tests of significance, correct for clustering if respondents are randomly assigned in clusters instead of individually, take into account the issues raised by multiple tests of significance, especially when numerous tests are conducted, and then report the results of all tests of hypotheses, whether those results are positive or negative [2].

If a study contained egregious errors in its statistical analysis, then it was not likely to have been published or included in this review. That said, it was difficult to assess how rigorously all statistical analyses were completed, because descriptions of the analyses varied considerably. For example, assessing how precisely some researchers stated their hypotheses before conducting analyses could be difficult. On the other hand, with the exception of failure to adjust for clustering, all of the studies appeared to conduct appropriate statistical tests.

As noted above, 35 of the 55 studies that involved clusters of young people, did not adjust for clustering. Results reported as statistically significant, therefore, *might* not have been significant if the analyses had adjusted for clustering. Failure to adjust for clustering creates a bias in favor of more significant results.

Ninety-nine of the 115 studies conducted multiple tests of significance, but only seven studies adjusted for them. Given the coding procedures used in this review, failure to adjust for multiple tests would produce a bias in favor of more significant results, but it would not bias results in a positive or negative direction.

It is not possible to correct for most of the limitations mentioned above without conducting a formal statistical meta-analysis of the studies. However, it is possible to adjust partially for multiple tests of significance. Across all studies, 924 tests of significance for sexual behavior were conducted (an average of eight per study). By chance alone, 5 percent of those tests (46) would be significant, and of that 5 percent, half (23) would be significant in the positive direction and half (23) in the negative direction. Chapters 6 and 8 report on 198 positive significant findings, 13 negative significant findings, and 713 nonsignificant findings. The number of positive significant findings (198) far exceeds the number that would be expected by chance (23), and the number of negative significant findings (13) is less than would be expected by chance. Thus, roughly 23 of the 198 positive significant findings (or roughly 12 percent) may have occurred by chance, but the rest should not have occurred by chance, other factors being equal. The result is a small bias in favor of desirable program effects, but the bias would not affect overall conclusions.

### 11. Publication of Results

If evaluation studies are conducted well, researchers should attempt to publish all the important results, regardless of whether they are positive or negative. Otherwise, the published literature becomes very biased. Consider the following example: if 16 studies meeting the criteria above are published each year, and if each of them examines five different behavioral outcomes for each of two subgroups (e.g., boys and girls), then 160 tests of significance will have been examined. By chance alone, 5 percent of the outcomes (or eight per year) would be statistically significant at the .05 level, and half of those eight outcomes would be in the desired direction by chance alone. In just five years, 20 outcomes will have been found to be significant in the desired direction by chance alone. If *only* those studies are published, then the literature would obviously become very biased in favor of the programs they describe, even though the positive results may occur solely by chance.

In sum, the large number of studies being conducted at any given point, the large number of outcomes examined, chance, and the natural tendency to publish only positive results may markedly bias published conclusions about program effects in a positive direction. To counter this bias somewhat, emphasis should be placed on results from studies that are large, well-funded, and well-designed, that have advisory boards with experts in the field who will insist on releasing negative results, and that are widely known while in progress (because such studies are more likely to release results regardless of whether they are positive or negative).

This review requires that studies meet various programmatic and methodological criteria, but it does not require them to have been published. In fact, it attempted to identify and obtain studies that have not been published, and it succeeded in obtaining several. Nevertheless, an unknown number of studies undoubtedly could not be identified. Their omission probably biases overall results in favor of desirable program outcomes.

### 12. Replication of Studies

A program found to have positive results in one study should be replicated by other people in other settings and reevaluated in order to learn more about its true impact [2]. Factors unique to that particular implementation of the program may be responsible for the positive results—for instance, the teacher(s) may have been particularly charismatic, the program may have met the particular needs of that specific group of teens, the program might have been reinforced by other programs in the community, or the results might have occurred by chance. When implemented in another setting without those factors present, the results may not be so positive.

Four programs in this review were replicated and evaluated in more than one site. Three of the programs showed the same results in one or more subsequent studies, while the remaining program, which had weaker results to begin with, did not (see Chapter 6).

Organizations selecting a program to implement should give special consideration to programs that have been replicated and found to be effective by more than one study (see Chapter 10, Table 10.1). This does not mean that organizations should select *only* programs that have been successfully replicated—such a practice would unnecessarily limit their choices. Many other considerations should also affect choice of programs, such as resources available and the fit between the program and the needs of the particular teens being targeted.

### 13. Independent External Evaluators

Ideally, evaluations of impact should be conducted by parties who do not have a direct stake in the results of the evaluation, or independent evaluators should be part of the research team or its advisory board. People who evaluate their own programs are not dishonest, but they often believe strongly in the efficacy of their programs and may spend greater effort searching for elusive positive effects than for elusive negative effects, resulting in biased reports. This cautionary note is supported by the literature on experimenter effects, which underscores the need for independent evaluations.

On the other hand, nearly all researchers are honest and follow recommended design and statistical practices. Moreover, most studies are published, which means they went through a rigorous review process. Also, some studies have advisory boards that review progress and results on an ongoing basis. All of these factors diminish investigator bias.

Many of the studies reviewed here were conducted by people who helped design the programs and who undoubtedly had a personal interest in the outcome. This may have biased the results somewhat in a positive direction. Fortunately, many of the studies, particularly the larger ones, included advisory boards and were published.

### 14. Sampling of Programs

To be confident that findings from studies of somewhat similar programs can be generalized to other programs of the same type, the programs studied must be a representative sample of the larger group of programs [2]. For example, evaluations of several sex education programs that use particular strategies for changing behavior probably cannot be used to assess the impact of sex education programs that take very different approaches.

So many different approaches to reducing teens' sexual risk-taking can be taken that even the 115 studies included in this review do not represent all of them. Those 115 studies fall logically into 21 types or subtypes of programs. While that is a large number of studies representing many types of programs, there may be other types of programs that have not even been evaluated yet. For example, no studies have examined the impact of web sites about sexuality for young people or messages and information intentionally included in television programs, even though such approaches may reach millions of young people.

More importantly, only a few studies have evaluated some of the 21 types or subtypes of programs. For example, only two studies have evaluated the impact of interactive, computer-based programs, five studies have evaluated school-based clinics, one study has assessed an early childhood development program, four studies have examined service learning programs, and so on.

The type of program most commonly evaluated is curriculum-based sex and STD/HIV education. More than 55 studies have evaluated the impact of such programs. Although Chapters 6 and 7 demonstrate that some of them change behavior and that effective programs commonly include certain characteristics, the 55 studies do not constitute a representative sample of all curriculum-based programs in the United States, and thus one cannot generalize from them to all curriculum-based programs currently being implemented. The difficulty of generalizing results is

heightened by the fact that some programs may work in some settings with some young people but not in other settings. Additional studies are often needed to learn about the effects of programs across different groups of young people.

Furthermore, the programs that are evaluated, especially those in large, well-funded projects, are more likely than other programs to have well-trained staff, to have been well and carefully run, and to focus on specific outcomes. Thus, evaluations of such programs are likely to overstate the positive results that might emerge when the same programs are adopted and implemented in other settings by other organizations. This potential bias may have been offset in three ways: some programs may have been evaluated prematurely (before formative evaluations have led to program improvements), some programs may not have been implemented with fidelity at the time they were evaluated, and many studies are evaluated with inadequate sample sizes.

In sum, one must be very cautious when drawing inferences about types of programs with only a few existing studies, and one must be cautious about generalizing from programs that have been evaluated to programs currently being implemented.

### Practical Considerations

Conducting studies that meet most of these methodological criteria requires considerable time and resources. In fact, doing so may take five years or longer: one or more years to design the program, train staff to implement it, obtain the approval of schools or other organizations to put it in place, and recruit teens; one or more years to actually run the program with a sufficient number of teens; two years to collect follow-up data; and one or more years to clean the data, conduct statistical analyses, and write reports. In addition, conducting studies that meet these criteria requires knowledgeable and competent staff and hundreds of thousands, if not millions, of dollars.

Consequently, this discussion of methodological principles is not meant to suggest that it is easy, possible, or even desirable to incorporate every principle into every study. In some studies, it may be ethically unacceptable or administratively impossible to assign participants to intervention and comparison groups at random or to have large sample sizes. In other studies, it may be ethically and theoretically possible to incorporate these principles, but financially impossible. Moreover, efforts to prevent teen pregnancy and STD/HIV may advance more rapidly if many innovative programs are developed and evaluated less rigorously and less expensively at the outset, and then only those programs with encouraging results are subsequently evaluated more rigorously. After all, with limited resources it is not possible to evaluate every creative program rigorously at the outset.

Despite its very real limitations, research in this field has made remarkable progress over the years. For example, 25 years ago, only a few studies of sex education programs had been carried out. Of those studies, only a few used experimental designs with random assignment; most had small sample sizes; most measured only short-term effects; few measured actual behavior; some used inappropriate statistical tests; some reported only positive results; and none replicated previous studies. Today, many studies use random assignment, have large sample sizes, measure effects for a year or more, measure a variety of sexual and contraceptive behaviors, use appropriate statistical tests, and report both positive and negative results. A few have even replicated previous studies and reported similar positive results. This progress inspires greater confidence in the reported results of research.

## EFFECTS OF RESEARCH METHODS ON THE STRENGTH OF EVIDENCE

The strengths and limitations of the research methods used in studies of programs to prevent teen pregnancy and STD/HIV have important implications for this review, for selecting programs to be replicated, and for future research:

- ☆ The limitations of the studies, coupled with possible biases, constrain one from making definitive statements about specific programs

or types of programs. Generalizations should be made cautiously and should be based on general patterns of results, not single results in single studies.

☆ Possible biases may be big or small and undoubtedly operate in both positive and negative directions. For example, on the one hand, many studies are based on insufficient sample sizes and may therefore obscure programmatically meaningful results. On the other hand, some studies fail to adjust for clustering, fail to adjust for multiple tests of significance, or publish results only if positive outcomes are found, creating bias in a positive direction. Although these biases partially counteract each other, the overall effect is probably that study results appear more positive than justified.

☆ Especially because of insufficient sample sizes, it is very difficult to assess accurately the magnitude of a program's impact. The confidence intervals around estimates of effects are simply too large to make precise statements about magnitude. In addition, magnitude of effects sometimes varies with the outcome being measured: for example, magnitude may be greater for one measure of contraceptive use than another.

☆ The quality of a study's research design and the resulting evidence should be given considerable weight when assessing reported program results and when selecting programs for replication.

☆ Despite great progress, more evaluations with rigorous design, appropriate statistical analysis, and accurate reporting of results are needed. Many examples of rigorous research and progress in research methods demonstrate that such studies can be conducted. Public and private funders need to recognize fully the time and resources necessary to conduct rigorous studies.

☆ Although few studies meet all of the research criteria discussed above, much can be learned from the many less-than-perfect studies that have been conducted, particularly if the limitations of each study are kept in mind and the patterns of results across studies are observed. The review of studies in Chapters 6 and 8 takes into account these limitations and patterns; a study-by-study summary of the characteristics of each evaluation can be viewed online at www.teenpregnancy.org/EA2007 or www.theNationalCampaign.org/EA2007.

☆ When an evaluation shows positive results of a program, the program should be implemented and evaluated with different staff and different research teams and with different types of young people in different locations—all in an effort to assess the extent to which the original positive results apply to different settings, samples, and conditions. If the positive results of the first study are found again in one or more subsequent studies, then the program should be implemented more widely. Even then, attention must be paid to the particular groups, settings, and other conditions in which the program was found to be effective.

☆ ☆ ☆

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- ☆ This chapter reviews the effects of 56 studies of curriculum-based programs—eight of them (14 percent) focused on reducing teen pregnancy, 25 (45 percent) focused on preventing STD/HIV, and 23 (41 percent) focused on both.
- ☆ Two-thirds of the programs studied were successful—that is, they had a significant positive impact on at least one aspect of sexual behavior or lowered the rates of pregnancy, childbearing, or STD.
- ☆ Although abstinence and comprehensive programs are examined separately, the programs actually fall along a continuum and are not easy to categorize.
- ☆ Several abstinence programs, including abstinence-until-marriage programs, have been *rigorously* evaluated in experimental studies with large samples and found to have no overall impact on delay of initiation of sex, age of initiation of sex, return to abstinence, number of sexual partners, or use of condoms or other contraceptives.
- ☆ A few other abstinence programs have been evaluated less rigorously, with smaller, quasi-experimental designs. Results suggest that two of them may have had some positive effects on sexual behavior. One program appeared to delay the initiation of sex among middle school students, and the other appeared to decrease the frequency of sex and reduce the number of sexual partners. In sum, no abstinence program has strong evidence of delaying sex, but one has modest evidence of doing so.
- ☆ Forty-eight comprehensive sex and STD/HIV education programs were studied, but not all of the programs targeted the same behavior. Results showed that 15 of 32 programs (47 percent) delayed the initiation of sex, six of 21 (29 percent) reduced the frequency of sex, and 11 of 24 (46 percent) reduced the number of sexual partners. None of the programs hastened the initiation of sex. In addition, 15 of 32 (47 percent) of the programs increased condom use, four of nine (44 percent) increased the use of other contraceptives, and 15 of 24 (63 percent) reduced sexual risk through changes in a combination of types of behavior. Thus, strong evidence shows that these programs do not increase sexual activity and, moreover, that some of them reduce sexual activity, increase the use of condoms or other contraceptives, or both.
- ☆ In general, even the effective programs did not *dramatically* reduce risky sexual behavior or the rates of pregnancy or STD. The most effective programs tended to lower risky sexual behavior by about one-third.
- ☆ Comprehensive programs were effective in different communities, in different settings, and with different groups of young people (e.g., different sex or different racial and ethnic groups).

CHAPTER SIX

# Effects of Curriculum-Based Sex and STD/HIV Education Programs

During the last two decades, professionals concerned with teen pregnancy and STD have viewed curriculum-based sex and STD/HIV education programs as a partial solution to these problems (Box 4-1). Indeed, sex and STD/HIV education programs based on a written curriculum and implemented among groups of young people in school, clinic, or community settings have had success in reducing risky sexual behavior, have been implemented in many schools across the country, and are supported by a large percentage of the American public (Box 6-1).

These education programs are commonly implemented in schools, for a variety of reasons. School is the one institution that is regularly attended by most young people. Of those who attend school, most do so before they initiate sex; some are enrolled in school when they do initiate sex. Many sex and STD/HIV education programs are well designed to be implemented in school classrooms. In addition, schools are designed and structured to teach both knowledge and skills; thus, with appropriate training, many teachers can implement the programs.

However, not all young people attend school and not all young people remain in school until they initiate sex. To reach out-of-school teens, curriculum-based sex and STD/HIV education programs have been implemented in youth-serving agencies, housing projects, faith communities, community centers, juvenile detention centers, and elsewhere.

This chapter presents the results of 56 studies that measured the impact of curriculum-based sex and STD/HIV education programs on both behavior and risk and protective factors that mediate behavior. Chapter 7 summarizes the important characteristics of programs that changed behavior.

## CHARACTERISTICS OF PROGRAMS

Studies of 56 curriculum-based programs met the criteria for inclusion in this review (see Chapter 4). Seven of them were studies of eight abstinence programs [1-7], and the remaining 48 were studies of comprehensive programs, which encourage both abstinence and the use of condoms or other forms of contraception among young people who are sexually active [8-54]. Because of the considerable diversity of the programs themselves, the communities in which they were implemented, and their methods of evaluation, important characteristics are summarized in Table 6-1.

Most of the programs were implemented in urban areas, and more than two-thirds were implemented in low-income communities and communities with high rates of STD/HIV. More than half were conducted in schools only, about one-quarter in community settings only, and about one-tenth in health clinics. The rest were implemented in more than one setting.

Despite being implemented throughout the country and among different age groups, the programs themselves had numerous qualities in common. Many of them incorporated many of the characteristics of programs previously found to be associated with effectiveness [55].

### Box 6-1: Support for Sex and STD/HIV Education

A very large majority of American adults believe that sex education programs should be taught in schools. For example, in 2003, a poll of a representative sample of U.S. adults found that 90 percent thought sex education should be part of the school curriculum, and only 7 percent thought sex education should not be offered in schools [1].

Even more important is the very broad agreement that both abstinence and the use of condoms and other contraceptives should be part of a sex education program. A 2005 poll found that 82 percent of U.S. adults thought comprehensive sex education, which covers both abstinence and other methods of preventing pregnancy and STD, should be implemented in schools [2].

The evidence for this broad support is further enhanced by the fact that the results of such polls are similar, regardless of who conducts or funds them. For example, the 2003 poll mentioned above, conducted by National Public Radio, the Kaiser Family Foundation, and Harvard University, found that the vast majority of adults believed that school curricula should include "waiting to have intercourse until older" (95 percent), "waiting to have sexual intercourse until married" (93 percent), "how to use and where to get contraceptives" (86 percent), and "how to use a condom" (83 percent). A comparable poll of parents, funded by the more conservative Heritage Foundation and conducted by Zogby International in 2003, found that 75 percent of parents believed that sex education should include discussions of both abstinence and condoms [3]. The National Campaign to Prevent Teen Pregnancy has found that 74 percent of adults thought that it was very important "for teens to be given a strong message from society that they should not have sex until they are at least out of high school" [4] and that 74 percent of adults believed that teens should get more information about both abstinence and contraception, not less of either [5].

Clearly, there is very broad support for comprehensive sex education that strongly emphasizes abstinence as the best behavior for young people but also discusses use of condoms and contraception for those who do have sex. That is, both parents and other adults want the advantages of abstinence to be strongly emphasized, but they also want teens to have the needed knowledge and skills to use condoms and other contraceptives.

At the same time, however, this broad support does not mean that there is complete unanimity on the topic. Indeed, vocal minorities are calling for programs that teach only abstinence. For example, according to the 2003 Zogby poll, 22 percent of adults believe that sex education should focus only on abstinence and not include information on condoms, and 2 percent felt that abstinence was not important and programs should focus only on condoms [3].

Analyses of national polling results reveal that broad support for comprehensive sex education is consistent across the country. In addition, polls conducted in several states that are traditionally more conservative (North Carolina, South Carolina, and Texas) also reveal strong support for programs that encourage abstinence and discuss condoms and contraceptives [6; 7].

Strong support for sex education is not new; it has existed for decades. Numerous polls since the early 1980s have demonstrated this support. For example, four national Gallup polls conducted between 1981 and 1998 revealed continual increases in the number of American adults who believed that public high schools should offer sex education programs—from 70 percent in 1981 to 87 percent in 1998 [8]. Similarly, a 1999 Hickman-Brown national opinion poll found that 93 percent of adults supported sexuality education in schools [9].

Of the 56 programs, eight (14 percent) focused only on reducing teen pregnancy, 24 (43 percent) focused only on preventing the spread of STD/HIV, and 24 (43 percent) focused on both. The greater emphasis on STD/HIV prevention reflects both concern about young people contracting HIV and the increased funding and other resources devoted to preventing the spread of STD/HIV in recent years.

None of the programs was designed to prevent alcohol use, drug use, or violence. Programs that focus on those outcomes as well as disease and pregnancy prevention are discussed in Chapter 8.

Virtually all of the programs targeted specific types of behavior. The majority (86 percent) promoted abstinence but also discussed or promoted the use of condoms and other forms of contraception if young people chose to be sexually active. Fourteen percent encouraged only abstinence.

Most of the programs (92 percent) identified one or more theories on which they were based and often specified particular psychosocial mediating factors they wanted to change. Most of the programs (94 percent) included at least two interactive activities designed to involve young people and help them personalize newly learned information (e.g., role playing, simulations, or individual worksheets that applied lessons to their lives).

Length was the one area of great variation in these programs. While the median program lasted 10 hours, the range was from less than one hour to 48 hours.

To evaluate program effectiveness, 33 of the studies (59 percent) employed an experimental design with random assignment of individual teens, classrooms, schools, or communities. The remaining 23 studies used a quasi-experimental design. Of the 56 studies, 38 (68 percent) measured impact for a year or longer, while nine (16 percent) measured the effects for two years or longer. The longest study measured impact for just less than five years.

## IMPACT OF PROGRAMS

More than 600 tests were done to determine the statistical significance of the findings in the 56 studies. Some of the tests were significant by chance alone, whether in the direction of a desired outcome (about 15 tests) or an undesired outcome (another 15 tests). For this reason, *patterns* of results should be given greater weight than individual results.

### Impact on Sexual Behavior

The studies examined the effects of programs on several important types of sexual behavior, including the initiation of sex, frequency of sex,

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### Table 6-1: Characteristics of Curriculum-Based Sex and STD/HIV Education Programs, Studies, and Samples[1]

| Characteristic | Percent |
|---|---|
| **Programs and Studies** | |
| Location (N=52) | |
| Rural | 10% |
| Urban | 63 |
| Both | 27 |
| Income Level (N=33) | |
| Low | 67% |
| Medium or mixed | 33 |
| Reported STD/HIV Risk in Community (N=43) | |
| Low | 2% |
| Medium or mixed | 26 |
| High | 72 |
| Implementation Site (N=56) | |
| School only | 59% |
| Community only | 27 |
| School and community | 4 |
| Health clinic only | 9 |
| Health clinic and other | 2 |
| Type of School (N=40) | |
| Elementary | 2% |
| Middle | 37 |
| High | 35 |
| Mixed | 15 |
| School setting outside school hours | 10 |

| Characteristic | Percent |
|---|---|
| **Programs** | |
| Goals (N=56) | |
| Reduce HIV and other STDs | 43% |
| Reduce unintended teen pregnancy | 14 |
| Reduce both | 43 |
| Behavioral Focus (N=56) | |
| Encouraged abstinence | 14% |
| Encouraged abstinence and condom or contraception use if sexually active | 86 |
| Identified Theoretical Basis (N=55) | |
| Yes | 92% |
| No | 8 |
| Included Two or More Interactive Methods (N=53) | |
| Yes | 94% |
| No | 6 |
| Length (hours) (N=55) | |
| 1 or less | 2% |
| 2 to 5 | 21 |
| 6 to 10 | 25 |
| 11 to 15 | 27 |
| 16 to 20 | 16 |
| 21 to 51 | 9 |
| Type of Educator (N=47) | |
| Classroom teacher or regular staff | 23% |
| Outside educator | 47 |
| Peer educator | 6 |
| Classroom teacher and peer educator | 6 |
| Outside educator and peer educator | 15 |
| Classroom teacher and outside educator | 2 |

1. Sample sizes change because not all studies reported every characteristic.
2. Studies used means, median, and ranges to describe age. In this table, the mean was used if available, the median was used if the mean was not available, and the midpoint of the range was used if neither the mean nor the median was available.

**Table 6-1: Characteristics of Curriculum-Based Sex and STD/HIV Education Programs, Studies, and Samples (Con't.)**

| Characteristic | Percent |
|---|---|
| **Study Methods** | |
| Study Design (N=56) | |
| Experimental | 59% |
| Quasi-experimental | 41 |
| Survey Design (N=56) | |
| Matched cohort | 93% |
| Unmatched cross-section | 7 |
| Types of Behavior Measured (N=56) | |
| Sexual behavior only (e.g., initiation of sex, number of partners, frequency of sex) | 7% |
| Condom or contraceptive use only | 2 |
| Both sexual behavior and condom or contraceptive use | 91 |
| Method of Measuring Pregnancy (N=36) | |
| Self-reports | 96% |
| Laboratory tests | 4 |
| Method of Measuring STD (N=24) | |
| Self-reports | 93% |
| Laboratory tests | 7 |
| Time (months) from Baseline to Last Follow-up (N=56) | |
| 3 to 5 | 13% |
| 6 to 11 | 20 |
| 12 to 23 | 52 |
| 24 to 57 | 16 |

| Characteristic | Percent |
|---|---|
| **Samples** | |
| Size at First Follow-up (at 3 or more months) (N=55) | |
| 100 to 199 | 11% |
| 200 to 499 | 30 |
| 500 to 999 | 36 |
| 1,000 to 1,999 | 9 |
| 2,000 to 4,999 | 14 |
| Gender (N=52) | |
| Boys only | 8% |
| Mixed boys and girls | 80 |
| Girls only | 12 |
| Average Age[2] (years) (N=51) | |
| 10.5 to 13.9 | 33% |
| 14.0 to 17.9 | 65 |
| 18.0 to 23.0 | 2 |

number of sexual partners, use of condoms, use of other contraceptives, and sexual risk-taking. Patterns of results across the studies demonstrate two findings very clearly. First, a substantial percentage of abstinence, sex, and STD/HIV education programs significantly reduced one or more types of risky sexual behavior. Second, the programs did not increase sexual behavior among young people, as some people had feared (Table 6-2).

*Initiation of sex*

An important measure of sexual behavior is the timing of initiation of sex. The studies show that these education programs do not hasten the initiation of sex; in fact, some programs delay it. Of the 40 studies that measured impact on the initiation of sex, 16 (40 percent) found that the programs significantly delayed the initiation of sex among one or more population subgroups for at least six months, 24 (60 percent) found no significant impact, and no study found that programs hasten the initiation of sex.

Programs were effective in school, clinic, and community settings, with both genders, and in both age groups studied (Table 6-3).

*Frequency of sex*

Another measure of sexual behavior is the frequency—or absence—of sex during a specified period of time (e.g., three months or six months prior to the survey). When respondents report not having had sex during the specified time, this measure may be labeled "being abstinent" or "returning to abstinence." Frequency of sex is an important measure for both pregnancy and STD prevention.

In general, these sex and STD/HIV education programs did not increase the frequency of sex; some of them even reduced it (Table 6-2). Of the 27 studies that measured impact on frequency of sex, eight (30 percent) found that programs reduced the frequency, 19 (70 percent) found no significant change in frequency, and none found an increase in frequency. These results held true for the entire sample as well as for any major population subgroup at any time.

Programs were effective in school, clinic, and community settings and among both middle school and high school students. Programs may have been more effective with boys than girls, but too few studies report results by gender to measure relative effectiveness for certain (Table 6-3).

*Number of sexual partners*

A third measure of sexual behavior is number of sexual partners during a specified period of time prior to the survey. As noted in Chapter 2, this measure is critical in preventing the spread of STDs, but less important for preventing pregnancy.

In general, programs did not increase the number of sexual partners; some decreased the number. Twenty-nine studies measured this outcome: 12 of them (41 percent) lowered the reported number of sexual partners, while 16 (55 percent) had no significant impact. Only one program (3 percent) found a significant increase in the number of partners.

Programs in school, community, and clinic settings were effective at reducing the number of sexual partners. These programs were about equally effective with both genders.

*Use of condoms*

Thirty-seven studies measured the impact of programs on condom use. Fifteen of the studies (41 percent) found increased condom use among an entire sample or among one or more subgroups; none of them found that programs reduced condom use. Programs were effective in school, clinic, and community settings; they were equally effective with both genders.

*Use of other contraceptives*

Only 13 studies measured the impact of programs on contraceptive use more generally (as opposed to condom use specifically). Of these studies, four found increased contraceptive use;

## Table 6-2: Curriculum-Based Sex and STD/HIV Education Programs—Number of Studies Reporting Effects on Sexual Behavior and Outcomes

| Outcome Measured | Abstinence Programs N=8) | Comprehensive Programs (N=48) | All Programs (N=56) | |
|---|---|---|---|---|
| **Delay Sex** | (N=8) | (N=32) | (N=40) | |
| Delayed Initiation | 1 | 15 | 16 | 40% |
| No Significant Results | 7 | 17 | 24 | 60% |
| Hastened Initiation | 0 | 0 | 0 | 0% |
| **Reduce Frequency of Sex** | (N=6) | (N=21) | (N=27) | |
| Reduced Frequency | 2 | 6 | 8 | 30% |
| No Significant Results | 4 | 15 | 19 | 70% |
| Increased Frequency | 0 | 0 | 0 | 0% |
| **Reduce Number of Partners** | (N=5) | (N=24) | (N=29) | |
| Reduced Number | 1 | 11 | 12 | 41% |
| No Significant Results | 4 | 12 | 16 | 55% |
| Increased Number | 0 | 1 | 1 | 3% |
| **Increase Condom Use** | (N=5) | (N=32) | (N=37) | |
| Increased Use | 0 | 15 | 15 | 41% |
| No Significant Results | 5 | 17 | 22 | 59% |
| Reduced Use | 0 | 0 | 0 | 0% |
| **Increase Contraceptive Use** | (N=4) | (N=9) | (N=13) | |
| Increased Use | 0 | 4 | 4 | 31% |
| No Significant Results | 4 | 4 | 8 | 62% |
| Reduced Use | 0 | 1 | 1 | 8% |
| **Reduce Sexual Risk-Taking** | (N=3) | (N=24) | (N=27) | |
| Reduced Risk | 0 | 15 | 15 | 56% |
| No Significant Results | 3 | 9 | 12 | 44% |
| Increased Risk | 0 | 0 | 0 | 0% |
| **Reduce Pregnancy: Self-Report** | (N=4) | (N=6) | (N=10) | |
| Reduced Number | 0 | 2 | 2 | 20% |
| No Significant Results | 3 | 4 | 7 | 70% |
| Increased Number | 1 | 0 | 1 | 10% |
| **Reduce Pregnancy: Laboratory Test** | (N=0) | (N=2) | (N=2) | |
| Reduced Number | 0 | 0 | 0 | 0% |
| No Significant Results | 0 | 2 | 2 | 100% |
| Increased Number | 0 | 0 | 0 | 0% |
| **Reduce Childbirth: Self-Report** | (N=3) | (N=1) | (N=4) | |
| Reduced Number | 0 | 1 | 1 | 25% |
| No Significant Results | 3 | 0 | 3 | 75% |
| Increased Number | 0 | 0 | 0 | 0% |
| **Reduce STDs: Self-Report** | (N=4) | (N=2) | (N=6) | |
| Reduced Number | 0 | 0 | 0 | 0% |
| No Significant Results | 3 | 2 | 5 | 81% |
| Increased Number | 1 | 0 | 1 | 17% |
| **Reduce STDs: Laboratory Test** | (N=0) | (N=4) | (N=4) | |
| Reduced Number | 0 | 2 | 2 | 50% |
| No Significant Results | 0 | 2 | 2 | 50% |

Table 6-3: Curriculum-Based Sex and STD/HIV Education Programs—Number of Studies Reporting Effects on Sexual Behavior and Outcomes by Setting and Gender and Age of Participants

| Outcome Measured | Setting | | | | Gender | | Age | |
|---|---|---|---|---|---|---|---|---|
| | School (N=33) | Commu-nity (N=33) | Clinic (N=5) | Mixed (N=3) | Boys (N=13) | Girls (N=15) | Under 14 (N=29) | 14 or older (N=22) |
| **Delay Sex** | (N=30) | (N=7) | (N=1) | (N=2) | (N=9) | (N=9) | (N=24) | (N=12) |
| Delayed Initiation | 12 | 2 | 1 | 1 | 4 | 2 | 8 | 5 |
| No Significant Results | 18 | 5 | 0 | 1 | 5 | 7 | 16 | 7 |
| Hastened Initiation | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reduce Frequency of Sex** | (N=18) | (N=6) | (N=1) | (N=2) | (N=2) | (N=1) | (N=18) | (N=6) |
| Reduced Frequency | 5 | 2 | 1 | 0 | 2 | 0 | 5 | 2 |
| No Significant Results | 13 | 4 | 0 | 2 | 0 | 1 | 13 | 4 |
| Increased Frequency | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reduce Number of Partners** | (N=15) | (N=9) | (N=4) | (N=1) | (N=5) | (N=5) | (N=12) | (N=16) |
| Reduced Number | 5 | 4 | 3 | 0 | 2 | 2 | 4 | 8 |
| No Significant Results | 10 | 4 | 1 | 1 | 3 | 2 | 8 | 7 |
| Increased Number | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| **Increase Condom Use** | (N=21) | (N=11) | (N=3) | (N=2) | (N=8) | (N=7) | (N=22) | (N=12) |
| Increased Use | 6 | 7 | 2 | 0 | 5 | 3 | 5 | 8 |
| No Significant Results | 15 | 4 | 1 | 2 | 3 | 4 | 17 | 4 |
| Reduced Use | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Increase Contraceptive Use** | (N=10) | (N=1) | (N=0) | (N=2) | (N=3) | (N=3) | (N=7) | (N=5) |
| Increased Use | 4 | 0 | 0 | 0 | 2 | 1 | 2 | 1 |
| No Significant Results | 5 | 1 | 0 | 2 | 1 | 2 | 5 | 3 |
| Reduced Use | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| **Reduce Sexual Risk-Taking** | (N=11) | (N=12) | (N=4) | (N=0) | (N=7) | (N=7) | (N=9) | (N=15) |
| Reduced Risk | 4 | 8 | 3 | 0 | 3 | 6 | 4 | 10 |
| No Significant Results | 7 | 4 | 1 | 0 | 4 | 1 | 5 | 5 |
| Increased Risk | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reduce Pregnancy: Self-Report** | (N=7) | (N=1) | (N=1) | (N=1) | (N=1) | (N=3) | (N=5) | (N=5) |
| Reduced Number | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 2 |
| No Significant Results | 7 | 0 | 0 | 0 | 1 | 1 | 4 | 3 |
| Increased Number | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| **Reduce Pregnancy: Laboratory Test** | (N=1) | (N=1) | (N=0) | (N=0) | (N=0) | (N=1) | (N=1) | (N=1) |
| Reduced Number | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| No Significant Results | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| Increased Number | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reduce Childbirth: Self-Report** | (N=3) | (N=1) | (N=0) | (N=0) | (N=0) | (N=1) | (N=3) | (N=1) |
| Reduced Number | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 1 |
| No Significant Results | 3 | 0 | 0 | 0 | 0 | 0 | 3 | 0 |
| Increased Number | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Reduce STDs: Self-Report** | (N=5) | (N=0) | (N=0) | (N=1) | (N=0) | (N=0) | (N=4) | (N=2) |
| Reduced Number | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| No Significant Results | 5 | 0 | 0 | 0 | 0 | 0 | 3 | 2 |
| Increased Number | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |
| **Reduce STDs: Laboratory Test** | (N=0) | (N=1) | (N=3) | (N=0) | (N=0) | (N=4) | (N=0) | (N=4) |
| Reduced Number | 0 | 0 | 2 | 0 | 0 | 2 | 0 | 2 |
| No Significant Results | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 2 |
| Increased Number | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

eight found no effect, and one reported decreased use of contraceptives.

Most of the programs studied were in school settings; too few studies of clinic- or community-based programs were done to reach any conclusions. Programs were equally effective for both genders and both age groups.

*Sexual risk-taking*

Pregnancy and the spread of STD/HIV can be reduced either by decreasing sexual activity or by increasing condom or contraceptive use. Accordingly, some studies assessed sexual risk-taking by developing composite measures of sexual activity and condom use, such as "frequency of unprotected sex" or "number of unprotected sexual partners." These measures are strongly related to rates of pregnancy and STD/HIV.

Twenty-seven studies measured risky sexual behavior with such composites. Fifteen (56 percent) found that sex and STD/HIV education programs significantly reduced sexual risk-taking. None of the programs increased sexual risk-taking.

The programs were effective in school, clinic, and community settings, for both genders, and with both age groups.

## Impact on Health Goals

The studies also examined the effects of sex and STD/HIV education programs on their health goals. The three measures used were the rates of pregnancy, birth, and STD. Because HIV is relatively rare among young people, from a statistical standpoint, studies did not measure impact on HIV rates.

*Rates of pregnancy, birth, and STD*

Twelve studies measured program impact on pregnancy rates; ten of them were based on self-reports, and two were based on laboratory results. Two of the studies based on self-reports found a significant decrease in pregnancy rate, while one found a significant increase. Neither of the studies based on laboratory tests found a significant change.

Only four of the 56 studies measured program impact on birth rates. One found a significant decrease in birth rates, while three failed to find any significant impact.

Ten studies measured the effect of programs on rates of STD, six using self-reports and four using laboratory tests. One of the six studies based on self-reports found a significant increase in STD rates. (This may have been caused by the fact that the program encouraged young people to be tested for STDs and thus may have resulted in more reports of STD, even if in fact the respondents were not actually more likely to have an STD.) The other three studies based on self-reports found no impact. Of the four studies based on laboratory tests, two found that programs significantly decreased rates of STD. Because studies based on laboratory tests are less subject to bias than those based on self-reports, these findings are encouraging.

Overall, the 22 studies measuring rates of pregnancy, childbearing, and STD present a mixed picture. Seven of the 22 results of those studies were significant, five in a positive direction and two in a negative direction (one of which may have been caused by biased methodology). A true meta-analysis is needed to assess properly the impact of these programs on rates of pregnancy, childbearing, and STD.

Because pregnancy, childbearing, and STDs are relatively uncommon among teens, any study of program impact on these measures would require a large sample in order to detect a statistically significant effect. Only three of 22 studies that measured impact on pregnancy, birth, or STD rates included more than 1,000 persons. Programs with smaller samples may have markedly lowered the rate of pregnancy, childbearing, STD, or all three, but these changes would not have been found statistically significant.

### Analysis of Program Effects

Overall, studies indicate strongly that these sex and STD/HIV education programs were far more likely to have a positive impact on behavior than a negative impact. Of the 56 programs reviewed, 35 (63 percent) found a significant positive impact on one or more types of sexual behavior, while only two (4 percent) found a significant negative effect on one or more types of behavior. Given the large proportion of studies that found significant positive results and the large number of tests of significance reported in those studies, some 20 percent of the 70 positive results may have occurred by chance. On the other hand, given that multiple coefficients were examined in each study, the percentage of significant negative results found is less than the percentage likely to have occurred by chance, suggesting that some or all of them may have occurred by chance.

Twenty of the programs (36 percent) had a positive impact on two or more measures of sexual behavior and contraceptive use. *Becoming a Responsible Teen*, for example, increased abstinence, reduced the number of sexual partners, increased condom use, and reduced the incidence of unprotected sex [49]. Similarly, *Safer Choices* delayed the initiation of sex among Hispanic teens and increased both condom and contraceptive use among teens of all races and ethnicities [56]. These effects are particularly noteworthy because studies of both programs employed an experimental design and measured the impact on behavior for at least one year. More generally, studies indicate that it is possible both to reduce sexual behavior and to increase use of condoms or other contraceptives.

While the positive effects of some programs lasted only a few months, the effects of other programs lasted for years. *Safer Choices* [14], for example, produced positive effects on sexual behavior for 31 months.

Only one study estimated the cost-effectiveness and cost-benefit of a sex education program. That study found that for every dollar invested in the *Safer Choices* program, $2.65 was saved in medical and social costs [57]. The savings were produced by preventing pregnancy and STDs, including HIV.

## ABSTINENCE VERSUS COMPREHENSIVE PROGRAMS

Many people who believe that sex before marriage is wrong, whether for religious, health, or other reasons, also believe either that sex should not be discussed in schools at all or that only abstinence should be encouraged. Some people believe that teaching young, unmarried people where to obtain condoms and contraception, and how to use them, encourages immoral or unhealthful sexual behavior and will thereby increase rates of STD and pregnancy. These people oppose classroom programs that encourage teens to use condoms and contraception if they do have sex.

Other people believe that abstinence is the best protection against STDs and pregnancy, but recognize that many teens do engage in sexual behavior. These people support programs that encourage abstinence but teach young people how to use condoms and other contraceptives if they do have sex.

Still other people believe that sex is a natural part of adolescent development and support instruction on the use of condoms and other forms of contraception, rather than abstinence. Many people who work with older, sexually experienced teens emphasize primarily the use of condoms and other contraceptives.

Because the subject of sex education in school is so controversial, this chapter presents results of abstinence programs (sometimes called abstinence-only programs) separately from those of comprehensive programs. Abstinence programs are defined as those that encourage young people to avoid sex and that do not encourage condom or contraceptive use. Comprehensive programs are those that emphasize abstinence as the safest behavior, but also promote condoms or other

forms of contraception for young people who do have sex.

In reality, programs do not fall neatly into one of these two groups. Rather, they exist along a continuum, which makes some of them difficult to classify. In addition, both groups of programs are very diverse. For example, some abstinence programs are abstinence-until-marriage programs and meet the federal guidelines for such programs (see Box 6-2). Others focus on abstinence but do not emphasize abstinence until marriage. Some abstinence programs strongly encourage abstinence, but nevertheless allow objective discussion of the effectiveness of condoms and contraceptives, while others very strongly oppose the use of condoms and contraceptives and exaggerate their lack of effectiveness. While most abstinence programs are secular, a few are overtly religious. Some are "character education" programs that emphasize basic values; these values are then applied to sexual behavior, as well as to other behavior, such as drug use or violence.

Comprehensive programs are also diverse. Some target younger high school students and emphasize abstinence (while also supporting condom or contraceptive use), while others target older, sexually active teens and therefore give more emphasis to condom or other contraceptive use. Some programs include only education, while others are linked to contraceptive services.

### Impact of Abstinence Programs

Seven studies of ten abstinence programs met the criteria for inclusion in this review (Table 6-2) [1-7] and eight of the ten programs are included in this chapter. Two of the studies were conducted by Mathematica Policy Research (MPR) [3; 7]. The first of the two studies evaluated four abstinence programs, two of which were curriculum-based programs and are included in this chapter and two of which were broader youth development programs and are included in Chapter 8. The second MPR study evaluated a large component in an abstinence program and is included in this chapter.

The two MPR studies are particularly important, for several reasons. They evaluated the impact of multiple abstinence-until-marriage programs that meet the federal guidelines for such programs and that were carefully selected to be representative of effective abstinence programs. They employed rigorous experimental designs

### Box 6-2: A–H Definition of Abstinence Education[1]

A. Have as its exclusive purpose teaching the social, psychological, and health gains to be realized by abstaining from sexual activity

B. Teach abstinence from sexual activity outside marriage as the expected standard for all school-age children

C. Teach that abstinence from sexual activity is the only certain way to avoid out-of-wedlock pregnancy, sexually transmitted diseases, and other associated health problems

D. Teach that a mutually faithful, monogamous relationship in the context of marriage is the expected standard of sexual activity

E. Teach that sexual activity outside the context of marriage is likely to have harmful psychological and physical effects

F. Teach that bearing children out of wedlock is likely to have harmful consequences for the child, the child's parents, and society

G. Teach young people how to reject sexual advances and how alcohol and drug use increases vulnerability to sexual advances

H. Teach the importance of attaining self-sufficiency before engaging in sexual activity

1. Title V, Section 510 (b)(2)(A-H) of the Social Security Act (P.L. 104-193).

and tracked respondents for multiple years. Finally, all of their statistical analyses were rigorous. Results of the studies demonstrated that none of the programs affected initiation of sex, age of initiation of sex, abstinence in the previous 12 months, number of sexual partners, use of condoms, use of contraception, frequency of unprotected sex, pregnancy rates, birth rates or STD rates. Results were the same for the other two programs that were evaluated by MPR and are discussed in Chapter 8.

Only one other study was a rigorous study with an experimental design. Like the MPR study, it also failed to find any impact on initiation of sex, abstinence in the previous 12 months, number of sexual partners, use of condoms, or use of contraception. However, unlike the MPR study, it found that the abstinence program, *Postponing Sexual Involvement*, was significantly related to significant increases in both pregnancy and STD rates [5]. That program was taught in one design by adults and in a second design by peers. Students who received adult-led instruction were neither more nor less likely to report pregnancy during the following 17 months. However, unexpectedly students who were taught by peers were more likely to report being pregnant or causing a pregnancy than the control group. The authors could not explain this finding, but they attributed it in part to survey responses from a small group of seventh-grade boys in one school. Students taught by adults were more likely to report having been informed that they had an STD, possibly because teachers encouraged students to be tested for STDs.

The remaining studies of four abstinence programs were much less rigorous and included only quasi-experimental designs. Of those four programs, only one program, *Sex Can Wait*, delayed initiation of sex [1]; the other three programs had no significant impact. The study of *Sex Can Wait* provided only modest evidence of a delay, however: the study employed a quasi-experimental design, fewer than half of the respondents completed follow-up surveys, the significance level was exactly .05, and the results were significant for children in middle school, but not those in elementary or high school. In addition, it should be noted that *Sex Can Wait* was one of the programs evaluated in the sixth grade in the MPR study and in that far more rigorous study, when the combined impact of both *Postponing Sexual Involvement* and *Sex Can Wait* was evaluated, the MPR study did not find any significant impact on the initiation of sex.

Two studies with quasi-experimental designs measured program impact on frequency of sex among young people who had previously had sex and they found that *Sex Can Wait* and *For Keeps* reduced the frequency of sex [1; 6]. However, again, Sex Can Wait was evaluated more rigorously in the MPR study and when combined with *Postponing Sexual Involvement* did not reduce the frequency of sex in that study. One study with a quasi-experimental design also found that *For Keeps* reduced the number of sexual partners [6].

In regard to use of condoms, the only study with a quasi-experimental design that measured use of condoms found that abstinence programs had no significant impact on its use.

Parenthetically, it should be noted that an abstinence-focused version of the *Making a Difference* program was evaluated with a strong experimental design [58]. The results are not included here because neither a report nor article presenting the results is yet available. However, the findings, presented at a professional meeting, indicated that the program did delay sex for two years.

It should also be noted parenthetically that a study of *Heritage Keepers* failed to meet the criteria for inclusion in this study because it did not have a well-matched comparison group and the baseline differences favored the intervention group [59]. However, the study did use statistical procedures to try to adjust for the large baseline differences between the intervention and comparison schools, and the resulting analyses suggest that the program did delay the initiation of sex. When one large component of the *Heritage Keepers* program was evaluated in the second MPR study, it failed to have a significant impact on any behavior [7].

Taken together, these studies find no strong evidence that any particular abstinence program delays the initiation of sex, although they hint that future studies may find a positive effect for one or more programs. In addition, very modest evidence indicates that two abstinence programs may help young people return to abstinence or reduce their number of sexual partners, but in one case the positive results were not confirmed by the more rigorous MPR study.

### Impact of Comprehensive Programs

Not surprisingly, results from the 48 studies of comprehensive sex and STD/HIV education programs mirror those from all 56 studies, although the findings were more positive because they did not include results from the abstinence studies. Thus, 15 of 32 comprehensive programs (47 percent) delayed the initiation of sex and none hastened it, while six of 21 (29 percent) reduced the frequency of sex or increased the return to abstinence and none increased the frequency of sex. Eleven of 24 (46 percent) reduced the number of sexual partners, but one increased the number. This is the only negative result out of 78 results for measures of sexual behavior, and it is less than would be estimated by chance. The results therefore provide strong evidence that comprehensive programs do not increase sexual behavior.

Fifteen of 32 studies (47 percent) reported increased use of condoms; four of nine (44 percent) found increased contraceptive use, and one found decreased use. Finally, 15 of 24 studies (63 percent) showed a reduction in unprotected sex (e.g., the frequency of sex without condoms). Thirty-three of 48 studies (69 percent) found that programs reduced risky sexual behavior by improving one or more types of behavior, and 18 of 48 (38 percent) improved two or more types of behavior.

Two studies out of eight found a significant reduction in teen pregnancy rates. The only study of program impact on birth rates reported a significant decrease, and two out of six studies saw significant reductions in STD rates. Both of the latter studies based their findings on laboratory tests, which are more reliable than self-reports.

These findings are very encouraging. They indicate that some programs can significantly reduce rates of teen pregnancy, childbearing, or STD, even though most studies simply do not have sufficient statistical power to detect the reductions.

*Robustness of findings*

The positive findings from studies of comprehensive programs were remarkably robust. The patterns of findings were similar, regardless of whether the study design was experimental or quasi-experimental. Of the 32 studies with an experimental design, 19 (59 percent) found a significant positive impact on one or more measures of sexual behavior, while 16 of 23 studies (70 percent) with a quasi-experimental design found a positive impact on one or more measures. This suggests that a large majority of the programs were effective. Moreover, because experimental studies are generally more rigorous (e.g., they use more rigorous statistical analyses), the positive results are unlikely to result from weak study methodologies.

The programs themselves were found to be effective in different communities and cultures throughout the country. Some programs were effective with low- as well as middle-income teens, in low- as well as middle-income communities, and in rural as well as urban areas.

Programs were effective in school, clinic, and community settings. A few of the successful community programs were actually conducted on school grounds on Saturdays. Because those programs were not implemented during the school day, they may have been able to include condom-related activities that might not have been allowed in school classes, and these activities may have contributed to the success of the programs.

Both genders benefited from the comprehensive programs. Notably, studies showed that even girls, who have less direct control over condom use, reported using condoms more frequently. Programs were also effective with younger as well as older teens.

These findings do not imply that the same program can be effective with all groups. Rather, programs can be effective if they are designed appropriately for each group of young people in each community.

Robustness of study results should not be confused with magnitude of impact. In general, the programs did not dramatically reduce sexual risk-taking or rates of STD or pregnancy. Typically, the most effective programs tended to reduce sexual risk-taking by about a third or less. Therefore, curriculum-based sex and STD/HIV education programs are not a complete solution to the problems of unintended pregnancy, HIV, or other STDs; instead, they can be an effective component of a larger effort.

*Replication of results*

A critical question remains. Can a well-designed, skillfully implemented program that has been found to be effective in an experimental study also be effective when implemented by other people in other communities?

Four programs in the United States have now been replicated and evaluated in randomized trials. Three of them have produced positive changes in sexual behavior in the majority of replications. *Be Proud! Be Responsible!* and curricula derived from it have been evaluated the greatest number of times [26]. These programs were designed to be implemented outside school, often on Saturdays. *Be Proud! Be Responsible!* was originally evaluated for three months in a randomized trial of boys only and found to have a significant positive impact on condom use and other behavior during that period. It was then evaluated for six months in different communities with both boys and girls and was found to reduce the incidence of unprotected sex for that period as well [28]. The program was slightly modified, lengthened, and named *Making Proud Choices! A Safer Sex Curriculum.* This new program produced positive effects on condom use and other measures of behavior for a year [27]. The program was then implemented in 86 community-based organizations. In the largest replication study to date, *Making Proud Choices! A Safer Sex Curriculum* again exhibited a statistically significant impact on condom use and frequency of unprotected sex during the entire year it was evaluated [25]. After being adapted for Hispanic teens and named *¡Cuı´date!*, the program was found to reduce sexual activity, reduce the number of sexual partners, and increase condom use [52]. *Making Proud Choices! A Safer Sex Curriculum* was also adapted for pregnant and parenting teens in schools and was found to reduce the number of sexual partners [31].

Another randomized trial evaluated the year-long impact of *Be Proud! Be Responsible!* when it was implemented in high school classrooms during the regular school day [10]. Interestingly, the study found that in this setting, the program did not have a significant impact on any sexual behavior. Several reasons have been suggested for the lack of effect. First, the program was constrained from implementing an activity that may have reduced negative attitudes about condoms affecting sexual pleasure. Second, the program was conducted during the school day, when students may have been more tired and less attentive than on Saturdays; participation was not voluntary (and students may therefore have been less open to change); and instructors had greater difficulty implementing activities in small groups. Third, students might have received prior instruction on this topic and thus have been saturated with information. And fourth, the program was implemented among older teens.

*Reducing the Risk* was originally evaluated in 13 communities in California and was found both to delay the initiation of sex and to increase contraceptive use among some groups [29]. This was not a randomized trial, but the comparison group very closely matched the intervention group. The program was then independently evaluated in Arkansas. That study design was not strong and attrition was high, but the program was found to delay initiation of sex and to increase condom use among some groups [24]. A research team in Kentucky evaluated the program twice and found in both studies that *Reducing the Risk* delayed the initiation of sex [17; 54]. One of the two pro-

grams in Kentucky shortened the curriculum from 16 sessions to 12 sessions, but the program still exerted a positive impact.

*Becoming a Responsible Teen* was evaluated in randomized trials in three settings. First, it was implemented in a community setting, where it delayed the initiation of sex, reduced the frequency of sex among sexually active youth, increased condom use, and reduced unprotected sex for the 14 months studied [49]. Second, it was implemented in a drug rehabilitation center, where it increased abstinence, reduced the number of sexual partners, increased condom use, and reduced unprotected sex over 13 months [48]. Third, it was shortened by more than half and implemented in a state juvenile reformatory, where it did not significantly change behavior [47]. These results show that the full-length version had positive effects in two different settings but that the truncated version was not effective in a third setting, whether because the program was substantially shortened, the setting was not conducive to learning, or other factors.

*Focus on Kids* was evaluated in three randomized trials. The first study examined its implementation in an urban setting, where the program increased condom use [60]. The strength of the evidence for that finding was modest, in part because the sample was small (fewer than 100 persons). When the program was adapted for use in a more conservative, rural community (by eliminating some of the condom activities in some or all of the evaluation sites), it was found to have no significant impact on condom use. This failure to replicate earlier results suggests that inclusion of the condom activities may have been critical [50]. The third study evaluated a faithful implementation of the program and found no impact on unprotected sex [39]. However, only 5 percent of the comparison group engaged in unprotected sex, making it difficult for the intervention group to do significantly better (and producing what is known as a ceiling effect); moreover, the study lacked sufficient statistical power to measure impact on unprotected sex. In sum, the evidence from all three studies is weakened by programmatic and methodological limitations, making any conclusions about replication tenuous.

Overall, the results of these studies are quite encouraging, providing greater evidence that curricula can be effective when they are replicated with fidelity by different people in different communities. It is not clear that effective programs will remain effective if they are shortened considerably, if activities that focus on condom use are omitted, if programs designed for community settings are implemented in classroom settings, or if the comparison groups engage in very little unprotected sex, even without the intervention.

*Magnitude of impact*

Because a large percentage of these programs had a statistically significant impact, an important question becomes: What was the magnitude of the impact?

On the one hand, each of the programs had meaningful behavioral results. For example, *Reducing the Risk* cut the incidence of unprotected sex among sexually inexperienced teens nearly in half, from 16 percent to 9 percent [29]. *Safer Choices* reduced the mean number of acts of sexual intercourse not protected by a condom from 3.82 times in a three-month period to 2.44 times, a 37 percent reduction [14]. *Making a Difference: An Abstinence Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* reduced the percentage of young people who had sex during the previous three months by 42 percent, from 22 percent of respondents to 13 percent [27]. *Making a Difference: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* resulted in a 50 percent reduction in the number of respondents who reported having had unprotected sex during the previous month, from 10.8 percent of the group to 5.4 percent; the program also slashed the mean number of acts of unprotected intercourse during the previous month from .51 to .17, a drop-off of 67 percent [27]. *Becoming A Responsible Teen* reduced the number of sexually inexperienced teens who initiated sex during a 12-month period by 63 percent, from 31 percent of respondents to 12 percent [49]. *SIHLE: Sistas, Informing, Healing,*

*Living, Empowering* increased the consistent use of condoms by about 30 percent [16].

All of these findings are very encouraging and suggest that curriculum-based programs may reduce at least one measure of sexual risk by one-third to one-half. However, they typically reduce other measures of sexual risk by less. Thus, the programs may reduce overall sexual risk by roughly one-third, or possibly less.

*Impact on factors that affect sexual risk-taking*

Although the studies described above provide strong evidence that some comprehensive programs reduce risky sexual behavior, they cannot describe how or why without specifying the programs' impact on risk and protective factors. Partial answers can be found by examining the risk and protective factors targeted by programs to change sexual behavior and outcomes (Table 6-4). Specifically:

- ☆ Many of the studies measured impact on knowledge, and a very large majority of them found that programs increase knowledge, particularly about STDs (especially HIV), methods of preventing transmission (especially condoms), and other sexual issues (including methods of contraception). The more frequent changes in knowledge about STDs and methods of preventing them simply reflect the fact that many of the programs focused primarily on preventing STDs, including HIV, and fewer focused on preventing pregnancy.
- ☆ Half of the studies that measured impact on perceived HIV risk found that programs increased the perception of risk.
- ☆ Many studies measured impact on values and attitudes regarding sexual topics, and about half found that programs were effective in improving values and attitudes. Because more studies measured the impact on values and attitudes about abstinence and condoms, the evidence is particularly strong that programs can improve these values and attitudes.
- ☆ While at least two studies revealed that programs had positive effects on perceptions of peer norms about abstinence, condoms, or avoiding sexual risk, fewer than half of the studies succeeded in achieving those effects.
- ☆ About half of the studies that evaluated impact on self-efficacy, as measured by young people's ability to refuse sex, to obtain and use condoms, and to avoid risk, found improvements in these protective factors.
- ☆ About half of the studies that measured impact on motivation or behavioral intentions found greater motivation to avoid sex or restrict the number of sex partners, stronger intention to use a condom, and stronger intention to avoid risk.
- ☆ Of the studies that measured impact on communication, about half found improved communication with partner and with parents.
- ☆ Of the four studies that measured impact on avoiding places that could lead to sex, three found a positive impact.
- ☆ In contrast, only three of 10 programs reduced the use of drugs or alcohol, perhaps because these measures were not a focus of the programs.

In sum, many programs had positive effects on young people's knowledge, awareness of risk, values and attitudes, self-efficacy, and intentions regarding sex—the very factors that determine behavior, according to many psychosocial theories. Furthermore, all of these factors have been demonstrated empirically to be related to their respective sexual behaviors (see Chapter 3) [61]. Therefore, it appears highly likely that changes in these factors contributed to the changes observed in sexual risk-taking.

## CONCLUSIONS

Many of the studies of sex and STD/HIV education programs had significant limitations (see Chapter 5). For example, few described programs adequately; none studied programs for teens

### Table 6-4: Number of Studies of Comprehensive Sex and STD/HIV Education Programs Reporting Effects on Risk and Protective Factors That May Affect Sexual Behavior or Condom or Contraceptive Use

| | Positive[1] Effects | Not Significant | Negative Effects |
|---|---|---|---|
| **Knowledge** | | | |
| Overall knowledge of sexual issues | 7 | 1 | |
| Knowledge of STDs | 8 | | |
| Knowledge of HIV | 17 | 2 | |
| Knowledge of abstinence | | | |
| Knowledge of methods of contraception | 2 | | |
| Knowledge of condoms | 6 | 1 | |
| Knowledge of methods to prevent STD/HIV | 3 | | |
| Knowledge of community or reproductive health services | 1 | | |
| Knowledge of one's own sexual limits | 1 | 2 | |
| **Perceived Risk** | | | |
| Perception of pregnancy risk | | 3 | |
| Perception of STD risk | 1 | 1 | |
| Perception of HIV risk | 4 | 4 | |
| **Perceived Severity of Consequences** | | | |
| Perception of severity of pregnancy and childbearing (including attitude toward childbearing) | 1 | 3 | |
| Perception of severity of STDs | | 1 | |
| Perception of severity of HIV/AIDS | | 2 | |
| **Personal Values and Attitudes** | | | |
| Values about sex/abstinence | 8 | 5 | |
| Attitude about pressuring someone to have sex (including right to say no to sex) | 2 | 2 | |
| Attitudes toward condoms | 6 | 5 | 1 |
| Belief that condoms are a hassle and reduce pleasure | 2 | 5 | |
| Perceived barriers to using condoms | 2 | 3 | |
| Attitude toward risky sexual behavior and AIDS prevention | 3 | 2 | |
| Perceived effectiveness of condoms | 1 | 5 | |
| Perceived effectiveness of condoms to prevent STDs | 1 | 3 | 2 |
| Attitudes toward HIV-positive people (including interacting with them) | 2 | | |
| **Perceived Peer Norms and Behavior** | | | |
| Perception of peer norms/behavior re sex | 4 | 10 | |
| Perception of peer norms/behavior re condoms | 2 | 8 | |
| Perception of peer norms/behavior re avoiding risk | 2 | | |
| Influence of peers | | 1 | |

1. Positive=desirable effect on factor; Negative=undesirable effect on factor.

Table 6-4: Number of Studies of Comprehensive Sex and STD/HIV Education Programs Reporting Effects on Risk and Protective Factors That May Affect Sexual Behavior or Condom or Contraceptive Use (Con't.)

| | Positive[1] Effects | Not Significant | Negative Effects |
|---|---|---|---|
| **Perceived Partner Values** | | | |
| Perceived partner norms and reaction to condom use | | 2 | |
| **Self-Efficacy and Skills** | | | |
| Self-efficacy to show love and affection without sex | 1 | 2 | |
| Self-efficacy to discuss sex, condoms, or contraception with partner | 1 | 1 | |
| Self-efficacy to refuse sex | 7 | 7 | |
| Self-efficacy to obtain condoms | 1 | 1 | |
| Self-efficacy to use condoms | 8 | 5 | |
| Skill at using condoms | 1 | 1 | |
| Self-efficacy to avoid STD/HIV risk and risky behavior (e.g., to abstain or use condoms) | 6 | 5 | 1 |
| General sexual negotiation skills | | 1 | |
| Social competency/locus of control | 2 | | |
| Self-efficacy to control desire | | 2 | |
| Self-efficacy to provide information to peers | | 1 | |
| **Motivation/Intentions** | | | |
| Intention to discuss condoms with partner | | 1 | |
| Intention to abstain from sex, or restrict sex or partners | 10 | 8 | |
| Intention to use a condom | 5 | 5 | 1 |
| Intention to avoid unprotected sex (including perceived likelihood of having sex) | 2 | 1 | |
| **Communication** | | | |
| Communication with partner about AIDS, STDs, and past partners | 1 | 1 | |
| Communication with boy/girlfriend or partner about abstinence or condom use | 2 | 3 | |
| Communication with parents or other adult about sex, condoms, or contraception | 4 | 3 | |
| Comfort talking with parents about sex, condoms, or contraception | 1 | | |

**Table 6-4: Number of Studies of Comprehensive Sex and STD/HIV Education Programs Reporting Effects on Risk and Protective Factors That May Affect Sexual Behavior or Condom or Contraceptive Use (Con't.)**

| | Positive[1] Effects | Not Significant | Negative Effects |
|---|---|---|---|
| **Other Possible Mediating Behaviors** | | | |
| Using alcohol or drugs | 3 | 7 | |
| Using alcohol or drugs before sex | | 4 | |
| Having a boyfriend or girlfriend | | 1 | |
| Engaging in coercive behavior | | 1 | |
| Avoiding places and situations that could lead to sex (including pre-coital sexual activities) | 3 | 1 | |
| Avoiding unwanted sexual advances | 1 | | |
| Obtaining and carrying a condom | 1 | 1 | |
| Putting a condom on partner (girls only) | 1 | | |
| Being tested for STD | | 1 | |
| Being tested for HIV | | 2 | |
| Future orientation | 1 | 1 | |
| **Relationship with Parents** | | | |
| Relationship with parents | 1 | | |
| Relevance of parents' concern about sex | 1 | | |
| Perceived parental concern or values about having sex and using condoms | 1 | 1 | |
| **Psychological States** | | | |
| Self-esteem | | 1 | |
| Depression and mental health | | 1 | |
| Concern about health | | 1 | |

engaging in same-sex behavior; some had problems with implementation; a few had relatively weak, quasi-experimental designs; an unknown number had measurement problems; many lacked statistical power; most did not adjust for multiple tests of significance; many did not adjust for clustering; few measured impact on either STD or pregnancy rates; and still fewer measured impact on STD or pregnancy rates with laboratory tests. Moreover, inherent biases affect the publication of studies—researchers are more likely to try to publish articles if the results support their theories and programs, and journals are more likely to accept articles for publication if results are positive. Fortunately, some of these biases counteract each other.

Despite these limitations, the large number of studies and the widespread use of experimental designs produced strong and encouraging evidence that curriculum-based sex and STD/HIV education programs have a positive impact on behavior. Specifically:

☆ Of the 56 studies reviewed, almost two-thirds of the programs they examined had a significant positive impact on the behavior of either the entire sample or important subgroups of the sample.

☆ Several abstinence programs, including abstinence-until-marriage programs, have been *rigorously* evaluated with large experimental designs and found to have no overall impact on delay in initiation of sex, age of initiation of sex, return to abstinence, number of sexual partners, or condom or contraceptive use.

☆ A few other abstinence programs have been evaluated less rigorously with smaller, quasi-experimental designs, and those results suggest that two of the programs may have had some positive effects on sexual behavior. One program appeared to delay the initiation of sex among middle school students and to decrease current sexual activity. However, a study with a more experimental rigorous designed failed to find these positive results. A second program appeared to decrease the frequency of sex and reduce the number of sexual partners. Overall, two of eight studies found some positive effects on behavior.

☆ At present, there is no strong evidence that any abstinence program is effective in delaying sex.

☆ The abstinence programs evaluated thus far did not appear to have any significant negative effects on behavior. In particular, they did not appear to hasten or increase sexual behavior or to decrease condom or other contraceptive use.

☆ Although abstinence programs have yielded discouraging results, one should not conclude that all such programs are ineffective at delaying sex. There are a great many abstinence programs and many of them have not been evaluated.

☆ On the other hand, studies of abstinence programs have not produced sufficient evidence to justify their widespread dissemination. More effort should be directed toward carefully developing and evaluating these programs. When strong evidence demonstrates that particular programs are effective, those programs should then be disseminated more widely.

☆ Communities choosing to implement abstinence programs might consider the two programs that have produced modest positive effects on behavior. Moreover, they may find that programs with stronger evidence of impact have become available after this review was published. Communities might also consider selecting abstinence programs that incorporate known characteristics of effective programs (see Chapter 7 and Chapter 10).

☆ Comprehensive programs, in contrast, show strong evidence of positive effects on behavior and no significant negative effects. Two-thirds of comprehensive curriculum-based sex and STD/HIV education programs delayed the initiation of sex, reduced the frequency of sex, reduced the number of sexual partners, increased condom use, increased contraceptive use, or reduced risky sexual behavior. Nearly two-fifths of the programs

had positive effects on two or more types of behavior.

- ☆ Comprehensive programs that emphasized condom and contraceptive use and taught young people how to insist on their use and where to obtain them, while also supporting abstinence, did not increase any measure of sexual behavior. That is, they did not have any of the negative effects on sexual behavior that some people fear.
- ☆ Studies clearly demonstrate that the same programs can both delay sex and increase use of condoms or other forms of contraception. In other words, emphasizing abstinence and the use of protection for those who do have sex in the same program is not confusing to young people; rather, it is realistic and effective.
- ☆ Most programs improved protective factors known to be related to sexual behavior (e.g., knowledge, attitudes, self-efficacy, and intentions). Studies of these psychosocial factors help explain how and why programs are effective.
- ☆ Some programs reduced one or more measures of sexual risk by one-third to one-half, yet reduced other measures by much less. Such programs may reduce overall sexual risk by roughly one-third or less.
- ☆ Effects of some programs were found to last for several years, but most studies failed to measure impact for that long.
- ☆ Study findings were quite robust. They indicated that some programs were effective in both urban and rural areas, low- and middle-income communities, and school and community settings, for advantaged and disadvantaged youths, for both sexes, different racial and ethnic groups, younger and older age groups, and sexually experienced and inexperienced young people. Programs appeared to be especially effective with teens who were most likely to engage in unprotected sex with multiple partners and thus were at highest risk of HIV, other STDs, and pregnancy. No single program was implemented for all of these groups; rather, programs were designed for or tailored to various groups.
- ☆ Robustness was also demonstrated by studies of replication. When three programs were replicated with fidelity in different locations throughout the United States, but in the same type of setting, the original positive effects were confirmed. This is very encouraging and suggests that effective programs can remain effective when they are implemented with fidelity by other people in other communities with similar groups of young people.
- ☆ Given that many programs reduced sexual behavior and/or increased condom or contraceptive use, they might logically be expected to reduce rates of both STDs and pregnancy. The results of the few studies that measured impact on STD or pregnancy rates were mixed, but somewhat encouraging. The lack of more consistent positive effects may have been caused, in part, by small samples, negative biases in self-reported STD rates, other methodological limitations, significant changes in behavior that were too small or too short-term to produce marked changes in STD or pregnancy rates, and failure to change those behaviors that have the strongest impact on STD or pregnancy rates.
- ☆ While education programs alone cannot stop the spread of STDs and HIV or prevent unintended pregnancy, many of them can change sexual behavior and protective factors in desired directions and thereby contribute to reductions in pregnancy and STD rates. Moreover, they can be an important component of larger, more comprehensive initiatives.

☆ ☆ ☆

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- ☆ Effective curriculum-based sex and STD/HIV education programs have 17 characteristics in common. These characteristics fall into three categories: development of the curriculum, content of the curriculum, and implementation of the curriculum.
- ☆ Most programs with these 17 characteristics were effective; most effective programs incorporated most of these characteristics; and programs with these characteristics were more effective than programs without these characteristics.

# Important Characteristics of Effective Curriculum-Based Sex and STD/HIV Education Programs

About two-thirds of the curriculum-based sex and STD/HIV education programs reviewed in Chapter 6 had a positive impact on sexual behavior. This finding does not mean that the remaining programs had a negative effect: rather, they typically failed to have any significant impact at all. Why were some programs successful and others not? Specifically, what characteristics of the successful programs contributed to their effectiveness? The answer can help people develop more effective curricula from scratch, select more effective existing curricula for implementation, and adapt and improve curricula.

## METHODS USED TO IDENTIFY CHARACTERISTICS OF EFFECTIVE PROGRAMS

Four steps were used to identify the characteristics that contributed to the success of effective programs. First, to generate a comprehensive list of *potentially* important characteristics, this review looked at previous reviews of health education and STD/HIV education programs for adults, reviews of sex and HIV education programs for young adults, and individual studies of sex and STD/HIV education programs for young people. The resulting list included a variety of potentially important characteristics suggested by theory, individual studies, and meta-analyses (statistical analyses that integrate the results of many individual studies).

Second, to identify the common characteristics of effective curriculum *content* (as opposed to curriculum *development* and *implementation*), this review looked for programs with the strongest evidence of positive effects on sexual behavior. Twenty-eight such programs were found, and curricula for 19 of them were obtained and reviewed. (Because the identification of these characteristics was completed as part of another review with slightly different criteria for inclusion, five of the 19 programs are from other countries.) Evidence of the effects of the remaining programs was less strong—either the results were not significant or the study design or results were more equivocal. The individual activities and overall qualities of the effective curricula were then coded according to whether or not they incorporated each of the potentially important characteristics. Characteristics that appeared in more than 80 percent of the effective curricula became the eight common characteristics of effective curriculum content described below.

A third step was then needed. Besides claiming that the eight common characteristics contribute to effectiveness, it was important to demonstrate that they were less likely to be incorporated in *ineffective* curricula. A review of ineffective curricula included both those that had been implemented as the intervention curriculum in a randomized trial and failed to change behavior and those that served as the comparison curriculum in a randomized trial and were demonstrated to be less effective than the intervention curriculum. These ineffective programs incorporated fewer of the characteristics common to the effective programs. Some lacked only a couple of critical characteristics (e.g., a clear message

about behavior), while others lacked many of the common characteristics.

Fourth, the common characteristics of *developing* and *implementing* effective curricula were identified by reviewing the original research articles and any other materials that described how curricula were developed and implemented. The review also covered reports of curricula that were not implemented successfully. All of these descriptions became the basis for the five characteristics of developing an effective curriculum and the four characteristics of implementing an effective curriculum.

The curricula and the studies of them were coded as objectively as possible. Nevertheless, the results had to reflect some degree of judgment, in part because many studies lacked a clear and detailed description of program content, development, and implementation.

Several types of evidence indicate strongly that the characteristics described below contributed to the success of the effective programs. First, a large majority of the effective programs shared most of the characteristics. Second, programs that incorporated the characteristics were highly likely to change behavior, while programs that did not incorporate many of the characteristics were less likely to change behavior. Third, several studies compared the impact of skill-based curricula that incorporated all (or nearly all) of the characteristics with the impact of knowledge-based curricula that incorporated only a few of the characteristics. The skill-based programs were consistently more effective at changing behavior than the knowledge-based programs [1; 2].

Although nearly all of the effective curricula incorporated nearly all of the effective characteristics, and although curricula with nearly all of the characteristics were highly likely to be effective, simply having most of the common characteristics did not ensure that a curriculum would bring about significant changes in reported behavior. The reason may be, in part, because the studies had methodological limitations, such as insufficient sample sizes.

A few curricula that did not appear to incorporate most of the common characteristics nevertheless had a positive impact, perhaps because they were poorly written (e.g., were simply broad outlines) and did not capture well what really happened in the classroom. In addition, some seemingly weak programs (as well as some strong programs) may have had significant positive effects simply by chance, because of the large number of significance tests conducted.

Factors other than program characteristics also affected success. For example, the saliency of unintended teen pregnancy and STD/HIV in the community, the availability of other school and community programs for teens, the needs and assets of participating teens, and other factors undoubtedly contributed to whether or not a curriculum-based program significantly affected sexual behavior.

## COMMON CHARACTERISTICS OF EFFECTIVE CURRICULUM-BASED PROGRAMS

Analysis of the 19 effective curricula revealed 17 common characteristics that fall logically into three categories: the process of developing the curriculum, the overall design and teaching strategies of the curriculum itself, and the process of implementing the curriculum. The 17 characteristics are described more fully elsewhere [3; 4] but are presented in Table 7-1 and briefly discussed here. A tool to assess whether or not curricula incorporate these characteristics has also been developed [3].

### Development of the Curriculum

Effective curriculum development teams and their efforts to develop effective curricula shared five characteristics. These teams:

*1. Included multiple people with expertise in different areas*

Teams often included people with backgrounds in areas such as health behavior theory, adolescent sexual behavior, risk and protective factors

Table 7-1: Characteristics of Effective Curriculum-Based Programs

| THE PROCESS OF DEVELOPING THE CURRICULUM | THE CONTENTS OF THE CURRICULUM ITSELF | THE PROCESS OF IMPLEMENTING THE CURRICULUM |
|---|---|---|
| 1. Involved multiple people with expertise in theory, research, and sex and STD/HIV education to develop the curriculum | **CURRICULUM GOALS AND OBJECTIVES** | 14. Secured at least minimal support from appropriate authorities, such as departments of health, school districts, or community organizations |
| 2. Assessed relevant needs and assets of the target group | 6. Focused on clear health goals—the prevention of STD/HIV, pregnancy, or both | 15. Selected educators with desired characteristics (whenever possible), trained them, and provided monitoring, supervision, and support |
| 3. Used a logic model approach that specified the health goals, the types of behavior affecting those goals, the risk and protective factors affecting those types of behavior, and activities to change those risk and protective factors | 7. Focused narrowly on specific types of behavior leading to these health goals (e.g., abstaining from sex or using condoms or other contraceptives), gave clear messages about these types of behavior, and addressed situations that might lead to them and how to avoid them | 16. If needed, implemented activities to recruit and retain teens and overcome barriers to their involvement (e.g., publicized the program, offered food or obtained consent) |
| 4. Designed activities consistent with community values and available resources (e.g., staff time, staff skills, facility space and supplies) | 8. Addressed sexual psychosocial risk and protective factors that affect sexual behavior (e.g., knowledge, perceived risks, values, attitudes, perceived norms, and self-efficacy) and changed them | 17. Implemented virtually all activities with reasonable fidelity |
| 5. Pilot-tested the program | **ACTIVITIES AND TEACHING METHODOLOGIES** | |
| | 9. Created a safe social environment for young people to participate | |
| | 10. Included multiple activities to change each of the targeted risk and protective factors | |
| | 11. Employed instructionally sound teaching methods that actively involved participants, that helped them personalize the information, and that were designed to change the targeted risk and protective factors | |
| | 12. Employed activities, instructional methods, and behavioral messages that were appropriate to the teens' culture, developmental age, and sexual experience | |
| | 13. Covered topics in a logical sequence | |

affecting that behavior, theory of instructional design, specific activities used to teach young people about sexual topics, experience teaching sex or HIV education, cultural knowledge, and evaluation.

*2. Assessed the needs and assets of the young people they were targeting*

Curriculum developers typically reviewed quantitative data on rates of HIV, other STDs, and pregnancy, as well as adolescent sexual behavior. These data helped them determine which health goals to focus upon and which types of behavior to address and at what grade levels. Curriculum developers often conducted focus groups or interviews with young people and adults working with young people on reproductive health concerns. They often tried to learn why teens engaged in risky sexual behavior and what specific risk and protective factors prevented protective behavior or encouraged risk behavior (e.g., what specific beliefs, attitudes or skills should be changed). They also tried to determine what needed to be done to change those types of behavior and what situations led to unwanted sex or unprotected sex.

*3. Used a logic model approach*

In published materials, discussions of the development of the curriculum, the use of theory, and the measurement of sexual and contraceptive behavior and the risk and protective factors affecting such behavior all suggest that, consciously or unconsciously, the teams used a logic model that 1) specified health goals, 2) identified behavior that affects those goals, 3) identified factors that affect the behavior, and 4) developed activities to change the factors.

The curriculum development teams used theory to develop their logic models. In particular, they often used health and sociopsychological theories (social cognitive theory, the theory of planned behavior, the health belief model, and other theories) to identify the important mediating factors (e.g., knowledge, attitudes, perception of norms, self-efficacy, and intentions) that in turn affect behavior. Sometimes they also used instructional theory to determine what types of activities would produce positive change in the mediating factors.

*4. Designed activities consistent with community values and available resources*

In communities that valued abstinence highly, for example, teams developed a curriculum that emphasized abstinence as the safest or best approach for young people. Teams also took into account community resources such as facility availability, staff availability, staff skills, supplies, and time. For example, in communities that lacked video equipment, teams did not design curricula that incorporate videos or films.

*5. Conducted pilot tests on some or all activities*

Many curriculum developers pilot-tested some or all of the activities and modified them before implementing the version of the curriculum that was eventually evaluated.

## Content of the Curriculum

The content of effective curricula had eight common characteristics. Some of them described the goals and objectives of the curriculum, and others described the activities and teaching methods.

Three characteristics describe the goals and objectives of effective curricula:

*6. Focused on at least one of three health goals: the prevention of HIV, the prevention of other STDs, the prevention of unintended pregnancy*

The curricula typically focused on young people's susceptibility to HIV, other STDs, pregnancy, or some combination of these and the negative consequences of disease and unintended pregnancy. They sent a clear message about health goals and tried to motivate young people to avoid STDs and unintended pregnancy.

*7. Focused narrowly on the specific types of behavior that cause or prevent HIV, other STDs, or pregnancy and gave clear messages about them*

This is a particularly important characteristic. *Effective curricula repeated clear and consistent messages about sexual and protective behavior.* They talked explicitly about sex or condom use, identified specific situations that might lead to unwanted sex or unprotected sex, discussed how to avoid or get out of such situations, and practiced saying no to sex or insisting on condom or contraceptive use. They also described how to use condoms or contraceptives correctly and how to overcome barriers to obtaining and using them.

The messages were appropriate to the age, sexual experience, gender, and culture of the young people targeted by the program. For example, programs designed for younger adolescents, who were less likely to be sexually experienced were more likely to place greater emphasis on abstinence than on condom use, while programs designed for older, more sexually experienced adolescents were more likely to place greater emphasis on condom use.

*8. Focused on specific sexual psychosocial factors that affect the specified types of behavior and changed some of those factors*

In the original studies, these risk and protective factors were chosen in part by theory and in part by research on factors affecting adolescent sexual behavior.

At least three programs that *reduced sexual activity* and at least three programs that *increased condom use* focused on and improved each of the following factors:

- ☆ Knowledge, including knowledge of sexual issues, HIV, other STDs, and pregnancy (including methods of prevention).
- ☆ Perception of HIV risk.
- ☆ Personal values about sex and abstinence.
- ☆ Attitudes toward condoms (including perceived barriers to their use).
- ☆ Perception of peer norms and behavior about sex.
- ☆ Confidence in the ability to refuse sex and to use condoms.
- ☆ Intention to abstain from sex or to restrict frequency of sex or number of partners.
- ☆ Communication with parents or other adults about sex, condoms, or contraception.

In addition, at least three programs that *reduced sexual activity* focused on and improved:

- ☆ Confidence in their ability to avoid STD/HIV risk and risky behavior.
- ☆ Actual avoidance of places and situations that might lead to sex.

And at least three programs that *increased condom use* focused on and improved:

- ☆ Intention to use a condom.

Five characteristics describe the activities and teaching methods of effective curricula:

*9. Created a safe environment*

Virtually all of the effective programs started by creating a set of ground rules for class involvement, such as not asking personal questions and respecting the opinions of others. Some programs tried to create a safe environment by separating the class into same-sex groups for certain topics, or occasionally by limiting the entire course to only one sex.

*10. Included multiple instructionally sound activities to change each of the targeted risk and protective factors*

To increase knowledge about topics such as modes of transmission of HIV and other STDs, symptoms of STDs, susceptibility to and consequences of STDs, and methods of preventing STDs and pregnancy, the curricula included short lectures, class discussions, competitive games, simulations, skits, videos, and other techniques. Notably, many of these activities required that

students obtain and share information rather than passively listen to the educators and these activities encouraged students to personalize the information.

To increase perceptions of risk (both susceptibility and severity), effective curricula provided data on incidence of STDs and pregnancy, videos of HIV-positive or pregnant teens, HIV-positive or pregnant speakers, and simulations demonstrating STD or pregnancy risk and consequences.

To change personal values and attitudes about sex and the use of condoms or other contraceptives, effective curricula included group discussions that emphasized the advantages of abstinence or condom/contraceptive use, voting activities and survey data to demonstrate peer support for abstinence or condom use, methods of resisting lines to pressure someone to have sex, and so on.

To teach students how to refuse unwanted, unintended, or unprotected sex or to insist on using condoms or contraception, effective curricula commonly used role-playing. Each teen had multiple opportunities to practice important verbal skills.

To increase self-efficacy to use condoms, some curricula demonstrated how to use condoms and had students temporally order the steps for using condoms that were written on 3 x 5 cards.

*11. Employed instructionally sound teaching methods that actively involved the participants, that helped participants personalize the information, and that were designed to change specific risk and protective factors.*

The following interactive teaching methods were most commonly implemented: short lectures, class discussions, small group work, video presentations, stories, live skits, role-playing, simulations of risk, competitive games, forced-choice activities, surveys of attitudes and intentions with anonymous presentation of results, problem-solving activities, worksheets, homework assignments (including assignments to talk with parents or other adults), question boxes, and condom demonstrations.

*12. Employed activities, instructional methods, and behavioral messages that were appropriate to the adolescents' culture, developmental age, and sexual experience*

Some curricula were designed for specific racial or ethnic groups and emphasized the high rates of HIV, other STDs, or pregnancy among those groups. Some curricula were designed specifically for girls and emphasized that they can be powerful and in control in sexual situations. Programs for younger, less sexually experienced adolescents focused more on abstinence, while those for older, more sexually experienced adolescents focused more on condoms.

*13. Covered topics in a logical sequence*

Effective curricula often presented topics in the following order: basic information about HIV and other STDs or pregnancy, including susceptibility and severity; behavior that will reduce vulnerability; knowledge, values, attitudes, and barriers surrounding protective behavior; and skills needed to adopt protective behavior. Thus, the curricula first enhanced teens' motivation to avoid STDs and pregnancy and then addressed the knowledge, attitudes, and skills needed to avoid them.

### Implementation of the Curriculum

Effective programs shared four characteristics in implementing their curricula; they:

*14. Secured at least minimal support from appropriate authorities*

Virtually all of the effective programs obtained approval from authorities such as school principals, district superintendents, or directors of local youth-based organizations. This approval may have provided needed support or sanction for educators who were covering topics that were controversial in some cultures; it was certainly needed to conduct the research.

*15. Selected educators with desired characteristics (whenever possible), trained them, and provided monitoring, supervision, and support*

While some programs were implemented by classroom teachers, other programs hired their own educators. Usually, they hired people who they believed could relate to young people and who had a background in health education, especially sex or HIV education. Although most studies did not examine the impact of the characteristics of the educators on changes in behavior, results from five studies indicate that neither the age (adult versus peer) nor the gender nor the race of the educator is important—the ability of the educator to relate to young people is what makes a difference. Virtually all of the programs trained their educators in the implementation of the curriculum.

*16. Implemented activities to recruit and retain adolescents*

If needed, effective programs implemented activities necessary to recruit young people and avoided or overcame obstacles to their participation (e.g., they informed teens about the program, provided food and/or other incentives, ensured that parents were notified, provided transportation, implemented activities at convenient times, and ensured the teens' safety). If the programs were implemented in school classrooms, then support from appropriate authorities was needed; in such cases, presumably, additional recruitment activities were not needed.

*17. Implemented curricula with reasonable fidelity*

Most of the effective programs implemented all or nearly all of the activities in the curriculum. This was in part because the programs were being evaluated.

## CONCLUSIONS

☆ Seventeen characteristics of effective programs, in addition to the needs and assets of participating teens, the saliency of unintended teen pregnancy and STD/HIV in their communities, and other school and community programs, all affect whether or not the programs have a significant impact on sexual behavior.

☆ The 17 characteristics describe the development of the curriculum, the content of the curriculum, and the implementation of the curriculum. They also provide a better understanding of how effective programs worked—that is, what kinds of activities affected which risk and protective factors, which in turn contributed to change in one or more types of sexual behavior.

☆ Nearly all effective programs incorporated these characteristics, nearly all programs with these characteristics were effective, and randomized trials demonstrated that programs with these characteristics were more likely to be effective than programs without them.

☆ The first two categories of the characteristics (characteristics 1-13) can be used to select programs that are likely to be effective, to adapt programs that have been selected in order to increase their effectiveness, or to develop new curricula from scratch. The third group of characteristics (characteristics 14-17) can be used to guide implementation of effective curricula.

☆ ☆ ☆

*References*


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1 2 3 4 5 6 7 **8** 9 10

- ☆ Too few studies have been done to reach firm conclusions about programs that involve parents, but some evidence suggests that they reduced sexual risk-taking among teens, especially if the teens themselves were actively involved.
- ☆ Longer, interactive videos or computer-based programs that teens viewed multiple times sometimes had an impact on some types of sexual behavior.
- ☆ Large numbers of young people have obtained contraceptives from family planning clinics and other providers, presumably preventing many teen pregnancies each year. However, the long-term impact of family planning services on sexual behavior and pregnancy has not been accurately estimated.
- ☆ Brief clinic protocols that provided young people with information about abstinence and contraception did not typically increase sexual activity but did consistently increase the use of contraception.
- ☆ Teens who were given emergency contraception in advance of sexual activity were more likely to use it than those who were not. However, pregnancy rates did not differ significantly, perhaps because sample sizes were too small.
- ☆ School-based and school-linked clinics and school condom-availability programs did not increase sexual activity, but it is not clear whether they increased condom or other contraceptive use.
- ☆ Four of six community-wide programs had a significant impact on one or more of the following: delaying sex, improving contraceptive use, or lowering pregnancy and birth rates. Even programs that focused primarily on contraceptive use did not hasten or increase sexual activity.
- ☆ Welfare reform requirements for adults—namely, regulations that required parents to work or participate in activities to increase their employability, earning supplements that provided extra income to parents who were or voluntarily became employed, and time limits on receipt of cash assistance that encouraged parents to leave welfare rolls—all failed to have any impact on adolescent childbearing.
- ☆ Some youth development programs reduced teen pregnancy but others did not. It is not clear why service learning programs had a positive impact while vocational education programs, which have some similar characteristics, did not.
- ☆ Some programs that have multiple components addressing sexual and nonsexual risk and protective factors had a positive effect on sexual behavior.
- ☆ Strong evidence indicates that one such program, the *CAS-Carrera program,* reduced pregnancy in its six New York City sites for three years. The program was intensive, lasted throughout high school, included multiple components, created close connections between girls and the staff, gave a very clear message about avoiding pregnancy, and improved access to reproductive health services. When others attempted to replicate it outside of New York City, however, the program was not always effective at changing behavior.

# Effects of Other Types of Programs

Some programs designed to prevent teen pregnancy and STD/HIV focus primarily on sexual risk and protective factors, others focus on nonsexual factors, and still others focus on both sexual and nonsexual factors (see Box 4-1). Chapter 6 summarized 56 studies of curriculum-based sex and STD/HIV education programs, the most prevalent and widely studied type of preventive program. This chapter focuses on the remaining types of programs that focus on sexual risk and protective factors, as well as those that focus on nonsexual factors and on combined factors. Far fewer of these programs have been evaluated, so each study is summarized here.

## ADDITIONAL PROGRAMS THAT FOCUS ON SEXUAL RISK AND PROTECTIVE FACTORS

### Sex and STD/HIV Education Programs for Parents and Their Teens

Most parents and their teenage children have remarkably few conversations about sexual topics, often because both parents and teens feel uncomfortable doing so. To help alleviate this problem, many educational programs have been designed to increase parent-child communication, including programs for parents only, programs for parents and teens together, homework assignments in school sex education classes requiring communication with parents, and video programs with written materials to be completed at home.

Many studies indicate that few parents are willing or able to participate in special parent programs and that getting them to enroll in such programs presents a challenge. However, studies consistently indicate that when parents do participate, they increase both communication with their teens about sexuality in the short term and their own comfort with that communication [1]. However, those positive effects on communication seem to dissipate with time.

Because there is no simple relationship between parent-child communication and adolescent sexual and contraceptive behavior, it is not sufficient simply to examine the impact of programs on communication. Studies must also examine the effects on sexual behavior. Only seven studies have done so (see Table 8-1).

The first of these evaluated a program implemented by Girls Inc. (formerly Girls Clubs) that included five two-hour sessions for mothers and daughters [2]. Although the intervention group appeared less likely to initiate intercourse, the result was not statistically significant, and the intervention and comparison groups were probably not equivalent from the outset.

The second study used a clustered, randomized design to measure the impact of two programs conducted within the Boys and Girls Clubs [3]. Both programs were intensive—they included seven sessions of two hours each for mothers and their adolescent sons and daughters. In some of the sessions, mothers, sons, and daughters were in the same group; in others

**Table 8-1: Programs for Parents and Their Teens—Number of Studies Reporting Effects on Sexual Behavior and Outcomes**

| Outcome Measured | Parent-Teen Programs (N=7) |
|---|---|
| **Delay Sex** | (N=5) |
| Delayed Initiation | 1 |
| No Significant Results | 4 |
| Hastened Initiation | 0 |
| **Reduce Frequency of Sex** | (N=1) |
| Reduced Frequency | 1 |
| No Significant Results | 0 |
| Increased Frequency | 0 |
| **Increase Condom Use** | (N=4) |
| Increased Use | 4 |
| No Significant Results | 0 |
| Reduced Use | 0 |
| **Increase Contraceptive Use** | (N=1) |
| Increased Use | 0 |
| No Significant Results | 1 |
| Reduced Use | 0 |
| **Reduce Sexual Risk-Taking** | (N=2) |
| Reduced Risk | 0 |
| No Significant Results | 2 |
| Increased Risk | 0 |
| **Reduce Pregnancy: Self-Report** | (N=1) |
| Reduced Number | 1 |
| No Significant Results | 0 |
| Increased Number | 0 |
| **Reduce STDs: Self-Report** | (N=1) |
| Reduced Number | 1 |
| No Significant Results | 0 |
| Increased Number | 0 |

they were not. Both of the programs included the kinds of activities that have been found to be effective in programs for adolescents alone—for example, they were interactive and skills-based. One of the programs focused primarily on HIV and its prevention, while the other focused much more broadly on a variety of risky behaviors. The comparison group met relatively briefly. Neither program had a significant impact on abstinence, but both programs did increase condom use.

The third study was very similar to the second in that it evaluated a Boys and Girls Clubs program and used an experimental design [4]. However, this program involved fathers (or father figures) instead of mothers, and the fathers attended six sessions alone and the seventh session with their sons. The program appeared to delay the initiation of sex at the six-month follow-up and to reduce sex without a condom at the three- and 12-month follow-ups.

The fourth study used an experimental design to measure the impact of a 49-hour program for Hispanic parents that included parental monitoring, good parenting practices, topics related to HIV, and other topics [5]. Results indicated that the program reduced unprotected sex and STDs among teens whose parents participated in the study.

The fifth study used an experimental design to measure the impact of a lengthy (11- week, 22-hour) abstinence-until-marriage program for parents [6]. Results showed that the program failed to delay the initiation of sex among the teens of participating parents.

Parenthetically, it should be noted that another intensive program for mothers and daughters also found an impact on the sexual behavior of adolescent girls [7]. This study used a clustered, experimental design, but it measured impact for only two months, not three, and thus does not meet the criteria for inclusion in this review. Mothers were trained during six two-hour sessions to teach a course of the same length to their own daughters. Thus, the program was about twice as long for the mothers as for their daughters. The program for the daughters was found to

be equally effective when taught by their mothers (the first intervention group) and by health experts (the second intervention group). This finding suggests that the content of the program, not communication with the mother, brought about the change in behavior. The content of the program for adolescent daughters may have included some of the characteristics of effective curriculum-based programs for teens.

Recognizing that it is typically very difficult to get parents to participate in multi-session programs in the community, some programs are implemented in the parents' own homes. Two studies examined such programs. The first used a rigorous experimental design to measure the impact of well-designed video and written materials to be used at home [8]. The program increased parent-child communication but failed to delay the onset of intercourse significantly, in part because the teens were young, they lived in a conservative community, and very few of them in either the intervention or the comparison group initiated sex.

The second study measured the impact of adding a program designed to increase parental monitoring to an already effective curriculum for adolescents alone [9]. The in-home program for parents was short. It included a 20-minute video emphasizing parental monitoring and communication about sex, two instructor-led role–playing activities that involved parents and teens, and a condom demonstration. At six months, but not at 12 months, the teens whose parents had received the in-home program were less likely to have had sex and less likely to have had unprotected sex. At 24 months, no significant differences were found in the percentages of teens engaging in sex, using condoms, or using other forms of contraception [10]. The pregnancy rate was reduced significantly; however, that reduction was not consistent with the long-term lack of effects on sexual or contraceptive behavior, and it was not found in another intervention group that received both the parent component and a booster component for the teens. The study conducted many tests of significance, so the lower pregnancy rate may have occurred by chance.

Overall, these results are somewhat encouraging, particularly regarding condom use. While only one of five programs succeeded in delaying the initiation of sex, and one reduced the frequency of sex, all of the four studies that measured impact on condom use found a significant increase. Furthermore, two studies that failed to find significant results may have had methodological limitations that contributed to their lack of significant findings. Notably, the programs that included rather intensive programs for adolescents as well as their parents were especially likely to be effective. This result is not surprising, because the programs might have been effective for adolescents even without the parental component. Finally, two of the studies suggest that increasing parental involvement and monitoring may have a positive impact on teen sexual behavior. While two studies are not enough to demonstrate the effectiveness of an approach, multiple other studies have shown that parental involvement and monitoring do affect adolescents' sexual risk-taking.

*Conclusions about the impact of programs for parents and their teens*

Too few studies have been conducted to warrant firm conclusions, but the studies do suggest the following:

- ☆ Programs for parents and their teens sometimes reduce sexual risk-taking, particularly by increasing condom use. Programs are especially effective when they include educational components for the teens that incorporate many of the 17 characteristics of effective curriculum-based programs for youth (see Chapter 7).
- ☆ Programs to increase parental involvement and monitoring may have a positive impact, but the evidence is still weak.

### Stand-Alone Video- and Computer-Based Programs

For decades videos have been used in facilitator-led group sessions, either to provide accurate information or to serve as "teasers" to generate

group discussion. But rapid changes in media and computer technology during the last decade have spurred the development of stand-alone video and computer programs.

These programs eliminate the need for facilitator-led group sessions and can be implemented nearly anywhere the necessary video or computer equipment is available, whether in classrooms, health clinics, or adolescents' own homes. Once developed, the programs can be disseminated at relatively little cost. Although teens have some control over how they view interactive videos or computer programs, the basic programs can be replicated with fidelity.

Because most young people, even disadvantaged young people, are familiar and completely comfortable with interactive technology, interactive videos and computer programs hold considerable potential for reaching teens. Previous studies have shown that educational material in general can be taught on interactive computers. Some studies have indicated that interactive video and computer programs can improve knowledge and attitudes, even about sexuality [11; 12].

On the other hand, to the extent that interactive videos are viewed individually by young people, they do not facilitate group activities, such as role-playing, that may change perceptions of peer norms and teach skills. The crucial question is, can videos actually change sexual behavior?

Three studies have measured the impact of videos, interactive videos, or computer-based programs on behavior (Table 8-2). The first compared the relative effects of STD/HIV material presented in a 14-minute, noninteractive videotape in an STD clinic, the same material presented by a health educator in the clinic, and standard clinic care [13]. The videotape included a number of qualities to enhance its success. For example, it was based on both theory and research in the community. It used dialogue, music, images, and stories that would appeal to adolescents. It was made by people in the target group (African-American males). It was designed to elicit social responsibility with the message

**Table 8-2: Stand-Alone Video- and Computer-Based Programs—Number of Studies Reporting Effects on Sexual Behavior and Outcomes**

| Outcome Measured | All Programs (N=3) |
|---|---|
| **Reduce Frequency of Sex** | (N=3) |
| Reduced Frequency | 2 |
| No Significant Results | 1 |
| Increased Frequency | 0 |
| **Reduce Number of Partners** | (N=2) |
| Reduced Number | 1 |
| No Significant Results | 1 |
| Increased Number | 0 |
| **Increase Condom Use** | (N=3) |
| Increased Use | 0 |
| No Significant Results | 3 |
| Reduced Use | 0 |
| **Reduce Sexual Risk-Taking** | (N=1) |
| Reduced Risk | 0 |
| No Significant Results | 1 |
| Increased Risk | 0 |
| **Reduce STDs: Self-Report** | (N=1) |
| Reduced Number | 1 |
| No Significant Results | 0 |
| Increased Number | 0 |

"We got to keep the brothers alive." It was also designed to increase perceived risk of STD/HIV and to improve perceptions of peer norms about condom use. It modeled African-American teens discussing condoms and proper methods for using them. Finally, it presented information in an authoritative manner. Despite all of these important qualities, the videotape was too modest an intervention to have a significant impact on behavior. It was short, and it was not interactive.

The second study examined the impact of a stand-alone interactive video in health care sites [14]. The video included a section on sexual situations (negotiation behavior to reduce STD risk), risk reduction (condom efficacy, getting and using condoms), reproductive health (pelvic exams,

female anatomy, physiological responses to infections), and STDs (general information on viral and bacterial disease and information on eight specific diseases). The video presented vignettes, explicit choice points, and alternative types of behavior. Thus, it was interactive in two ways: users could choose which sections to watch and which types of behavior the actors should engage in. Users performed cognitive rehearsals, imagining what they would say or do, and then practiced in their heads while the video froze for 30 seconds. Overall, patients spent about 30 minutes with the video during the first visit and at least 15 minutes both three and six months later. The study used an experimental design to compare the impact of the stand-alone video with the impact of the same content in book form or in brochures. Results over six months indicated that the video reduced the percentage of girls who had sex during the first three months after first exposure to the video. It also reduced the reported STD rate at six months.

The last of the three studies compared the relative effects in alternative schools of a computerized program based on *Project LIGHT (Living in Good Health Together)*, a program offering instruction in small groups, and a comparison group [15]. At three months, students participating in the computerized program were less likely to have had sex the previous three months than students receiving instruction in the small groups. Students in the program group also had fewer sexual partners than students in the comparison group. While encouraging, the strength of these results is limited by a weak, quasi-experimental, short-term design.

Parenthetically, two programs that did not meet the criteria for inclusion in this review are worth noting. A six-session computer-based program completed online appeared to delay the initiation of sex and possibly reduce the number of sexual partners (p=.055) [16]. However, evaluation of the program measured impact for only five months.

Another computer-based interactive program, designed for college students [17], was based on the information-motivation-behavioral skills model of health behavior change and on motivational interviewing. A randomized trial that measured the program's impact for one month found that it increased condom use during that month.

Video-based programs have also been found to be effective with adults. For example, one video-based program located in an STD clinic provided information about STDs and their prevention, portrayed positive attitudes about condom use, and modeled appropriate situations for condom use [18]. After an average of 17 months, the intervention group had a lower STD rate than the comparison group.

*Conclusions about the impact of stand-alone video- and computer-based instruction*

Too few studies, especially involving adolescents, have been done to warrant drawing any strong conclusions. However, studies suggest the following:

- ☆ Short, noninteractive videos alone may not have any effect on behavior. However, longer, interactive videos that are viewed several times may have an impact on some behavior, possibly for as long as six months.

### Clinic-Based Programs

Clinic-based programs are designed to provide teens with reproductive health care or to improve access to condoms or other contraceptives. This section summarizes studies of four types of clinic-based programs: family planning services; detailed plans, or protocols, for clinic appointments and supportive services; advance provision of emergency contraception; and other clinic characteristics and programs.

*Family planning services*

The primary objective of family planning clinics (or family planning services offered within other health settings) is to provide clients with contraception and other reproductive health services and with the knowledge and skills to use them. A 1995

national survey of publicly funded family planning agencies found that these agencies typically provided special services for teens [19]. About 87 percent of them encouraged counselors to spend more time with teenagers than with other clients, and 69 percent had at least one special program serving teens. Programs for teens included special clinics, offered by 30 percent of the agencies surveyed, and education or outreach in schools or youth centers, provided by 49 percent.

A 2003 national survey of publicly funded family planning clinics found that 91 percent of clinics counsel teens under 18 about abstinence, and 89 percent encourage teens under 18 to discuss issues related to sex with their parents [20]. They also counsel older youth to do the same. About 42 to 45 percent of the clinics also have educational programs for teens on these topics.

Adolescents do not begin using organized family planning services when they first have sex. They are far more likely to use a condom the first time they have sex (66 percent) than oral contraceptives, which require the help of health care providers, and 60 percent of teenage girls wait a year or more after initiating intercourse before visiting a doctor or clinic for contraception [21]. However, many sexually active teenage girls do receive family planning services.

According to the 2002 National Survey of Family Growth, an estimated 3.9 million 15- to 19- year-old girls, or nearly 40 percent of all girls in that age group, made one or more visits to a clinic or private medical source for a family planning service in a single year [22]. Approximately half of them visited a clinic [23].

Many of the girls surveyed received oral contraceptives or other prescription contraceptives that are more effective at preventing pregnancy than condoms and other nonprescription methods. Presumably, these family planning services prevented many teen pregnancies that would have occurred if the services did not exist or were significantly curtailed.

The estimated number of adolescent pregnancies averted by family planning services varies greatly, depending on what assumptions one makes about teens' behavior if highly effective, prescription contraceptives were not available. It is not known how teenagers would change their behavior if highly effective contraceptive methods were not available. Some teens might refrain from sex altogether, some might have sex and use less effective methods of contraception, and some might have sex and not use any contraception at all. If one assumes that teens would use over-the-counter methods of contraception if prescription methods were not available, then the estimated number of additional teen pregnancies averted in the United States each year ranges from 40,000 to 160,000, depending upon changes in sexual activity [24].

Unfortunately, research on the impact of family planning services is limited. While several studies have examined the effects of family planning clinics on pregnancy or birth rates [25-30], their conclusions are greatly weakened by conflicting results and several severe methodological limitations. Consequently, there are no accurate estimates of the impact of family planning services generally, and of subsidized family planning clinics specifically, on adolescent pregnancy rates.

However, data from California have been used to assess the impact of making reproductive health services more readily available to teens. In 1997, California implemented *Family PACT*, a program to prevent unintended pregnancy by providing comprehensive clinical services for family planning and reproductive health at no cost to low-income adolescents and adults. For teens, eligibility was based on their personal income, not on their parents' income, so the vast majority of them were eligible. In addition, eligibility was quickly determined at the point of service, so teens did not have to go to a Medicaid office or elsewhere before receiving services. Parental consent was not required, and patients were assured of the confidentiality of their visits. *Family PACT* included private, for-profit providers as well as nonprofit providers, thereby increasing the number of clinic sites from about 450

in 1995–1996 to more than 1,900 in 2000–2001 [31]. The program also increased the fee paid by the state for each service. Finally, the State Office of Family Planning strongly encouraged state-funded community teen pregnancy prevention programs to inform young people about the availability of reproductive health services and to make referrals to the *Family PACT* clinics. Evaluation data indicate that many teens received these referrals and attended the clinics [32].

What impact did this program have on teen use of state-funded family planning services? The number of adolescent clients served increased from 99,739 per year before *Family PACT* to more than 300,000 per year during the following six years, according to clinic records [31; 33]. This is more than a three-fold increase, suggesting that when free, confidential reproductive health services are made more readily available to teens, many more teens will use them. A subsequent study estimated that during 2002, the program prevented tens of thousands of unintended teen pregnancies [34]. If so, *Family PACT* substantially reduced the overall teen pregnancy rate throughout the state. It should be noted that *Family PACT* was implemented during a period when birth rates in California were declining more rapidly than birth rates in nearly all other states. Although many factors probably contributed to this rapid decline, *Family PACT* may have been an important one.

In sum, large numbers of young people do obtain contraceptives from family planning clinics and other providers, and these contraceptives presumably prevent many pregnancies each year. When access to reproductive health services is improved, both by increasing the number of publicly funded clinics that provide services and by making those services available at low cost to most teens, the number of teens who receive such services may rise markedly. However, because the long-term impact of family planning services on sexual behavior is not known, the net effect of family planning services on teen pregnancy, although certainly positive, is difficult to estimate.

In addition to questions about the impact of the availability of low-cost confidential reproductive health services, there are other important, though narrower, questions that have been addressed by studies using experimental or quasi-experimental designs: How can family planning services be improved so that adolescents who use them engage in less unprotected sex? More specifically, how can the protocols for clinic appointments be improved and supported by other activities? And how can broader clinic policies and other characteristics be improved to reduce teen pregnancy and STD?

*Protocols for clinic appointments and supportive activities*

Six studies have examined what happens during a clinic visit—the counseling and instruction that take place between a medical provider and a teen patient, and the materials and activities that support and reinforce that counseling. These visits are different from the curriculum-based sex and STD/HIV education programs that are designed for groups and are sometimes implemented successfully in clinic settings (Chapter 6). The six programs discussed here involve one-on-one interactions, changes in clinic protocols, or both. All six were part of longer medical appointments and, remarkably, all six had positive effects on sexual behavior (see Table 8-3).

The first study evaluated a very modest program for teenage girls with chlamydia [35]. A nurse spent about 10 to 20 minutes discussing chlamydia with the aid of a pamphlet, demonstrated how to put a condom on a banana (and got the patient to practice), and had the patient role-play getting her partner to use a condom. A study with an experimental design measured the impact of the program at six months and found that young people who received the special instruction were substantially more likely to use condoms than those who had the standard clinic visit.

The second study evaluated a two-part program for teenage boys: (1) a slide-tape component that focused on anatomy, STDs, contraception, couple communication, and access to health services,

Table 8-3: Clinic-Based Programs—Number of Studies Reporting Effects on Sexual Behavior and Outcomes

| Outcome Measured | Protocols for Clinic Appointments (N=6) | Advance Provision of Emergency Contraception (N=4) | Other Clinic Characteristics (N=2) |
|---|---|---|---|
| **Delay Sex** | (N=1) | (N=0) | (N=1) |
| Delayed Initiation | 0 | 0 | 0 |
| No Significant Results | 0 | 0 | 1 |
| Hastened Initiation | 1 | 0 | 0 |
| **Reduce Frequency of Sex** | (N=3) | (N=2) | (N=1) |
| Reduced Frequency | 1 | 0 | 0 |
| No Significant Results | 2 | 2 | 1 |
| Increased Frequency | 0 | 0 | 0 |
| **Reduce Number of Partners** | (N=2) | (N=1) | (N=0) |
| Reduced Number | 1 | 0 | 0 |
| No Significant Results | 1 | 1 | 0 |
| Increased Number | 0 | 0 | 0 |
| **Increase Condom Use** | (N=4) | (N=4) | (N=0) |
| Increased Use | 3 | 1 | 0 |
| No Significant Results | 1 | 3 | 0 |
| Reduced Use | 0 | 0 | 0 |
| **Increase Contraceptive Use** | (N=2) | (N=3) | (N=2) |
| Increased Use | 2 | 0 | 0 |
| No Significant Results | 0 | 2 | 2 |
| Reduced Use | 0 | 1 | 0 |
| **Increase Emergency Contraceptive Use** | (N=0) | (N=4) | (N=0) |
| Increase Use | 0 | 4 | 0 |
| No Significant Results | 0 | 0 | 0 |
| Decrease Use | 0 | 0 | 0 |
| **Reduce Sexual Risk-Taking** | (N=2) | (N=4) | (N=0) |
| Reduced Risk | 2 | 0 | 0 |
| No Significant Results | 0 | 3 | 0 |
| Increased Risk | 0 | 1 | 0 |
| **Reduce Pregnancy: Self-Report** | (N=2) | (N=1) | (N=2) |
| Reduced Number | 1 | 0 | 0 |
| No Significant Results | 1 | 1 | 2 |
| Increased Number | 0 | 0 | 0 |
| **Reduce Pregnancy: Laboratory Test** | (N=0) | (N=2) | (N=0) |
| Reduced Number | 0 | 0 | 0 |
| No Significant Results | 0 | 2 | 0 |
| Increased Number | 0 | 0 | 0 |
| **Reduce STDs: Self-Report** | (N=4) | (N=1) | (N=0) |
| Reduced Number | 0 | 0 | 0 |
| No Significant Results | 4 | 1 | 0 |
| Increased Number | 0 | 0 | 0 |
| **Reduce STDs: Laboratory Test** | (N=0) | (N=2) | (N=0) |
| Reduced Number | 0 | 0 | 0 |
| No Significant Results | 0 | 2 | 0 |
| Increased Number | 0 | 0 | 0 |
| **Reduce Childbirth: Self-Report** | (N=0) | (N=0) | (N=1) |
| Reduced Number | 0 | 0 | 0 |
| No Significant Results | 0 | 0 | 1 |
| Increased Number | 0 | 0 | 0 |

and (2) a visit with a health care practitioner who focused on contraception, reproductive health goals, health risks, and the patient's related interests. Both parts emphasized abstinence and the use of contraception if sexually active. A strong experimental design and questionnaire data collected a year later indicated that the program did not significantly affect sexual activity but did increase the use of contraception, especially by the boys' partners and by program participants who were not sexually experienced when the study began [36].

The third study evaluated a program that was somewhat similar to the second [37]. This program included a 21-minute video and 15 to 20 minutes of one-on-one counseling based on a previous, successful counseling approach *(Project RESPECT)*. The counseling sessions were client-focused and interactive, and one of the primary goals was to develop a realistic plan for the patient to reduce STD risk. Using an experimental design, the study found that the combination of the video and the counseling (but neither one separately) significantly increased condom use at three months but not at 12 months.

The fourth program focused on STD/HIV prevention for both genders [38]. It included a 15-minute audiotaped risk assessment and education program, a discussion ice-breaker, two brochures on skills and ways to avoid unprotected sex, a brochure on community resources, and brochures for parents. Each patient's physician then reviewed the risk assessment individually with the patient and discussed concerns and methods of avoiding unprotected sex. A study with an experimental design indicated that the program increased the use of condoms during the three months after it was implemented. The program *might* also have increased the chances of having sex, but the results were mixed and depended upon the type of data analysis used. However, both results ceased being significant after nine months. The program did not affect the frequency of sex during the three months following implementation.

In the fifth study, a family planning clinic substantially improved its protocol for adolescents by placing greater emphasis on nonmedical problems, providing more information and more counseling, delaying the medical examination until the second visit, and giving more attention to partner and parent involvement [39]. It also designated one staff person as a teen counselor. The study did not have a strong evaluation design, but its results indicate that the program did increase contraceptive use.

The sixth program was by far the most intensive [40]. Teens attending an STD clinic met individually with counselors for five weekly sessions of 60 to 90 minutes. The individual sessions included three components, which were designed to prompt a decision to reduce risky sexual behavior and set a safer-sex goal; increase social skills in handling difficult sexual situations; and increase willingness to experience unpleasant reactions to changes in behavior. In a strong randomized trial that measured impact over six months, the program reduced the number of partners, reduced the number of non-monogamous partners, reduced the number of sexual contacts with strangers, reduced the frequency of sex, and reduced the use of marijuana before or during sex.

The fact that all of these studies found positive effects on behavior is most encouraging, as is the fact that several of the programs were brief and modest. All six of the programs focused on sexual and contraceptive behavior, sent clear messages about appropriate behavior, and included one-on-one consultation about the client's own behavior. At the very least, these studies suggest that such approaches should be developed further and evaluated rigorously. The results should also encourage medical providers to review their instructional protocols with teens and to spend more time talking with individual adolescent patients about their sexual and contraceptive activity.

It should also be remembered that some of the curriculum-based sex and STD/HIV education programs discussed in Chapter 6 were implemented for groups in clinic settings and found to be effective. For example, when activities from

*Be Proud! Be Responsible!*, *Making a Difference*, and *Making Proud Choices* were integrated into a four-hour curriculum and implemented in a clinic setting, they reduced unprotected sex, the number of sexual partners, and STD rates at 12 months [41]. Similarly, *SiHLE* was implemented in an STD clinic for women and found to reduce the number of partners, increase condom use, lower pregnancy rates, and decrease STD rates at six or 12 months [42]. These curriculum-based programs are different from the programs discussed here in that they offered group instruction rather than individual counseling or care.

*Advance provision of emergency contraception*

One of the most common reasons teens give for not using contraception is that they didn't expect to have sex. That happens far too commonly among young people, who may have sex sporadically. Emergency contraception is the only method of contraception that can be used up to 72 hours after sex and that can dramatically reduce the chances of pregnancy. Thus, in theory, it has the potential to reduce teen pregnancy significantly.

Four studies measured the impact of providing emergency contraception in advance to teenage girls and young women (Table 8-3). (Some of the studies included young women through age 24 but are included here because there are no comparable studies of high-school-age girls only.)

All four studies found that providing emergency contraception in advance significantly increased the use of emergency contraception. This is consistent with studies of advance provision of emergency contraception to adults in the United States [43] and in other countries [44].

The first study was a randomized trial measuring the impact of giving one regimen of emergency contraception in advance to girls and women age 16 to 24 [45]. The program increased the use of emergency contraception by a factor of three over the four months studied. Those in the intervention group did not report greater frequency of unprotected sex than those in the comparison group at the time of the follow-up survey. However, between the baseline and follow-up surveys, the intervention group was more likely than the comparison group to switch to a less effective method of contraception. Furthermore, although the proportion of both groups who reported consistent use of birth control pills increased from enrollment to follow-up, the comparison group became more likely than the intervention group to report consistent pill use at follow-up.

The second study evaluated a program serving predominantly minority, low-income, sexually active girls and young women age 15 to 20 [46]. The randomized trial compared instruction about how to obtain and use emergency contraception (the comparison group) with instruction plus one regimen of emergency contraception (the intervention group). After a month, the intervention group was about twice as likely to have used emergency contraception as the comparison group; by six months the difference was no longer significant. However, at six months those in the intervention group reported using emergency contraception sooner after having unprotected sex than did those in the comparison group. Advance provision of emergency contraception had no impact on unprotected sex or use of hormonal contraceptives at either the one- or six–month follow-up. However, at six months, the intervention group was more likely than the comparison group to have used a condom during the last month. Although the intervention group reported only 13 pregnancies in comparison with 18 pregnancies for the comparison group, this difference was not statistically significant.

In the third study, girls and young women age 15 to 24 were assigned at random to one of three groups: an intervention group that received three regimens of emergency contraception in advance; an intervention group that had access to emergency contraception through a pharmacy; or the comparison group, which had access to emergency contraception through the clinic [47]. The study found no significant differences in the use of emergency contraceptives or other contraceptives between the pharmacy group and the comparison group. However, those in the group

given the three regimens were almost twice as likely to have used emergency contraception at six months as those in the comparison group. There were no significant differences in unprotected sex or in pregnancy or STD rates.

The fourth study was a randomized trial of sexually active girls and women age 14 to 24 [48]. The study compared an intervention group that was given two regimens of emergency contraception provided in advance and an unlimited resupply at no charge with a comparison group given normal access to emergency contraception when needed at the usual charge. After one year, the intervention group was significantly more likely to have used emergency contraception but was not significantly less likely to have become pregnant. Similarly, no significant differences were found in self-reported sexual behavior or contraceptive use or in STD rates measured with laboratory tests.

In sum, all four studies, in combination with studies of older women in the United States and other countries, demonstrate that providing emergency contraception in advance increases its use markedly, at least in the short term. Furthermore, these studies of teens and young adults found few significant effects on the use of other forms of contraception or on unprotected sex; the results that were significant were mixed (positive and negative) on use of other forms of contraception or unprotected sex. Although the mixed effects should be studied further, it appears likely that providing emergency contraception to teens does not have negative effects overall, just as it does not have negative effects among adult women.

Three of the studies measured the impact of the advance provision of emergency contraception on pregnancy rates. None found a statistically significant impact, although one did report a programmatically meaningful impact. Because emergency contraception is not designed to be used repeatedly, any given individual is likely to use it only a couple of times a year. Given that the chances of pregnancy resulting from one or two acts of unprotected sex are quite small, the use of emergency contraception once or twice over an entire year will reduce the chances of becoming pregnant by only a small amount. Thus, very large samples sizes are needed to detect the impact on pregnancy, and rarely do studies have such large samples.

*Other clinic characteristics and programs*

Two studies measured the impact of other characteristics of clinic structure or protocols (Table 8-3). The first evaluated the effect of a city-wide effort to improve family planning services for young people [49]. That initiative, called *RESPECT (Responsible Education on Sexuality and Pregnancy for Every Community's Teens)*, involved nine existing clinics that initiated or expanded after-school or evening hours, began walk-in hours for teens, decreased the average waiting time for appointments, increased the hours reserved for teenagers only, and trained staff to work with teens. In addition, the initiative conducted school and community activities, as well as a media campaign. This study differed from most of the others reviewed here in that it measured the impact of the city-wide effort on all of the young people in the targeted geographic areas, not just on those who actually used a clinic. Such a study design is far more demanding, but it was appropriate because RESPECT's goal was to expand services throughout the community, and it included a media campaign. A comparison of changes over time between the catchment area and a comparison area revealed no significant changes in contraceptive use or in pregnancy or childbearing rates.

The second study examined two initiatives, both of which were very modest [50]. In one, during a clinic visit, patients were invited to bring their parents to six subsequent visits; in the other, patients received two to six telephone calls from the clinic staff regarding their use of the contraceptives method(s) they had chosen. Only 36 percent of the teens in the first group attended any subsequent visits with their parents, but most of the second group (84 percent) talked to clinic staff when they called. Results indicated that the

program failed to have a significant impact on use of contraception or pregnancy.

These two studies examined changes in the structure of the clinic, the modest involvement of parents, and telephone follow-up. Neither study found significant positive results; however, the very small number of studies and their significant limitations prevent one from reaching any clear conclusions.

*Conclusions about the impact of clinic-based programs*

Studies of programs designed to provide reproductive health services and to increase access to contraceptives have produced both consistent and inconsistent results. Nevertheless, several patterns and conclusions emerge, including the following:

- ☆ Large numbers of young people do obtain contraceptives from family planning clinics and other providers, and those contraceptives presumably prevent many adolescent pregnancies each year. When access to reproductive health services is increased, both by increasing the number of publicly funded clinics that provide services and by making services available at low cost to most teens, the number of teens who obtain such services may increase markedly. However, because the long-term impact of family planning services on sexual behavior is not known, the net effect of such services on pregnancy is difficult to estimate.
- ☆ Brief clinic protocols and programs that provided young people with more information about abstinence, condoms, and/or other forms of contraception, that engaged young people in one-on-one discussions about their behavior, that presented a clear message, and that provided condoms or contraceptives typically did not increase sexual activity but did consistently increase the use of condoms and other contraception.
- ☆ Sexually experienced girls and young women who were given emergency contraception in advance of sex were more likely to use emergency contraception than their counterparts who did not have emergency contraception readily available. Advance provision of emergency contraception did not increase sexual activity. However, it did not significantly reduce pregnancy rates either, in part because sample sizes were too small and teens used emergency contraception too few times.

## School-Based Clinics and Condom-Availability Programs

*School-based and school-linked health clinics*

School-based clinics are located on school grounds and offer services to students in those schools. School-linked clinics are located near schools and offer services to all students. Both types of clinics provide primary health care services that are affordable and accessible to students who otherwise might not have ongoing access to such services. In 2001–2002, there were at least 1,378 school-based health centers throughout the United States, and 77 percent of them served students in grades 7 through 12 [51].

While more than 80 percent of school clinics serving adolescents provide at least one reproductive health service (such as gynecologic exams, birth control counseling, pregnancy testing, and STD diagnosis and treatment), only about one-fourth of them dispense hormonal contraceptives [51]. About one-fourth also dispense condoms.

Well-staffed, well-run clinics that dispense contraceptives have many qualities that make them ideal providers of reproductive health services for adolescents—their location is convenient to students, they reach both genders, they provide comprehensive health services, they are confidential, their staffs are selected and trained to work with adolescents, they can easily conduct follow-up monitoring and counseling, their services are free, and they can integrate education, counseling, and medical services. However, these clinics have two major drawbacks: they typically do not reach those who have graduated from or dropped out of high school, and they do not reach some-

what older men, who most often father children born to adolescent girls.

Many sexually experienced students obtain contraception from school-based clinics, when it is available. For example, a study of four clinics that provided prescriptions or actually dispensed contraceptives found that 23 percent to 40 percent of sexually experienced teenage girls obtained contraceptives through the clinic [52].

Four studies meeting the criteria for inclusion in this review examined the effects of school-based health centers [53-56], and a fifth study examined the impact of a school-linked reproductive health clinic [57] (Table 8-4). Three of the five studies covered school-based or school-linked clinics in three or more schools. These studies measured population effects—that is, they measured the effects on the entire school population, not just on students who actually used the clinics. Measuring the impact on all students is the appropriate criterion for judging the effectiveness of such an intervention, but it is a more demanding one.

A school-based clinic in Norfolk, Virginia, did not focus on reproductive health and prescribed but did not dispense contraception. A study of its impact found that it did not affect the onset or frequency of sexual intercourse, nor did it increase contraceptive use or reduce pregnancy or birth rates in that school [56].

It should be noted parenthetically that these results are consistent with the results of two other studies of school-based clinics that employed very weak quasi-experimental designs and are therefore not included in this review [52; 58]. Those two studies, of six and 19 schools, respectively, also found that school clinics did not increase sexual behavior. The study of 19 schools found that clinics decreased students' contraceptive use [58], while the study of 6 schools showed that only some clinics may have increased students' contraceptive use [52]. One of the clinics in the latter study was run by Planned Parenthood and focused on high-risk young people, emphasized pregnancy prevention, and dispensed oral contraceptives; the study found

**Table 8-4: School-Based Clinics, School-Linked Clinics and School Condom-Availability Programs: Number of Studies Reporting Effects on Sexual Behavior and Outcomes**

| Outcome Measured | School-Based Clinics and School-Linked Clinics (N=5) | School Condom Availability (N=1) |
|---|---|---|
| **Delay Sex** | (N=2) | (N=1) |
| Delayed Initiation | 1 | 0 |
| No Significant Results | 1 | 1 |
| Hastened Initiation | 0 | 0 |
| **Reduce Frequency of Sex** | (N=1) | (N=1) |
| Reduced Frequency | 0 | 0 |
| No Significant Results | 1 | 1 |
| Increased Frequency | 0 | 0 |
| **Increase Condom Use** | (N=0) | (N=1) |
| Increased Use | 0 | 0 |
| No Significant Results | 0 | 1 |
| Reduced Use | 0 | 0 |
| **Increase Contraceptive Use** | (N=2) | (N=0) |
| Increased Use | 1 | 0 |
| No Significant Results | 1 | 0 |
| Reduced Use | 0 | 0 |
| **Reduce Sexual Risk-Taking** | (N=0) | (N=1) |
| Reduced Risk | 0 | 0 |
| No Significant Results | 0 | 1 |
| Increased Risk | 0 | 0 |
| **Reduce Pregnancy: Self-Report** | (N=2) | (N=0) |
| Reduced Number | 1 | 0 |
| No Significant Results | 1 | 0 |
| Increased Number | 0 | 0 |
| **Reduce Childbirth: Self-Report** | (N=1) | (N=0) |
| Reduced Number | 0 | 0 |
| No Significant Results | 1 | 0 |
| Increased Number | 0 | 0 |
| **Reduce Childbirth: Public Records** | (N=3) | (N=0) |
| Reduced Number | 1 | 0 |
| No Significant Results | 2 | 0 |
| Increased Number | 0 | 0 |

a significantly greater use of oral contraceptives among female students in this school than among female students in the comparison school many miles away. Two other schools with clinics that dispensed both condoms and oral contraceptives, but did not have a strong educational component, showed no significant difference from comparison schools in use of condoms by male students or use of oral contraceptives by female students. Clearly, a substitution effect was in play—even though many sexually experienced students obtained contraception from the clinics, most of those students would have obtained contraception elsewhere if the clinics had not been available. Finally, both of the studies with weak quasi-experimental designs also found that school clinics did not significantly reduce pregnancy rates.

Four additional studies examined the impact of clinics on birth rates and found mixed results. A study of school-based clinics in St. Paul, Minnesota, that is not included here gave a great impetus to school-based clinics by reporting that birth rates declined in three schools in that city after clinics were opened and began to provide reproductive health care (including prescriptions for contraception) [59]. However, those conclusions were based on only one baseline year for each school and on the clinic staff's knowledge of births to students. Furthermore, it did not have a comparison group.

A subsequent study of five school-based clinics in St. Paul (including the three studied in the first report) overcame those limitations by generating birth rates from school and public records for two to five baseline years and for several years after the clinics opened [53]. That study found large year-to-year variations in school-wide birth rates but no evidence indicating that the clinics significantly reduced birth rates [53].

Similarly, a third study used public records to generate birth rates for ten years for four schools with clinics and 19 schools without clinics in Baltimore, Maryland. That study also found no evidence that opening clinics reduced birth rates [54].

In contrast, a recent study in Denver, Colorado, revealed that the birth rates for African-American teens declined more rapidly in three schools with health centers than in four schools without centers [55]. The declines in birth rates were 77 percent and 56 percent, respectively. The three schools with health centers did not provide contraceptives or prescriptions for contraceptives, but they did provide primary care, including abstinence and birth control counseling and referrals to neighborhood health clinics. At the neighborhood clinics, students did not have to have further physical examinations, and their ability to pay was based on their own income, not their parents'. African-American students attended the school-based centers frequently, more than 10 times per year on average. In addition, the health centers also supported classroom and school-wide health promotion activities.

The final study is of a school-linked clinic in Baltimore. The *Self Center*, *l*ocated across the street from a high school and four blocks away from a junior high school, provided *only* reproductive health services [57]. Specifically, it provided educational, counseling, and reproductive health services in the clinic, as well as educational and counseling services in the two schools. In both schools, the staff implemented a peer education program and after-school group discussions, while in the clinic the staff provided individual counseling, group counseling, and contraceptive services. Survey data collected from the two schools located near the clinic and two matched comparison schools found that in the two schools near the clinic, the onset of sexual intercourse was delayed among teens who had not initiated sex and the use of contraception was increased among teens who had. In addition, pregnancy rates appeared to have dropped in the intervention schools two years after the *Self Center* opened.

In sum, these studies of comprehensive school-based health centers and a school-linked reproductive health clinic provide both consistent and inconsistent results. All of the studies that measured impact on sexual behavior indicated that clinics did not increase sexual activity. In addition, consistent evidence shows that substantial

proportions of sexually experienced students did obtain contraceptives from clinics that provided prescriptions or actually dispensed contraception.

Evidence regarding contraceptive use and pregnancy and birth rates was mixed, however. There are at least three possible explanations. The first is methodological: few of these studies had strong quasi-experimental designs, and all had important limitations that could have affected results one way or the other. A second explanation involves the communities. Given the relatively wide availability of contraceptives in most communities, school-based clinics that did not focus on pregnancy or STD prevention may not have markedly increased access to contraception or affected pregnancy or birth rates. On the other hand, in communities where access to contraception was more problematic, the clinics may have improved access and contraceptive use. A third explanation is programmatic. It is notable that two clinics appeared to increase contraceptive use—the school-based clinic run by Planned Parenthood, which focused largely on reproductive health and provided a clear message about contraceptives, and the school-linked clinic that focused solely on reproductive health and whose charismatic staff sent a clear message about abstinence and contraceptives.

It is possible that, to increase school-wide rates of contraceptive use, the location of the clinic is not as important as a clear focus on reproductive health. This explanation does not fully explain the positive results in Denver, although the school-based centers did refer students to nearby clinics that provided contraception confidentially and affordably. Given the mixed results, further research is needed to explain the apparent differential success of clinics.

*School condom-availability programs*

Given the threat of AIDS, other STDs, and pregnancy, more than 300 schools without school-based clinics have made condoms available through school counselors, nurses, teachers, vending machines, or baskets [60]. These schools are in addition to more than 200 schools that make condoms available to students through school-based clinics.

The number of condoms obtained per student varied greatly from program to program [60]. In general, students in smaller, alternative schools (probably with more high-risk students) obtained many more condoms per student than students in larger schools or students in mainstream schools. In addition, when schools made multiple brands of condoms available in baskets in convenient, private locations without any restrictions, students obtained many more condoms than they did when faced with restrictions, such as being able to obtain only a small number of condoms from school personnel at specified times after brief counseling. Students also obtained many more condoms in schools that had clinics.

Thus far, only one study meeting the criteria for inclusion in this review has presented results on the behavioral effects of condom-availability programs in schools (Table 8-4). That study measured the impact of making condoms available in baskets in nine Philadelphia schools [61]. The schools offered reproductive health information, condoms, and general health referrals. Both before and after the health centers were opened, young people were randomly selected for personal interviews from census tracts surrounding the nine schools and other, comparison schools. Results revealed that in the schools with centers, changes over time in four measures of sexual behavior or condom use were not significantly different from the changes over time in the schools without centers. However, the study found consistent, nonsignificant differences in the trends over time: students in schools with centers reduced their sexual activity and increased their condom use more than students in schools without centers. Relatively small samples may have limited the ability to find statistically significant results that were programmatically meaningful.

Parenthetically, it should be noted that the study with arguably the strongest design assessed the effects of making condoms available through vending machines in five Seattle, Washington, schools

without school-based clinics, and through vending machines and baskets in five Seattle schools with school-based clinics [62]. The study used a national comparison group, not a local one, and therefore is not included in this review. Results clearly demonstrated that students obtained large numbers of condoms from the schools, especially those that had clinics and provided condoms through baskets as well as vending machines. School-wide data were collected before condoms were made available and again two years later. Neither group of schools saw an increase in sexual activity. In the schools with vending machines and no clinic, no significant changes occurred in condom use (or in use of oral contraceptives). In contrast, schools with a clinic and baskets of condoms saw a significant *decrease* in condom use and a significant *increase* in oral contraceptive use, suggesting that the clinics may have begun encouraging oral contraceptive use in addition to providing condoms. Notably, these schools also had a strong HIV education program whose effects were not measured because it existed before the baseline data collection. In addition, focus groups suggested that teens already had ample access to condoms in their communities.

It should also be noted parenthetically that two additional studies with weak quasi-experimental designs evaluated condom-availability programs. One of them evaluated a comprehensive AIDS prevention program in the New York City high schools that included condom availability [63]. Analyses compared students in New York schools after the program was put in place with a matched sample from Chicago schools; no baseline data were collected or analyzed. Results revealed that students in the New York schools were not more likely to have initiated intercourse but were more likely to have used a condom the last time they had sex (Guttmacher et al., 1997).

The second study with a weak quasi-experimental design measured the impact of making condoms available in nine randomly selected Massachusetts schools [64]. Analyses compared students in these schools with students in 50 randomly selected Massachusetts schools that did not make condoms available. The schools that made condoms available apparently were also more likely to provide their students with instruction about avoiding HIV. No baseline data on students' sexual activity or condom use were gathered, so the studies had no measure of differences between the two groups of schools before condoms were made available. Nevertheless, results indicated that students in schools where condoms were available were less likely to have ever had sex, were less likely to have had sex in the last three months, had about the same number of sexual partners in the last three months but had fewer lifetime sexual partners, were more likely to have used a condom the last time they had sex, and were less likely to have used a method of contraception other than condoms the last time they had sex.

All of these studies consistently demonstrate that making condoms available did not increase any measure of sexual activity. However, the results regarding the impact on condom use were mixed: one study found a decrease in condom use, another found nonsignificant effects, and two studies with very weak designs found positive effects. The results from the Seattle study clearly demonstrate a substitution effect: even though students obtained many condoms from the schools, they simply obtained condoms from the schools instead of from other sources in the community.

Why did these studies produce different results? There are three possibilities. First, the differences in results could have been caused by differences in research methods. If so, then this group of studies provides weak overall evidence that making condoms available in schools increases condom use. Second, the differences in results could have been caused by differences in the communities and in student needs. If teens already have ample access to condoms in their communities, as focus group data suggest they did in Seattle, then making condoms available in schools may not increase condom use. In contrast, if communities do not provide condoms in convenient, private locations, then making them available in schools may increase student access to and use of condoms. (This suggests that when

schools consider making condoms available, they should first conduct a student and community assessment to determine whether condoms are readily available in convenient and comfortable locations and whether making them available in schools would meet a real need.) Third, the differences in study results could be due, in part, to differences in the programs, such as including an educational component, small group discussions, or one-on-one counseling. This possibility is consistent with the finding that some sex and STD/HIV education programs and some brief interventions that provide individual counseling can increase condom use.

*Conclusions about the impact of school-based clinics, school-linked clinics, and school condom-availability programs*

Despite some mixed results, the studies support the following conclusions:

- ☆ Providing contraceptives in school-based clinics and making condoms available in school did not hasten the onset of sexual intercourse or increase its frequency.
- ☆ In schools with health clinics that provided prescriptions or actually dispensed contraception and in schools with condom-availability programs—especially those with few restrictions on availability and with confidential, easy access to condoms—substantial proportions of sexually experienced students did obtain contraceptives and condoms.
- ☆ Given the relatively wide availability of contraceptives in most communities, school-based clinics that did not focus on pregnancy or STD prevention did not appear to increase markedly the school-wide use of contraceptives — that is, there appeared to be a substitution effect. Consistent with this finding, the provision of contraceptives through school-based clinics did not decrease overall pregnancy or birth rates in most schools.
- ☆ Weak evidence suggests that when a few school-based or school-linked clinics not only provided contraceptives but also focused more intensively on contraception and gave a clear message about abstinence and oral contraceptives, use of contraception increased.
- ☆ Evidence suggests that a few school-based or school-linked clinics may have reduced teen pregnancy or birth rates, but it is not clear why some clinics may have had a positive impact and others did not.

### Community-wide Pregnancy or STD/HIV Prevention Initiatives with Multiple Components

During the last two decades, there has been a growing recognition that changing teen pregnancy or STD/HIV rates markedly requires more than just single programs focusing on discrete populations of teens. Therefore, many communities have developed community-wide collaborations or initiatives with the goal of reducing teen pregnancy or STDs.

Eight studies that meet the criteria for inclusion in this review have examined the impact of six community-wide programs (three studies evaluated the impact of a single program) (see Table 8-5). The first study was particularly well designed and measured the impact of adding community activities to a workshop program [65]. Fifteen low-income housing developments were assigned at random to one of three programs: a comparison-group program that only included discussion of a videotape and free condoms and brochures about condoms; a workshop program that included two three-hour workshops for younger and older teens, divided into groups by gender (four different workshops); or a community-wide program with the same workshops plus follow-up sessions, participation of community leaders in a "Teen Health Project Leadership Council," a few community-wide events sponsored by the council, and HIV/AIDS workshops for parents.

Effects were mixed. At the 18–month follow-up, the community program that included workshops plus community activities had significantly delayed the initiation of sex in comparison with the comparison group program that had no workshops and almost significantly delayed the initiation of sex in comparison with the program that

**Table 8-5: Community-Wide Pregnancy or STD/HIV Prevention Initiatives with Multiple Components—Number of Studies Reporting Effects on Sexual Behavior and Outcomes**

| Outcome Measured | Community-Based Initiative (N=6) |
|---|---|
| **Delay Sex** | (N=4) |
| Delayed Initiation | 3 |
| No Significant Results | 1 |
| Hastened Initiation | 0 |
| **Reduce Frequency of Sex** | (N=2) |
| Reduced Frequency | 0 |
| No Significant Results | 2 |
| Increased Frequency | 0 |
| **Reduce Number of Partners** | (N=1) |
| Reduced Number | 1 |
| No Significant Results | 0 |
| Increased Number | 0 |
| **Increase Condom Use** | (N=2) |
| Increased Use | 1 |
| No Significant Results | 1 |
| Reduced Use | 0 |
| **Increase Contraceptive Use** | (N=1) |
| Increased Use | 0 |
| No Significant Results | 1 |
| Reduced Use | 0 |
| **Reduce Pregnancy: Self-Report** | (N=1) |
| Reduced Number | 0 |
| No Significant Results | 1 |
| Increased Number | 0 |
| **Reduce Pregnancy: Public Records** | (N=3) |
| Reduced Number | 2 |
| No Significant Results | 1 |
| Increased Number | 0 |
| **Reduce Childbirth: Self-Report** | (N=1) |
| Reduced Number | 0 |
| No Significant Results | 1 |
| Increased Number | 0 |
| **Reduce Childbirth: Public Records** | (N=1) |
| Reduced Number | 0 |
| No Significant Results | 1 |
| Increased Number | 0 |

included workshops only. The latter program had no impact on delaying the initiation of sex. These results suggest that community activities had an impact beyond the workshops in delaying sex. At the three-month follow-up, a counterintuitive result was found: the program with workshops had a significant impact on condom use, but the program with workshops and community activities did not. At 18 months, however, both programs had a significant and roughly equal impact on increasing condom use. Despite the rigorous design of this study, these overall conflicting results make it unclear whether community activities above and beyond the workshops had an impact on sexual behavior. They may have had a positive impact on delaying the initiation of sex, but they did not significantly increase condom use.

The remaining studies examined effects on community-wide measures of sexual or contraceptive behavior, pregnancy rates, or birth rates; they did not measure the impact on the teens who were directly served. As noted above, this is the proper goal for a community-wide initiative, but it is a much more challenging and demanding one methodologically.

Monroe County, New York (which includes the city of Rochester) implemented an abstinence-oriented multicomponent initiative titled *Not Me, Not Now* [66]. It took a primarily mass communications approach that included paid television and radio advertising, billboards, posters (and guides to process the posters in schools), communication skills-building, educational materials for parents, an interactive website, and appearances at community events. Young people from the city helped develop and starred in the television ads, radio spots, and posters. In addition, a slightly modified version of *Postponing Sexual Involvement* was presented to about 3 percent of the county's middle school students. Results from a weak quasi-experimental design indicated high levels of community awareness, changes in sexual attitudes and intended behaviors consistent with the messages of *Not Me, Not Now*, a reduction in the percentage of those who had sex by age 15, and a greater decline in the pregnancy rates in Monroe County than in comparison areas.

The next study measured the effects of a comprehensive community-wide STD/HIV education initiative for adolescents designed to increase the use of condoms and reduce STD/HIV transmission in a New England city [67]. Trained peer leaders ran workshops in schools, community organizations, and health centers, organized group discussions in teens' homes, made presentations at large community events, conducted street-corner and door-to-door canvassing, and passed out condoms and pamphlets describing how to use them. In addition to the peer-led activities, public service announcements were aired on radio and television, and posters were put up in local businesses and other public locations. In comparison with young people in another city, teenage boys in the STD/HIV education initiative became less likely to initiate intercourse, and girls became less likely to have multiple partners. However, the initiative did not appear to affect significantly other measures of sexual activity or condom use. Because the study design included only two cities, it is difficult to know whether the significant changes were caused by the initiative or by other factors.

The *RESPECT* initiative in Philadelphia, discussed above, improved clinic services and conducted community-wide activities [49]. The clinics conducted hundreds of school and community programs over a three-year period and organized a two-year media campaign with posters and public transit cards. *RESPECT* was the subject of many radio programs and several newspaper articles. As noted above, analyses revealed no significant changes in contraceptive use or pregnancy or childbearing rates.

The fifth and most intensive community initiative was designed to reduce teen pregnancy in the small, rural South Carolina community of Denmark. The initiative included the following components: teachers, administrators, and community leaders were given training in sexuality education; sex education was integrated into all grades in the schools; peer counselors were trained; the school nurse counseled students, provided male students with condoms, and took female students to a nearby family planning clinic; and local media, churches, and other community organizations highlighted special events and reinforced the message of avoiding unintended pregnancy [68-70]. Once all components of the initiative were in place, the pregnancy rate among 14- to 17-year-olds declined significantly for several years. When parts of the program ended—for example, some of the community efforts declined in intensity, the school nurse resigned and her link to family planning clinics and her distribution of condoms ended, some teachers left the school, and program momentum declined more generally—the pregnancy rate returned to pre-initiative levels. From the existing data, it is not clear which of the components, or other, unknown factors, produced the changes over time in pregnancy rates.

In 1995–1996, the South Carolina program hired three additional health educators, and in 1998, it hired yet another three [70]. These six health educators provided extensive sex education in the classroom and met individually with nearly every Medicaid-eligible student (86 percent of the student body) twice a month to talk about reproductive health. After this new component was implemented, the pregnancy rate again declined markedly. One cannot be confident that these six educators, rather than other factors, caused the pregnancy rate to decline.

The final community initiative was a partial, though less intensive, replication of the South Carolina initiative in three communities in Kansas [71]. The Kansas program got the communities to become more involved in preventing teen pregnancy, enhanced sexuality education for teachers and parents, improved age-appropriate sex education in kindergarten through twelfth grade, improved access to health services, increased collaboration with school administrators, implemented mass media events, established alternative activities for young people, and got faith communities involved. Despite the many activities, it is not clear how much the initiative really focused on sexual behavior and contraceptive use. Although a few favorable trends appeared, no consistent, significant changes were

found in sexual behavior, condom use, pregnancy rates, or birth rates.

Parenthetically, it should be noted that two additional studies of large social marketing campaigns for condom use were conducted in Portland, Oregon, and Seattle [72; 73]. Neither study included a comparison group and therefore neither meets the criteria for inclusion in this review, but both conducted a series of cross-sectional surveys over time. The findings suggested that the campaign in Portland did not increase the proportion of higher-risk teens who had ever had intercourse, nor did it increase their acquisition of condoms or their use of condoms with their main partners. However, after the campaign began, there was a significant increase in their use of condoms with casual sexual partners; after the campaign ended, this use returned to baseline levels. Results from the Seattle study indicated that it did not increase sexual activity or condom use.

*Conclusions about the impact of community-wide pregnancy or STD/HIV prevention initiatives with multiple components*

The community initiatives and their impacts differed considerably. Moreover, the designs of the studies were generally weaker than those of studies of curriculum-based programs, in part because of the challenge of including multiple communities in study designs. While it is difficult to draw definitive conclusions, the studies do suggest several conclusions, some of them more tentative than others:

- ☆ The studies confirm that community initiatives focusing on pregnancy or STD/HIV prevention do not hasten or increase sexual activity, even when they focus primarily on condom or contraceptive use. None of the studies found any significant negative effects.
- ☆ The studies are encouraging in regard to delaying initiation of sex, using condoms or other contraceptives, and lowering pregnancy or birth rates in general. Four of the six studies found significant effects on one or more these outcomes. The findings are particularly impressive because most of the studies measured impact on community-wide outcomes, not individual outcomes measured only among those individuals most directly involved.
- ☆ One or more studies found positive effects on initiation of sex, number of sexual partners, condom use, and pregnancy rates, suggesting that the effects of these initiatives are not limited to any particular behavior.
- ☆ By far the most intensive initiative, the one in Denmark, South Carolina, might also have been the most effective in terms of reducing pregnancy. However, when others attempted to replicate it, but did so poorly, they did not achieve consistent positive effects.
- ☆ The effects of both the social marketing campaign in Portland and the South Carolina initiative also suggest that programs must be maintained if they are to continue to have an effect. In both cases, after the initiatives diminished or ended, use of condoms or pregnancy rates returned to pre-initiative levels. This finding is consistent with studies of marketing efforts generally.

## PROGRAMS THAT FOCUS PRIMARILY ON NONSEXUAL RISK AND PROTECTIVE FACTORS

Research clearly suggests that improving teenage girls' performance in school, their plans for the future, and their connections to family, school, and faith community all reduce pregnancy and birth rates [74]. In many countries throughout the world, young women's fertility rates declined as their educational and employment opportunities improved. In the United States between the mid-1950s and the mid-1970s, increasingly larger percentages of young women pursued higher education and more challenging professional careers and postponed marriage and childbearing. The teen birth rate declined markedly during those years [21]. Researchers have found that many types of risky behavior are related to each other and have therefore advocated approaches that focus on the whole individual rather than

separate programs that focus on specific aspects of each individual.

In light of these trends, some professionals working with young people believe that two of the most promising approaches to reducing teen pregnancy are to improve educational and career opportunities through youth development programs and to increase the connection between young people and responsible adults and institutions such as the family, schools, and community organizations. The programs summarized thus far have focused primarily on changing the *sexual* risk and protective factors affecting adolescent sexual behavior: the knowledge, attitudes, norms, and skills involving sexual and contraceptive behavior. The next part of this chapter describes youth development programs that focus primarily on the *nonsexual* factors that affect adolescent sexual behavior: involvement with adults, attachment to school, educational goals, and community employment opportunities. Such programs are designed to improve participants' education, life skills, and employment options.

Professionals working with young people have also considered whether welfare reform might generate new community norms about work and childbearing and cause more low-income parents to work, thereby curtailing adolescent childbearing, particularly among adolescents whose parents are directly affected by welfare reform policies and programs.

Three kinds of programs focus on nonsexual risk and protective factors: welfare reform for adults, child development programs for very young children, and youth development programs for adolescents. This chapter considers all three.

### Welfare Reform for Adults

Numerous studies have measured the impact of welfare reform policies and programs for adults on childbearing by their adolescent children. Sixteen such studies have been summarized in a rigorous meta-analysis [75]. All of them used experimental designs to measure the impact of the following three aspects of welfare reform: the requirement that parents work or participate in activities to increase their employability, supplements to the income of parents who were or became voluntarily employed, and time limits on receipt of cash assistance, which were designed to encourage families to leave welfare rolls. While the programs did have significant positive effects on school performance, they did not have a significant impact on adolescent childbearing (Table 8-6).

*Conclusions about the impact of welfare reform for adults*

- ☆ The meta-analysis provides strong evidence that three aspects of welfare reform policies and programs for adults did not affect adolescent childbearing.
- ☆ One should not conclude that welfare policies and programs that affect adolescents directly have no impact on childbearing, for such policies and programs were not evaluated.

### Early Childhood Development Programs

Only one study meeting the criteria for inclusion in this review evaluated the impact on teen pregnancy and childbearing of an early childhood development program, the *Abecedarian Project* [76] (Table 8-6). Infants in low-income families were

**Table 8-6: Welfare Reform for Adults and Early Childhood Development Programs—Number of Studies Reporting Effects on Birth Rates**

| Outcome Measured | Welfare Reform (N=1) | Early Childhood Development (N=1) |
|---|---|---|
| Reduce Childbirth: Self-Report | (N=1) | (N=1) |
| Reduced Number | 0 | 1 |
| No Significant Results | 1 | 0 |
| Increased Number | 0 | 0 |

randomly assigned to one of two groups: a group that participated in a full-time, year-round day care program focused on improving intellectual and cognitive development, or one that received whatever day care the families and communities could provide. In elementary school, all of the study participants were randomly assigned to either the normal school environment or a three-year program to involve parents and improve parent-school communication about the child. All children in the study were tracked until age 21. Those who had been in the preschool program delayed childbearing by more than a year, compared to the comparison group. They also scored higher on a number of intellectual and academic measures and received more years of education than the comparison group. The children who participated in the elementary school program also performed significantly better than the comparison group on all of these outcomes, but the results were not quite as strong. Although the sample size was small (N=104), the *Abecedarian* program's results were significant. The program's impact on educational attainment may partially explain why participants delayed childbearing.

Parenthetically, it should be noted that the results of the *Abecedarian* study are consistent with the results of the *High/Scope Perry Preschool Study*, which measured the long-term impact of a high-quality, active-learning preschool program on girls and found a significant reduction in teen pregnancy [77]. *The High/Scope* study is not included in this review because its sample size for pregnancy results is too small (N=49).

*Conclusions about early childhood development programs*

- ☆ Because only two studies, both with small samples, measured the impact of early childhood development programs on teen pregnancy or childbearing, little can be concluded from them.
- ☆ Results of the studies are nevertheless encouraging and suggest that other studies of early childhood development programs should measure long-term impact on teen pregnancy and childbearing.

## Youth Development Programs for Adolescents

*Service learning programs*

By definition, service learning programs have two components: voluntary or unpaid service in the community (e.g., tutoring, working as a teacher's aide, working in nursing homes, or helping fix up parks and recreation areas), and structured time for preparation and reflection before, during, and after service (e.g., group discussions, journal writing, or papers). Sometimes the service is voluntary, and sometimes it is part of a class. Often, the service is linked to academic instruction in the classroom.

Service learning programs present strong evidence of reducing teen pregnancy rates while young people are enrolled in the programs. Four different studies, three of which evaluated programs in multiple locations, have consistently indicated that service learning reduces either sexual activity or teen pregnancy [78-82] (Table 8-7).

The first study of a service learning program evaluated the *Teen Outreach Program (TOP)* in several sites [80]. It found that teenagers were less likely to report becoming pregnant or causing a pregnancy during the school year in which they participated in *TOP*, but because the comparison group consisted of teens identified by participants as similar to themselves, self-selection effects might have influenced the result. Consequently, a second study was completed, this time with an experimental design that assigned teens at random to participate in *TOP* or not to participate [78]. The second study also evaluated the impact of the program in multiple sites around the country. The intervention group spent an average of 46 hours doing service. Like the first study, it found that girls in the program reported lower pregnancy rates during the school year than girls in the comparison group (the second study measured only teens who became pregnant, not teens who caused a pregnancy). Participants in TOP (both male and female) also

### Table 8-7: Youth Development Programs for Adolescents—Number of Studies Reporting Effects on Sexual Behavior and Outcomes

| Outcome Measured | Service Learning (N=4) | Vocational Education (N=3) | Other Development (N=3) |
|---|---|---|---|
| **Delay Sex** | (N=1) | (N=1) | (N=1) |
| Delayed Initiation | 1 | 0 | 1 |
| No Significant Results | 0 | 1 | 0 |
| Hastened Initiation | 0 | 0 | 0 |
| **Reduce Frequency of Sex** | (N=1) | (N=1) | (N=0) |
| Reduced Frequency | 1 | 0 | 0 |
| No Significant Results | 0 | 1 | 0 |
| Increased Frequency | 0 | 0 | 0 |
| **Reduce Number of Partners** | (N=0) | (N=0) | (N=2) |
| Reduced Number | 0 | 0 | 2 |
| No Significant Results | 0 | 0 | 0 |
| Increased Number | 0 | 0 | 0 |
| **Increase Condom Use** | (N=0) | (N=0) | (N=1) |
| Increased Use | 0 | 0 | 0 |
| No Significant Results | 0 | 0 | 1 |
| Reduced Use | 0 | 0 | 0 |
| **Increase Contraceptive Use** | (N=0) | (N=1) | (N=0) |
| Increased Use | 0 | 0 | 0 |
| No Significant Results | 0 | 1 | 0 |
| Reduced Use | 0 | 0 | 0 |
| **Reduce Pregnancy: Self-Report** | (N=3) | (N=1) | (N=1) |
| Reduced Number | 3 | 0 | 1 |
| No Significant Results | 0 | 0 | 0 |
| Increased Number | 0 | 1 | 0 |
| **Reduce Childbirth: Self-Report** | (N=0) | (N=3) | (N=2) |
| Reduced Number | 0 | 0 | 1 |
| No Significant Results | 0 | 2 | 1 |
| Increased Number | 0 | 1 | 0 |
| **Reduce STDs: Self-Report** | (N=0) | (N=0) | (N=1) |
| Reduced Number | 0 | 0 | 0 |
| No Significant Results | 0 | 0 | 1 |
| Increased Number | 0 | 0 | 0 |

had lower rates of school failure than the comparison group.

A third study measured the impact of exemplary *Learn and Serve* programs throughout the country [79]. Students in these programs spent an average of 77 hours providing service. The study did not employ an experimental design with random assignment, but it did identify similar students in other school classes or other schools as a comparison group. The results tended to confirm the *TOP* results: participants in the *Learn and Serve* programs reported lower pregnancy rates during the school year in which they participated. Among middle school students the impact was significant ($p = .05$), but among middle school and high school students combined, the result was not quite significant ($p=.10$). The *Learn and Serve* study also found that the positive impact on pregnancy (and on most other outcomes) did not last through the school year following the year of participation. This finding suggests that participation in service learning programs may reduce teen pregnancy rates only during the semesters in which students actually participate.

Finally, a pair of studies measured the impact of a health education curriculum alone and the combined impact of the same health education curriculum and service learning [81; 82]. Results indicated that the health education curriculum alone did not significantly decrease sexual activity, but the curriculum plus service learning did. In the short term it delayed the initiation of sex, while in the long term (more than three years later) it delayed the initiation of sex and reduced the percentage of students who had had sex the previous month. These studies suggest that service learning may reduce teen pregnancy rates in part by reducing sexual activity.

Several explanations have been suggested for why service learning programs reduce teen pregnancy: participants may develop ongoing relationships with caring program facilitators; they may develop greater autonomy and feel more competent in their relationships with peers and adults; and some may be heartened by the realization that they can make a difference in the lives of others. All of these possibilities may motivate teens to avoid pregnancy. The volunteer experiences also encouraged teens to think more about their future. Moreover, the adult supervision and many hours of work entailed in service learning activities may simply have reduced the opportunity for engaging in problem behavior, including unprotected sex. After all, these programs were time-intensive—the mean numbers of hours spent in *TOP* and *Learn and Serve* during the academic year were 46 and 77, respectively. The study of *TOP* found that the kinds of volunteer service varied considerably from site to site, but programs appeared to be most effective when young people had some control over where they volunteered [78]. The effectiveness of *TOP* was *not* dependent upon the fidelity with which the curriculum was replicated [83], which suggests that service itself is the most important component of the programs.

*Vocational education and employment programs*

Vocational education and employment programs typically include academic instruction (or an educational requirement) and either vocational education or actual jobs. Three studies evaluated such programs, all in more than one site (Table 8-7).

The first study evaluated the impact of the *Summer Training and Education Program (STEP)* [83-85]. Young people in the program were given 90 hours of academic remediation and half-time summer employment. They also received 36 sessions of life skills education and five to 15 hours of other support during the school year. The comparison group was given full-time summer employment. The study, which had a very strong experimental design, revealed that the program did not have a consistent, significant impact on either sexual activity or the use of contraception.

The remaining two studies examined *Job Corps* and *JOBSTART*, programs that were implemented in the late 1980s and 1990s. Both target somewhat older, disadvantaged teens, but *JOBSTART* is restricted to school dropouts. In both studies, about 73 percent of the participants were 16 to 19 years old, and the rest were older. Both

programs combined remedial, academic, and vocational education [86; 87]. To varying degrees, they also provided other support services, including life skills education, health education, health care, and job placement assistance. *Job Corps* was mostly residential; *JOBSTART* was not. Studies of both programs incorporated strong experimental designs with random assignment of individual participants, large sample sizes, long-term measurement (30 and 48 months), and measurement of either pregnancy or childbearing (but not sexual behavior).

Results demonstrate that neither program affected overall pregnancy or birth rates. *Job Corps* had no significant impact on birth rates measured at the 30-month follow-up, and *JOBSTART* had no impact at 48 months on the pregnancy or birth rates of young women who were not residing with their children when the study began. One small exception is worth noting. In the *JOBSTART* study, teen mothers who resided with their children were *more* likely to become pregnant or give birth than their counterparts in the comparison group. Overall, the studies provide rather strong evidence that vocational education and employment programs did not have significant positive effects on pregnancy or childbearing.

*Other youth development programs*

Three studies examined the impact of three very different youth development programs for adolescents (Table 8-7). The first study evaluated the *Quantum Opportunities Program* [88], which was implemented among high school students whose families received public assistance. This very comprehensive program included educational activities (e.g., tutoring and computer-based instruction), community service activities, and development activities (e.g., arts and career and college planning). It focused on academic achievement but gave considerable attention to social competence as well. Participants received small stipends and bonus payments for participation and completion of activities, as well as matching funds for approved activities after school hours. Although the evaluation had a strong research design, its sample size was small (N=156 for analyses of birth rates) and many questions remain about the quality of the actual program implementation. Results suggested a lower birth rate among program participants than the comparison group, but this finding was not quite significant (p=.10).

The second study used a quasi-experimental design to measure the impact of the *Seattle Social Development Program* [89; 90], which was designed to increase children's attachment to school and family by improving teaching strategies (e.g., cooperative learning) and parenting skills. To improve the quality of teaching, the program provided five days of in-service training each year for teachers of grades 1 through 6. Many teachers participated in this part of the program. To improve parenting skills, the program offered classes for parents of children in grades 1 through 3, 5, and 6; relatively few parents attended the classes. The program also expanded the school curriculum to include social skills, such as decision-making and refusal skills. When these grade-school students were followed to age 18, those who had participated in the program were less likely to report a pregnancy than those in the comparison group. They were also more attached to school, got higher grades, and engaged in fewer delinquent acts. When the same students were followed to age 21, the study found that they initiated sex at a later age, had fewer sexual partners, and were more likely to have used a condom when they last had sex than students in the comparison group. In-depth analysis revealed that the effect on condom use occurred among African-American participants. Young women who had been in the program were significantly less likely to become pregnant or to have a baby than young women in the comparison group. And finally, consistent with the finding of increased condom use among African-Americans, participants overall were less likely to report an STD diagnosis than students in the comparison group.

The third study used a randomized, controlled trial to measure the six-year impact of the *New Beginnings Program*, designed to prevent mental health problems among adolescent children of

divorced parents [91]. The program had two versions, one for mothers only and one for mothers and their adolescent children. The program for mothers focused on methods of improving the quality of the mother-teen relationship, the use of effective discipline, access to the father, and lack of interparent conflict. The program for mothers and teens also focused on effective coping strategies, improving parent-child relationships, and addressing stressors related to divorce. Groups met for 11 sessions. Either or both of the programs had significant positive effects on mental health problems, substance use, and number of sexual partners. Other sexual behaviors were not measured.

*Conclusions about the impact of youth development programs for adolescents*

The studies support several conclusions:

- ☆ Service learning, which combines community service with reflection on that experience, appears to reduce teen pregnancy during the academic year in which students complete the service. It appears to be effective even without addressing sexuality directly.
- ☆ Vocational education programs that include academic remediation, vocational education, and a few support services do not significantly reduce teen pregnancy or birth rates in the long run.
- ☆ Other youth development programs, such as those designed to improve the quality of teaching in elementary school and student attachment to school, very comprehensive and intensive youth development programs, and programs for divorced parents and their adolescent children, have produced rather consistent encouraging results, but too few studies and too many important study limitations preclude one from reaching any strong conclusions.
- ☆ At this point, it is simply not clear why some youth development programs (service learning) reduce teen pregnancy and others with some similar characteristics (vocational education) do not. This is an important area for further research.

## PROGRAMS THAT FOCUS ON BOTH SEXUAL AND NONSEXUAL RISK AND PROTECTIVE FACTORS

A number of studies have examined programs that focus on both sexual and nonsexual factors affecting teen pregnancy. Such programs had some components that addressed sexuality and others that addressed youth development more broadly.

### Programs That Address Substance Abuse, Violence, and Sexual Risk-Taking

Some programs strive to change several types of health-related or risky behavior, such as alcohol use, drug use, and violence, as well as sexual risk-taking. Some of these programs are called "character education programs." Typically, such programs attempt to infuse a wide range of positive values in young people in the expectation that those values will guide them and will discourage them from engaging in antisocial or risky behavior. Altogether, seven studies measured the impact of programs designed to change multiple types of risky behavior (Table 8-8).

The first study measured the impact of *Teen Star*; a character education program designed to reduce adolescent drug use, violent behavior, and risky sexual behavior [92]. It attempted to help students identify their ideal desired lifestyle and to understand how drug use, violence, and sex can conflict with that lifestyle. It also attempted to improve students' perceptions of peer norms regarding these three topics, to make commitments to avoid such behavior, and to become more attached to school. Results of a well-designed study showed that *Teen Star* did not have an overall impact on substance use, violence, or sexual activity.

The second study evaluated *Project AIM (Adult Identity Mentoring)*. It was based on the theory that motivation to engage in various kinds of

**Table 8-8: Programs That Address Substance Abuse, Violence, and Sexual Risk-Taking—Number of Studies Reporting Effects on Sexual Behavior and Outcomes**

| Outcome Measured | Programs Addressing Substance Abuse, Violence, and Sexual Risk-Taking (N=7) |
|---|---|
| **Delay Sex** | (N=2) |
| Delayed Initiation | 1 |
| No Significant Results | 0 |
| Hastened Initiation | 1 |
| **Reduce Frequency of Sex** | (N=5) |
| Reduced Frequency | 2 |
| No Significant Results | 2 |
| Increased Frequency | 1 |
| **Increase Condom Use** | (N=2) |
| Increased Use | 1 |
| No Significant Results | 1 |
| Reduced Use | 0 |
| **Reduce Sexual Risk-Taking** | (N=2) |
| Reduced Risk | 1 |
| No Significant Results | 1 |
| Increased Risk | 0 |

behavior (including sexual behavior) is affected by people's "mental images of possible future selves" [93]. If their views are too negative, they may not plan for the future and may not be motivated to delay gratification. If their views are too positive, they may not accurately gauge possible setbacks or obstacles. *Project AIM* was designed to get young people to develop positive adult, professional identities and to consider how their current behavior might affect their future. The program incorporated small groups and role models to encourage norms favoring delaying or abstaining from sex and avoiding drug use, violence, or dropping out of school. A randomized trial found that *Project AIM* reduced sexual activity at 19 weeks for both genders and reduced sexual activity of teenage boys at one year.

The study of the *Reach for Health* curriculum focused on alcohol and drug use, violence, and sexual behavior among seventh- and eighth-graders [81]. It was based on the appropriate parts of the *Teenage Health Teaching Modules* and other health curricula that are widely used in the United States with this age group. The original *Teenage Health Teaching Modules* focus on knowledge and skills and cover a wide variety of health goals. Using a quasi-experimental design, this study found no significant impact on either recent sex or sexual risk-taking.

The study of *Project Model Health* targeted several types of health-related behavior, including nutrition, marijuana use, tobacco use, drinking and driving, and sexuality [94]. Taught in middle school, *Project Model Health* was based on social learning theory and social influence theory. For example, it was taught by college students who served as role models and helped conduct role-playing activities. The program provided information about peer behavior to improve perception of peer norms and emphasized the short-term effects of risky behavior. The study with a quasi-experimental design indicated that the program did have positive effects on smoking and nutrition but did not have a significant impact on having sex during the past month, perhaps because of limited sample size.

*Project Model Health* was modified and supplemented with parent, peer, and community components and became *Healthy for Life* [95]. In a much larger, randomized trial, the new program appeared to have increased the initiation of sex at one follow-up survey (but not at two others) and to have increased the frequency of sex at one follow-up (but not two others). The program did not affect condom use. Despite an otherwise strong design, the study was not able to measure sexual behavior before the program was implemented nor to rule out preexisting differences in the schools.

The sixth study evaluated the impact of *Stay Smart*, an abstinence program targeting sex, smoking, drinking, and drug use [96]. It was implemented in Boys and Girls Clubs and was

based on a social competence model. It focused on peer and social influences, strengthening personal skills to resist negative influences, and developing skills for coping with life. The study found that, overall, the program did not have a significant impact on sexual behavior.

The *Aban Aya Youth Project* developed two programs, the social development curriculum and the school-community initiative [97]. The social development curriculum was intensive, comprising 16 to 21 lessons per year for children in grades 5 through 8. The lessons focused on social competence skills needed to manage situations that might lead to high-risk situations such as drug use, violence, or unprotected sex (e.g., skills to build self-esteem and empathy, manage stress, improve relationships, resist pressure, set goals, make better decisions, and resolve conflicts). The curriculum also strove to increase African-American cultural values and pride. The school-community program included the same curriculum plus reinforcements through parental support, school-wide activities, and community linkages among students, parents, schools, and local businesses. The long-term results of a randomized trial indicated that among boys, the curriculum alone reduced violence and substance use, while the curriculum in combination with parental, school-wide, and community activities significantly reduced violence-provoking behavior, school delinquency, substance use, and recent sexual activity and significantly increased condom use. In contrast, no significant effects were found among girls.

*Conclusions about the impact of programs that address substance abuse, violence, and sexual risk-taking*

The seven studies suggest the following:

- ☆ As a group, programs designed to reduce substance use, violence, and sexual risk-taking were not particularly effective. Several had no significant positive effects on sexual behavior, and one even produced two negative effects.
- ☆ On the other hand, two studies, of *Project AIM* and *Aban Aya Youth Project*, found long-term positive effects on the sexual behavior of boys. It is not clear why these two programs were effective when others were not, but it should be noted that *Aban Aya* was an intensive, long-term program.

### Multi-Component Programs That Focus Primarily on Sexual Risk-Taking but Include Sexuality and Youth Development Components

Other programs that focus on both sexual and nonsexual risk and protective factors also have multiple components, including a youth development component, but do not focus primarily on substance abuse and violence.

*Abstinence-until-marriage programs*

Two abstinence-until-marriage programs were part of the Mathematica study mentioned in Chapter 6. Both include a strong curriculum component and strong youth development components [98]. In one program, students were enrolled in a year-long elective class during the school day, with mandatory daily attendance. This school component used two curricula, *ReCapturing the Vision* and *Vessels of Honor*. The school component was supplemented by home visits from social workers, referrals to local services, tutoring, community service projects, cultural events, family retreats, an annual teen abstinence rally, and an annual teen talk symposium with a celebrity panel. In addition to a different curriculum implemented in school, the second program included activities for teens and parents such as parent workshops, teen mentoring, and a seven-week summer program with teen mentors. Neither program had a significant impact on initiation of sex, sex in the last 12 months, number of sexual partners, unprotected sex, pregnancy rates, birth rates, or STD rates.

*Client-centered programs*

A single study evaluated the impact of three programs in Washington State [99] (Table 8-9). All three programs started with the premise that many adolescents, especially high-risk adolescents, have a variety of emotional needs and problems that affect their sexual behavior. The

Table 8-9: Multi-Component Programs with Both Sexuality and Youth Development Components—Number of Studies Reporting Effects on Sexual Behavior and Outcomes

| Outcome Measured | Abstinence-until-Marriage Programs (N=2) | Client-Centered Programs (N=1) | Programs for Sisters of Pregnant Girls (N=1) | Very Intensive, Long-Term Youth Development Programs (N=2) |
|---|---|---|---|---|
| **Delay Sex** | (N=2) | (N=1) | (N=1) | (N=2) |
| Hastened Initiation | 0 | 0 | 0 | 0 |
| No Significant Results | 2 | 1 | 0 | 1 |
| Delayed Initiation | 0 | 0 | 1 | 1 |
| **Reduce Frequency of Sex** | (N=2) | (N=1) | (N=1) | (N=1) |
| Increased Frequency | 0 | 0 | 0 | 0 |
| No Significant Results | 2 | 0 | 1 | 1 |
| Reduced Frequency | 0 | 1 | 0 | 0 |
| **Reduce Number of Partners** | (N=2) | (N=0) | (N=1) | (N=1) |
| Increased Number | 0 | 0 | 0 | 0 |
| No Significant Results | 2 | 0 | 1 | 1 |
| Reduced Number | 0 | 0 | 0 | 0 |
| **Increase Condom Use** | (N=2) | (N=0) | (N=0) | (N=2) |
| Reduced Use | 0 | 0 | 0 | 0 |
| No Significant Results | 2 | 0 | 0 | 2 |
| Increased Use | 0 | 0 | 0 | 0 |
| **Increase Contraceptive Use** | (N=0) | (N=1) | (N=1) | (N=1) |
| Reduced Use | 0 | 0 | 0 | 0 |
| No Significant Results | 2 | 1 | 0 | 1 |
| Increased Use | 0 | 0 | 1 | 0 |
| **Reduce Sexual Risk-Taking** | (N=0) | (N=0) | (N=0) | (N=1) |
| Increased Risk | 0 | 0 | 0 | 0 |
| No Significant Results | 0 | 0 | 0 | 1 |
| Reduced Risk | 0 | 0 | 0 | 0 |
| **Reduce Pregnancy: Self-Report** | (N=2) | (N=0) | (N=1) | (N=2) |
| Increased Number | 0 | 0 | 0 | 1 |
| No Significant Results | 2 | 0 | 0 | 0 |
| Reduced Number | 0 | 0 | 1 | 1 |
| **Reduce Childbirth: Self-Report** | (N=2) | (N=0) | (N=0) | (N=1) |
| Increased Number | 0 | 0 | 0 | 0 |
| No Significant Results | 2 | 0 | 0 | 0 |
| Reduced Number | 0 | 0 | 0 | 1 |

three programs implemented a client-centered approach that was based on the service providers' understanding of why the teens they were working with took sexual risks. The service providers generally believed that their teen clients lacked one or more of the following: information about sex, a variety of coping skills, emotional support, positive guidance, and adults whom they could trust and talk to about sensitive issues. The programs tried to ameliorate these problems and others by providing small-group and individualized education and skill-building sessions, as well as several other services tailored to each teen, such as counseling, mentoring, referrals, and advocacy. Results of the study indicated that the programs did not delay sex or increase contraceptive use, but they did reduce the frequency of sex.

*Programs for siblings of pregnant teenagers*

One study evaluated the impact of several different programs in 44 sites in California [100]. The programs all targeted girls and boys at high risk of becoming pregnant because their sisters had become pregnant as teenagers. The primary goals of the programs were to delay sex, increase contraceptive use, and decrease risky behaviors associated with teen pregnancy (e.g., drinking and drug use). To achieve these goals, the programs were designed to help girls and boys remain in school or return to school, increase self-esteem, improve knowledge and skills to make decisions about their health, improve access to health and reproductive health services, and increase communication with parents and adults. The programs used multiple strategies, including both individual case management and group activities and services, but the activity that occupied the greatest amount of time was recreation. The girls and boys also spent a large proportion of their time in small group activities focusing on various topics.

In general, these were not intensive youth development programs: the mean number of hours of participation was less than 19, although the number of hours varied from less than one to more than 95. While the evaluation was limited by lack of random assignment and possible selection effects, the results indicated that among girls the interventions delayed sex and lowered reported pregnancy rates nine months later, among males the interventions increased consistency of contraceptive use.

*Very intensive, long-term programs*

Perhaps the most intensive program, conducted over the longest time was the *Children's Aid Society-Carrera Program (CAS-Carrera Program)* [101]. This program recruited teens when they were about 13 to15 years old and encouraged them to participate throughout high school. During those years, it operated five days a week. Some programs had regularly scheduled special events, education programs, and entrepreneurial activities. During the summer, paid employment, including entrepreneurial activities, were emphasized, along with evening maintenance programs. Participants spent an average of 16 hours per month in the program during the first three years. The *CAS-Carrera Program* used a holistic approach, providing multiple services: family life and sex education, an education component that included individual academic assessment, tutoring, help with homework, preparation for standardized exams, and assistance with college entrance, a work-related component that included a job club, stipends, individual bank accounts, employment, and career awareness, self-expression through the arts, andindividual sports. In addition, the program provided mental health care and comprehensive medical care, including reproductive health services and contraception when needed. In all of these areas, staff tried to create close, caring relationships with participants. Although the program focused on teens, it also provided services for the participants' parents and other adults in the community.

The evaluation of the *CAS-Carrera Program* was a rigorous one. It included twelve sites (six New York City site and six sites elsewhere in the country), random assignment, a large sample size, long-term measurement, measurement of behavior, and appropriate statistical analyses. The study found that, for girls, the program significantly delayed the initiation of sexual intercourse, increased the use of condoms along with

another highly effective method of contraception, and reduced pregnancy rates for three years. However, the favorable results for initiation of sex and avoiding sexual risk among girls were found only in the six New York City sites and not in the six sites elsewhere in the country [102]. For boys, the program had no significant positive behavioral effects in any of the sites. The study did have one unexpected finding: boys in the programs were significantly *less* likely to report using both condoms and another highly effective contraception method at last sex than boys in the comparison group. This result was found among boys who had initiated sexual activity prior to the program. All of these findings are reported for all teens in the intervention and comparison groups, even though some teens in the intervention group (especially the boys) did not participate extensively in the program, and some members of the comparison group received a few services from the same organization or other organizations in the community.

While studies of other programs in this review have found significant effects on the reduction of pregnancy rates, this study of the *CAS-Carrera Program* is the only evaluation to date using random assignment and a large sample size that found a positive impact on sexual and contraceptive behavior and on pregnancy rates among girls *for three years*. In fact, the pregnancy rate among girls in the intervention group was *less than half* the rate among girls in the comparison group (10 percent versus 22 percent). These are important results.

The *CAS-Carrera Program* is complex and requires significant financial and staff resources to implement. Sites that do not adopt all of the components or that do not fully engage young people over time cannot expect to achieve such positive results. Even the six sites elsewhere in the country did not produce all of the positive behavioral findings.

Some of the challenges of implementing the *CAS-Carrera Program* were manifested in a serious attempt to replicate the program in three communities in Florida [103]. The Florida staff tried earnestly to implement all of the program components, but they did so without the benefit of training and support from the *CAS-Carrera* staff. The Florida programs had difficulty recruiting teens, keeping them involved, and retaining excellent staff. Teens participated less frequently and for shorter periods of time in these programs than in the original *CAS-Carrera Program*, and teens assigned to the comparison group ended up participating in other, somewhat similar activities (e.g., school sports) offered by the communities. In part because of the comparison group's participation in other programs, no significant positive effects were found on the large majority of outcomes, including sexual behavior.

These results, in combination with the less favorable results in the six sites not in New York City in the original study, suggest that when the *CAS-Carrera Program* is implemented without the implementation manuals, training, oversight, and intensive involvement of the *CAS-Carrera* staff, when excellent staff are not retained for long periods of time, when teens participate for fewer hours, and when other community programs are available, the program may not produce the positive effects on sexual outcomes that were observed in New York City.

Why was the *CAS-Carrera Program* successful in New York City when other programs with some similar components (*JOBSTART*, *Job Corps*, and the *Conservation and Youth Service Corps*) were not successful elsewhere? There are several possible explanations. First, the vocational education programs targeted somewhat older teens and tracked them into their early twenties, when childbearing is more normative and less costly. Second, the *CAS-Carrera Program* included a sexuality education component in combination with improved access to reproductive health and other health services, as well as intensive youth development components. Third, staff in the *CAS-Carrera Program* may have been particularly charismatic and may have developed closer relationships with the young people they served. And fourth, the *CAS-Carrera program* sent a much stronger message about avoiding pregnancy than the vocational education programs did.

*Conclusions about the impact of programs that focus on sexual risk-taking, with sexuality and youth development components*

These programs, all with multiple components that address both sexual and nonsexual risk and protective factors, differed considerably. They differed in the messages they sent about sexual behavior, their intensity, programmatic components, and activities. Although definitive conclusions are elusive, the studies support the following conclusions:

☆ Some programs with multiple youth development and reproductive health components can have a positive effect on one or more types of sexual behaviors, but others may not.

☆ Some abstinence-until-marriage programs, even intense ones with multiple components, do not have significant effects on sexual behavior. This finding is consistent with the finding in Chapter 6 regarding curriculum-based abstinence-until-marriage programs without other components. However, this result does not mean all such programs are ineffective.

☆ Intensive programs that address both sexual and nonsexual risk and protective factors over an extended period of time can even reduce pregnancy and childbearing. One such program is the *CAS-Carrera Program* that for three years reduced pregnancy among girls in the original New York City sites. Notably, it included multiple components, was very intensive, lasted throughout high school, created close connections between staff and participants, provided a very clear message about avoiding pregnancy, and improved access to reproductive health services.

☆ The *CAS-Carrera Program* and other comprehensive programs with both reproductive health and youth development components can be challenging and costly to implement effectively. In addition, some of the positive results found in the *CAS-Carrera Program* in New York City were not reproduced in other sites or studies.

☆ Despite the success of many of these programs, it is not clear why programs were not always effective or why there were inconsistent and strong gender effects. *Aban Aya* was effective only with boys, and the *CAS-Carrera Program* was effective only with girls. Further research is needed to understand why some programs are effective, why some programs are effective with some groups but not others, and how to delineate the qualities of effective programs.

☆ ☆ ☆

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## REGARDING THE RESEARCH EVIDENCE

☆ More than 100 studies provide good evidence about the impact of a variety of different types of programs.

☆ However, at least four shortcomings limit the conclusions that can be drawn about the impact of programs.

- Many approaches to prevention have not been evaluated sufficiently, if at all.
- Evaluations of only a few programs have been replicated.
- Many of the studies were limited by methodological problems or constraints.
- Some results were inconsistent.

☆ In the future, specific research agendas and activities can help produce more definitive conclusions about what works and what doesn't.

## REGARDING THE EFFECTS OF PROGRAMS

☆ Different kinds of evidence consistently indicate that no single, simple approach will dramatically reduce teen pregnancy and STDs.

☆ However, multiple, quite different approaches can help reduce behavior that places teens at risk of pregnancy or STD. Effective programs include both those that address sexual risk and protective factors (e.g., sex and STD/HIV education programs) and those that address non-sexual factors (e.g., service learning programs). This variety increases the choices available to communities that want to reduce teen pregnancy and STD.

☆ In part because sex and STD/HIV education programs have been studied the longest period of time and have the greatest number of studies evaluating them, they have the greatest amount of evidence that about two-thirds of them can reduce sexual risk behavior among important groups of teens.

☆ However, other types of programs also have evidence that one or more programs were effective at reducing sexual risk behavior. These include programs for parents (especially when they have components for their teens); long interactive videos viewed multiple times; changes in one-on-one clinic protocols that give a clear message about behavior and discuss barriers to responsible behavior; the provision of emergency contraception in advance; some community-wide initiatives to prevent pregnancy or STD/HIV; service learning programs; and some intensive and comprehensive youth development programs that give a clear message about sexual risk behavior.

☆ Programs that target *sexual* factors must do so clearly and directly. Programs that target *nonsexual* factors must intervene intensively in the lives of young people, motivating them to avoid pregnancy and childbearing or simply giving them less opportunity to engage in unprotected sex.

# Taking Stock: Conclusions about the State of Research and Effects of Programs

What conclusions emerge from the multitude of studies on the effects of programs designed to prevent teen pregnancy and STD/HIV? And how should those conclusions guide program design, implementation, and evaluation in the future? This chapter offers conclusions in two areas—the state of research and the effectiveness of existing programs—and provides a look into future needs. Chapter 10 offers strategies for using these conclusions in community programs.

## THE STATE OF RESEARCH

At least four shortcomings limit the conclusions that can be drawn from the studies in this review. First, although more than 100 studies have examined the impact of programs on sexual risk-taking, pregnancy, childbearing, or STDs, many additional approaches to prevention have not been evaluated sufficiently, if at all. Moreover, it is not appropriate to reach conclusions about an entire approach to pregnancy or STD prevention on the basis of one or even a handful of studies. This is especially true when programs are implemented in different settings, because their success may vary with the setting and the group targeted.

Second, evaluations of only a few programs have been replicated. While replications of most comprehensive sex and STD/HIV education programs are very encouraging, attempted replications of one youth development program did not reproduce the desired effects. In addition, only a few programs have been found effective in multiple studies conducted by independent research teams. This calls into question our ability to make general statements about the effectiveness of some types of programs that have not been replicated.

Third, many of these studies were limited by methodological problems or constraints. Some studies did not use experimental designs (and therefore may have suffered from selection bias); some had sample sizes that were too small (and therefore may have failed to find programmatically important results to be statistically significant outcomes); produced anomalous results; or had very large confidence intervals, indicating that the findings were likely to have resulted in part from chance; some compared teens in one geographic area with teens in another area; some had low retention rates; some searched for positive results rather than stating a hypothesis and then reporting results; some failed to control for clustering of teens (and thereby exaggerated the statistical significance of results); and some failed to report and publish negative results. For these reasons, published results are undoubtedly biased in multiple, unknown ways.

Fortunately, some of these biases tend to cancel each other in the aggregate. Many of the methodological limitations identified above might produce significant positive results when a program actually had no impact. Offsetting this bias is the fact that at least half of the studies were statistically underpowered, which would result in reports of nonsignificant results when a program actually had programmatically important effects.

Fourth, some results were inconsistent. That is, some programs appeared to affect behavior, while other, seemingly similar programs did not. When such inconsistencies occur, it is difficult to know whether they result from methodological differences in the studies, differences in program implementation, or differences in the young people in particular settings at particular times.

As a result of these shortcomings, conclusions about the impact of programs must be tempered. In a field as contentious as teen pregnancy and STD prevention, it is important to be clear about the extent to which conclusions about programs are supported by research evidence.

To produce more definitive conclusions about what works, the research community needs to:

☆ Continue to identify and evaluate programs that appear promising but that have not been evaluated well, including, for example, abstinence programs, clinic outreach efforts, preschool interventions, additional types of youth development programs, mass media programs, and programs to encourage testing for and treatment of STDs.

☆ Conduct basic research in related areas that may help in the development of new approaches to reducing teen pregnancy. Such areas of research might include methods of preventing and dealing with sexual abuse, discouraging romantic relationships with much older partners, addressing other factors that affect early voluntary sexual activity, reducing the number of sexual partners and concurrent partners, increasing the consistent use of condoms and other contraceptives, understanding the role of different aspects of sexual networks, involving teenage boys and young men in programs, identifying the important characteristics of effective youth development programs, and improving the life options of young people, especially those who are poor or otherwise disadvantaged.

☆ Identify rigorous studies of programs in other fields (e.g., substance abuse prevention, violence prevention, and youth development programs) that may have data on fertility or STDs. Encourage new studies in those fields that would include measures of sexual behavior, fertility, or STD, thereby expanding the range of programs that may help to reduce teen pregnancy and STDs.

- Improve the quality and rigor of research studies.

- Use experimental designs with random assignment of participants.

- Use much larger samples so that studies have sufficient statistical power to analyze data from important subgroups (e.g., those who have had sex versus those who have not, or teenage boys versus teenage girls).

- Track young people in intervention and comparison groups for at least a year, preferably longer.

- Maintain adequate response rates.

- Measure actual sexual and contraceptive behavior as opposed to only risk and protective factors.

- Measure impact on pregnancy and STD rates whenever appropriate (e.g., when there is sufficient statistical power), and use laboratory tests instead of self-reports to measure pregnancy and STD rates whenever possible.

- State primary hypotheses ahead of time and report results regardless of whether they are positive or negative.

- Conduct proper statistical analyses that adjust for covariates, clustering, and multiple tests of significance.

- Whenever possible, have independent parties conduct evaluations.

☆ Determine how overlapping concepts—especially psychosocial concepts and other risk and protective factors—relate to each other and use agreed-upon measures more consistently across studies so that the effects of different programs can be more easily compared.

☆ Include mediational analyses to better determine which risk and protective factors are

affected by programs and, in turn, change behavior.

- ☆ Identify the most important messages about sexual behavior and the most effective ways of presenting them to young people.
- ☆ Provide much more complete program descriptions in published articles, as well as more informative process evaluations, to help reviewers ascertain why some programs were effective and others were not. If the descriptions are too long for professional journals, they should be made readily available to interested parties upon request.
- ☆ Identify programs that yielded positive behavioral results in one study and reevaluate them in different communities, cultures, and contexts with different program and research teams to determine their success under different conditions.
- ☆ Identify which components or characteristics of effective programs are critical to their success and which can be changed without significantly reducing impact.
- ☆ Conduct research to improve our understanding of how to replicate *with fidelity* programs found to be effective in two or more studies. To the extent feasible, identify the core components of the programs' content, instructional methods, and implementation.
- ☆ Conduct research to determine how and to what extent effective programs can be adapted to local conditions without significantly reducing their impact.
- ☆ Investigate the cost effectiveness of different kinds of successful approaches to reducing teen pregnancy and STD.

## EFFECTS OF PROGRAM

Despite the caveats expressed above, the patterns of results from existing studies warrant several general conclusions about the effects of programs:

- ☆ *Both the studies of risk and protective factors and the evaluations of programs indicate that no single, simple approach will dramatically reduce teen pregnancy and STDs across the United States.* While a number of effective programs have been identified, there are no "magic bullets." If teen pregnancy and STD prevention programs and initiatives are to have marked effects, they may need to combine several effective components that address both the sexual factors affecting behavior (such as values about abstinence and attitudes about condom and other contraceptive use) as well as the nonsexual factors (such as community poverty, lack of opportunity, family disorganization, peer norms, attachment to school, substance abuse, and general risk-taking). This is particularly true for more disadvantaged adolescents.
- ☆ *Both the studies of risk and protective factors and the evaluations of programs clearly demonstrate that multiple, quite different approaches can help reduce behavior that places teens at risk of pregnancy or STD.* This review identifies 21 different types or subtypes of programs, and all but one of them (welfare reform for adults) was found by at least one study to have a positive impact on some sexual behavior. Thus, there are no single answers to the problems of pregnancy and STD: there are multiple answers.
- ☆ *Programs that reduce sexual risk-taking, pregnancy, childbearing, or STDs fall into three groups: those that address the sexual risk and protective factors influencing sexual risk-taking (e.g., school- or community-based sex and STD/AIDS education programs and some health clinic programs), those that address primarily nonsexual risk and protective factors (e.g., service learning programs), and those that address both groups of factors (e.g., the* Children's Aid Society-Carrera Program*).*
- ☆ *Abstinence and use of condoms and other forms of contraception are compatible goals and topics.* There are two ideas behind this simple statement. First, the overwhelming weight of the evidence demonstrates that programs that focus on sexuality and discuss contraception, including sex and STD/HIV education programs, school-based clinics,

and condom-availability programs, do not increase sexual activity. The rare study that finds an increase in any measure of sexual activity would be expected by chance. Furthermore, a number of programs that discussed condoms or other forms of contraception and encouraged their use among sexually active teens also delayed or reduced the frequency of sexual intercourse. Second, programs that emphasized abstinence, that gave it clear prominence, and that presented it as the safest and best approach while also emphasizing condoms or other contraceptives for sexually active teens did not decrease the use of condoms or other contraceptives and sometimes increased their use. Thus, giving appropriate emphasis to both abstinence and contraception does not have the negative effects that people sometimes fear, and it can, in fact, have several positive effects.

☆ *Studies of some comprehensive sex and STD/HIV education programs have produced strong evidence that they reduce sexual risk-taking by delaying the initiation of sex, reducing the frequency of sex, reducing the number of sexual partners, or increasing the use of condoms or other forms of contraception.* Some programs have positive effects on more than one type of behavior, and some positive effects can endure for as long as 31 months. Programs have been found to be effective in advantaged and disadvantaged communities, with both genders, all major racial and ethnic groups, younger and older teens, and sexually experienced or inexperienced teens. Multiple studies indicate that when these programs are implemented and evaluated by other people in other communities or even other states, they continue to have positive effects, provided they are implemented with fidelity in similar settings with similar populations. Sex and STD/HIV curricula that incorporate the 17 characteristics of effective programs are especially likely to be effective.

☆ *Programs that stress abstinence as the only acceptable behavior for unmarried teens have little evidence of delaying the onset of sex or reducing other aspects of sexual behavior. Well-designed studies of abstinence-until-marriage programs have consistently found no significant impact on sexual behavior.* However, because abstinence-until-marriage programs are so diverse, one should not conclude that all of them are ineffective. At the same time, there is currently no strong evidence that any abstinence-until-marriage program can delay the initiation of sex.

☆ *Programs for parents and their teens sometimes reduce sexual risk-taking among teens by delaying sex or increasing condom use, especially when the programs include educational components for teens that incorporate many of the 17 characteristics of effective curriculum-based programs for youth.* Too little evidence is available to gauge the impact on teen sexual behavior of programs for parents only. Also, getting parents and their teens to participate in parent or parent-teen programs remains a challenge.

☆ *While short, noninteractive, stand-alone videos have no significant impact on behavior, videos that are longer, interactive, and viewed many times can affect some behavior, possibly for as long as six months.*

☆ *Family planning clinics probably prevent a large number of teen pregnancies, although remarkably little experimental evidence is available to support this view.* Each year, many sexually active adolescent girls attend family planning clinics or visit private physicians to obtain prescription contraceptives, which are more effective than over-the-counter contraceptives. Moreover, when the number of publicly funded reproductive health providers increases and more young people have access to low-cost, confidential sources of contraception, more of them obtain contraception from these providers. All else being equal, when more teens obtain and use contraceptives, fewer of them become pregnant. Nonexperimental studies have estimated that tens or hundreds of thousands of pregnancies are prevented by family planning services each year; the estimates vary, depending on assumptions about how teens would behave if prescription contraceptives were not available. Few studies have examined the impact of subsidized family planning services on pregnancy or birth

rates, and those that have are very limited methodologically.

☆ *Several studies have consistently indicated that when clinics provide improved educational materials, discuss the patient's sexual and condom or contraceptive behavior one-on-one, send a clear message about that behavior, and incorporate other components into the clinic visit, they can increase condom or contraceptive use by teens, although not necessarily for a prolonged period.*

☆ *Teenage girls and young women who receive emergency contraception from clinics in advance of having sex are not more likely to have sex, but they are more likely to use emergency contraception if they do have sex.*

☆ *School-based and school-linked clinics and school condom-availability programs do not increase sexual activity, but it is not clear whether they increase the use of condoms and contraceptives.* Substantial percentages of sexually experienced female students in schools with school-based clinics obtain contraceptives from such clinics. Similarly, students obtain large numbers of condoms from school, as long as the school provides them in private locations and with few restrictions. Studies have consistently shown that making condoms or other contraceptives available in schools does not hasten or increase sexual behavior. However, studies measuring the impact of school-based clinics and school condom-availability programs on contraceptive use have produced mixed results: a few found increases in condom or contraceptive use, but most did not. Notably, school-based or school-linked clinics that focused on the use of contraceptives and sent a clear message about abstinence and contraception may have delayed sex and increased the use of contraceptives, while other clinics did not.

☆ *The small number of studies measuring the impact of community-wide initiatives and collaborations to reduce teen pregnancy found mixed results, although more than half found positive effects on sexual risk, and the most intensive program even reduced teen pregnancy over many years.* All but one of these studies were population-based, which presented their respective programs with a very challenging goal: significantly changing the behavior of all the young people in the targeted communities, not just the behavior of those who participated in the program.

☆ *In schools, clinics, and community programs, in groups and one-on-one counseling sessions, and with individual interactive media programs, programs can increase teens' knowledge about sexual behavior and its consequences, increase their perception of the risk of STDs, change their values and attitudes about abstaining from sex and using condoms or other forms of contraception, change their perception of peer norms about sex and contraceptive use, increase their confidence that they can avoid sex or use protection, or increase their intention to abstain from sex or to use protection. Such changes can actually change teens' sexual and contraceptive behavior.*

☆ *Effective programs that target sexual risk and protective factors share at least two common attributes: they focus clearly on sexual behavior and condom or contraceptive use, and they send clear messages about abstaining from sex or using protection against STDs and pregnancy.* These qualities characterized the effective school- and community-based sex and STD/HIV education programs, the effective school-based clinic programs, the effective school-linked programs, and even the effective community collaborations. Programs that addressed sexual risk and protective factors but did not present clear messages about abstinence and the use of contraception appeared to be less effective.

☆ *Welfare reform policies and programs that require parents to work or participate in activities to increase their employability, that provide extra income to parents who were or became voluntarily employed, and that impose time limits on the receipt of cash assistance do not affect adolescent childbearing.*

☆ *Service learning programs have evidence that they actually reduce teen pregnancy rates.* Service learning programs have been evaluated multiple times, in many communities, by

different investigators and have been found to reduce sexual risk-taking or pregnancy. This is encouraging. However, it is unclear whether these programs reduce teen pregnancy beyond the academic year in which the students participate in them. Notably, the programs did not always focus on sexual risk and protective factors influencing the use of condoms or other contraceptives, and some were not even designed to reduce teen pregnancy. However, the programs were intensive: teens participated in them for many hours and often for prolonged periods. In addition to their success in reducing teen pregnancy, some of the programs had other positive results, such as reducing failure in school.

☆ *Some other youth development programs (such as vocational education programs) did not reduce teen pregnancy or childbearing even though they focused on seemingly important nonsexual factors (basic reading, writing, and math skills and preparation for employment), were relatively intensive, and lasted a long time.*

☆ *Other youth development programs, such as strong preschool child-care programs, programs to improve the quality of teaching in elementary school and student attachment to school, and very comprehensive and intensive youth development programs, have produced a few encouraging results, but there are too few studies and too many important study limitations to reach any conclusions.*

☆ *Even modest interventions that address both sexual and nonsexual risk and protective factors may reduce sexual risk-taking and pregnancy among teens. A majority of such interventions reduced one or more types of risky sexual behavior.*

☆ *However, intensity, quality, and continuity may be factors that enable programs to produce long-term positive effects on pregnancy rates. Both of the programs that actually reduced teen pregnancy for many years (the CAS-Carrera Program and the program in Denmark, South Carolina) were very intensive and involved teens continually for many years. Service learning programs also involved young people intensively, and they reduced pregnancy while teens were involved in them.*

These conclusions indicate that programs may be effective at reducing teen pregnancy and STD/HIV both when they focus clearly on sexual behavior *and* when they do not address sexuality at all. Programs that target *sexual* factors must do so clearly and directly. For example, they may discuss with teens realistic situations that could lead to unprotected sex and methods for avoiding those situations, for remaining abstinent, and for using condoms and other contraceptives. Programs that target *nonsexual* factors must intervene intensively in the lives of young people, motivating them to avoid pregnancy and childbearing or simply giving them less opportunity to engage in unprotected sex. Finally, the *CAS-Carrera Program* demonstrates that addressing both sexual and nonsexual factors can be very effective.

All in all, these findings bring good news because they show that programs with very different approaches to reducing sexual risk-taking are emerging. This variety increases the choices available to communities that want to reduce teen pregnancy and STD.

## LOOKING FORWARD

Our understanding of the factors that affect sexual risk-taking, pregnancy, and STD among U.S. teens continues to grow and to broaden. Evaluations of specific programs continue to accumulate, and the quality of these studies continues to improve markedly. More important, the number of programs that show evidence of bringing about positive behavioral change continues to increase, and the strength of that evidence is improving. In just the last six years, several rigorous studies with random assignment demonstrating long-term effects on teen sexual behavior have been published, as have multiple replications of studies with positive results. Most important, pregnancy and childbearing rates have declined every year since 1991. Certainly, much remains to be learned, but there are now many partial answers to the question: What works? Adults who work with teens should feel proud of their contribution to this success.

Nonetheless, we must not become complacent. The evidence of success, though greatly improved, is still not as strong as it should be. Most programs, even those found to be effective, typically have a modest impact on behavior. And teen pregnancy and STD rates in the United States are still much too high, both in terms of international standards and in terms of the well-being of the teens and infants involved. In addition, there remain huge racial and ethnic disparities in pregnancy and STD rates that reflect, in part, disparities in education and economic opportunity, access to health care, and other factors. While teen pregnancy and STD rates need to decline among all teens in the United States, they need to decline even more among some groups of teens.

Relatively few American teens participate in the kinds of programs that have shown evidence of success, and experience shows that it is not always easy to replicate successful programs with fidelity. But faithful replication of successful programs desperately needs to be done. In addition, the number of teenagers in the United States is expected to grow rapidly during the coming years, placing a much greater demand on all programs that serve young people. Clearly, effective programs and services must be expanded rapidly to meet their needs.

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**THE FOLLOWING THREE STRATEGIES WILL INCREASE THE CHANCES THAT THE PROGRAM AN ORGANIZATION SELECTS, DESIGNS, OR ADAPTS WILL REDUCE RISKY SEXUAL BEHAVIOR AMONG TEENS:**

- ☆ Whenever possible, implement with fidelity programs demonstrated to be effective with similar populations.
- ☆ Select or design programs that incorporate the important characteristics of programs that have been effective with similar populations.
- ☆ Design new programs by completing the five activities typically completed by people who have designed effective sex and STD/HIV education programs.

# Bringing It Home: Applying Research Results in Communities

How can an organization use the research findings described in this review and the conclusions drawn from them to select, adapt, or design programs to reduce sexual risk-taking, pregnancy, and STD/HIV among teens? Several excellent, detailed guides are available to help (see Box 10.1). But before choosing what type of program to put in place, organizations need to consider both what their teens need and what resources the community already offers. Several of the most important considerations are:

- ☆ The community's concerns about teen pregnancy versus teen STDs, including HIV
- ☆ The actual sexual and contraceptive behavior of teens in the community
- ☆ The barriers teens face in remaining abstinent or using condoms or other forms of contraception, as well as the risk and protective factors that affect their sexual behavior
- ☆ Community values regarding teens' abstinence, sexual behavior, and condom and other contraceptive use
- ☆ The quality of existing abstinence and sex and STD/HIV education programs in the schools and in other organizations that work with teens
- ☆ The availability of condoms and reproductive health services
- ☆ The extent to which most health care providers address teen sexual behavior and how they do so
- ☆ The availability of employment opportunities, the quality of schools, the stability and closeness of families, the monitoring and supervision of teens, and the existence of programs for teens
- ☆ The need for and interest in youth development programs for teens
- ☆ The resources—staff, organizational, and monetary—available to implement different kinds of new programs.

With such considerations in mind, organizations should adopt the following three strategies to increase the chances that the programs they select, adapt, or design on their own will actually reduce sexual risk-taking, pregnancy, or STD/HIV among teens:

- ☆ Implement with fidelity programs found to be effective for similar populations of teens
- ☆ Select or design programs that incorporate the key characteristics of programs found to be effective for similar populations
- ☆ Complete the five activities typically completed by designers of effective sex and STD/HIV education programs

## IMPLEMENT WITH FIDELITY PROGRAMS FOUND TO BE EFFECTIVE FOR SIMILAR POPULATIONS

The single most promising strategy for reducing teen pregnancy and STD/HIV is to implement with fidelity programs that have been demonstrated to be effective in other places with similar young people. If a program shows

## Box 10.1: Guides to Selecting, Designing, and Implementing Pregnancy and STD/HIV Prevention Programs


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Klerman, K. (2004). *Another chance: Preventing additional births to teen mothers.* Washington, DC: National Campaign to Prevent Teen Pregnancy. https://www.teenpregnancy.org/store/item.asp?productId=281

Kreinin, T., Kuhn, S., Rodgers, A. B., & Hutchins, J. (Eds.). (1999). *Get organized: A guide to preventing teen pregnancy.* Washington, DC: National Campaign to Prevent Teen Pregnancy.

Manlove, J., Franzetta, K., McKinney, K., Romano Papillo, A., & Terry-Humen, E. (2004). *A good time: After-school programs to reduce teen pregnancy.* Washington, DC: National Campaign to Prevent Teen Pregnancy. http://www.teenpregnancy.org/works/pdf/goodtime.pdf

Manlove, J., Franzetta, K., McKinney, K., Romano Papillo, A., and Terry-Humen, E. (2004). *No time to waste: Programs to reduce teen pregnancy among middle school-aged youth.* Washington, DC: National Campaign to Prevent Teen Pregnancy. http://www.teenpregnancy.org/works/pdf/NotimetoWaste.pdf

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*Science-based practices: A guide for state teen pregnancy prevention organizations.* (2004). Washington, DC: Advocates for Youth. http://www.advocatesforyouth.org/publications/frtp/guide.htm

*Solomon, J., & Card, J. J. (2004). Making the list: Understanding, selecting, and replicating effective teen pregnancy prevention programs.* Washington, DC: National Campaign to Prevent Teen Pregnancy. http://www.socio.com/pasha.htm#overview

strong evidence of reducing sexual risk-taking or teen pregnancy or STDs, if the target population is similar, and if the program is implemented in the same type of setting, then the chances are quite good that the results will be similar. If the program was found by several studies to be effective when implemented in different communities by different, independent groups, the chances of success are even greater.

When implementing programs, it may be useful to follow the four implementation guidelines found to be important in effective programs (see Chapter 7). Those four guidelines are:

- ☆ Secure at least minimal support from appropriate authorities, such as departments of health or education, school districts, or community organizations
- ☆ Select educators with desired characteristics (whenever possible), train them, and provide monitoring, supervision, and support
- ☆ If needed, implement activities to recruit and retain teens and overcome barriers to their involvement (e.g., publicize the program, offer food, or obtain consent)
- ☆ Implement virtually all activities with reasonable fidelity

While these guidelines are consistent with both common sense and professionals' experience—and may therefore be considered obvious—it is nevertheless true that some programs have failed to be effective because they did not follow them.

A critical question remains: What *are* the most effective programs to reduce teen pregnancy and STD/HIV? Unfortunately, that question cannot be answered definitively because thousands of programs exist and most of them have never been evaluated. Furthermore, the programs that have been evaluated have not been compared directly with each other in an experimental design. Typically, they have served different groups at different times, and it is simply not possible to determine which are the most effective, either in general or in particular populations of teens.

It is possible to answer a related question, however: Which programs show the *strongest evidence* of delaying sex, increasing condom or contraceptive use, or reducing pregnancy, childbearing, or STDs? This review has identified 15 very different programs or initiatives that show strong evidence of effectiveness in different settings. The 15 programs are listed in Table 10-1 and summarized briefly in Box 10.2.

To be included in the list, a program must meet either of two conditions. A single study must have found compelling evidence that the program produced positive effects—and no negative effects—on teen sexual behavior. The study must have had an experimental design with random assignment of teens to experimental and control groups, a large sample size, strong statistical analyses, and important, statistically significant positive effects on behavior for at least one year or statistically significant positive effects on either teen pregnancy or STD rates for at least nine months. The positive results can occur either among all teens or teens of either gender. Fourteen programs met this condition. Alternatively, each of several studies must have found slightly less strong evidence that the program produced positive effects—and no negative effects—on behavior. Each study must have had at least a quasi-experimental design with intervention and comparison groups and with baseline and follow-up data, acceptable sample size, acceptable statistical analyses, and important, statistically significant positive effects on behavior for at least one year or pregnancy or STD rates for nine months among either or both genders. In addition, the studies must have been conducted by different research teams. One program, *Reducing the Risk*, met this condition. Four separate quasi-experimental studies conducted by three different research teams showed that it had a positive impact on teen sexual behavior.

When viewing the list of 15 programs, it should be recognized that the programs that are marketed today may differ in modest or substantial ways from the programs that were originally evaluated. If the newer versions were modified substantially, then it is less certain that they will be effective.

## Table 10-1: Programs with Strong Evidence of Positive Impact on Sexual Behavior or Pregnancy or STD Rates

| | | Primary Focus | | | Setting | | Race/ Ethnicity | | | | Grade/ Age | | Gender | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Type of Program | Impact on behavior replicated in subsequent studies | Pregnancy | STD/HIV | Both | Schools | Community settings, clinics, or after school | Non-Hispanic white | African-American | Hispanic | Mixed | Junior high or under age 15 | Senior High or age 15 and older | Boys only | Girls only | Both |
| **Curriculum-Based Sex and STD/HIV Education Programs** | | | | | | | | | | | | | | | |
| Becoming a Responsible Teen: An HIV Risk Reduction Program for Adolescents [1] | X | | X | | | X | | X | | | | X | | | X |
| ¡ Cuídate! (Take Care of Yourself ) The Latino Youth Health Promotion Program [2] | | | X | | | X | | | X | | | X | | | X |
| Draw the Line, Respect the Line [3-5] (Implemented with both genders; found effective for boys only) | | | | X | X | | | | X | X | X | | | | X |
| Making Proud Choices: A Safer Sex Approach to HIV/STDs and Teen Pregnancy Prevention [6] | X | | | X | | X | | X | | | X | | | | X |
| Reducing the Risk: Building Skills to Prevent Pregnancy, STD & HIV [7] | X | | | X | X | | X | | X | X | | X | | | X |
| Safer Choices: Preventing HIV, Other STD and Pregnancy [8-11] | | | | X | X | | X | X | X | X | | X | | | X |
| SiHLE: Sistas, Informing, Healing, Living, Empowering [12] (Implemented and effective for girls only) | | | | X | | X | | X | | | | X | | X | |
| **Mother-Adolescent Programs** | | | | | | | | | | | | | | | |
| Keepin' It R.E.A.L.![13][2] | | | | | | X | | X | | | X | | | | X |
| **Clinic Protocols and One-on-One Programs** | | | | | | | | | | | | | | | |
| Advance provision of emergency contraception (Implemented and effective for girls only)[3] | X | X | | | | X | | | | X | | | | X | |
| Reproductive Health Counseling for Young Men [14] | | X | | | | X | X | | | | | X | X | | |
| **Community Programs with Multiple Components** | | | | | | | | | | | | | | | |
| HIV Prevention for Adolescents in Low-Income Housing Developments [15] | | | X | | | X | | X | | X | | X | | | X |
| **Service Learning[4]** | | | | | | | | | | | | | | | |
| Reach for Health Community Youth Service Learning [16] | | | | X | X | X | | X | X | | X | | | | X |
| Teen Outreach Program (Implemented with both genders; evaluated and found effective for girls only)[17] | | | | X | X | | | X | | X | | | | | X |
| **Multi-Component Programs with Intensive Sexuality and Youth Development Components** | | | | | | | | | | | | | | | |
| Aban Aya [18](Implemented with both genders; found effective for boys only) | | | | X | X | X | | X | | | X | | | | X |
| Children's Aid Society Carrera Program [19] (Implemented with both genders; found effective for girls only) | | X | | | | X | | X | X | | X | X | | | X |

## Table 10-1: Programs with Strong Evidence of Positive Impact on Sexual Behavior or Pregnancy or STD Rates (Con't.)

| | Behavioral Outcomes[1] | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Type of Program | Delayed sex | Reduced frequency of sex | Reduced number of partners | Increased condom use | Increased contraceptive use | Decreased unprotected sex | Decreased pregnancy rate | Decreased STD rate |
| **Curriculum-Based Sex and STD/HIV Education Programs** | | | | | | | | |
| Becoming a Responsible Teen: An HIV Risk Reduction Program for Adolescents [1] | X | X | | X | | X | | |
| ¡ Cuídate! (Take Care of Yourself ) The Latino Youth Health Promotion Program [2] | | X | X | X | | X | | |
| Draw the Line, Respect the Line [3-5] (Implemented with both genders; found effective for boys only) | X | X | X | | | | | |
| Making Proud Choices: A Safer Sex Approach to HIV/STDs and Teen Pregnancy Prevention [6] | | | | X | | X | | |
| Reducing the Risk: Building Skills to Prevent Pregnancy, STD & HIV [7] | X | | | X | X | X | | |
| Safer Choices: Preventing HIV, Other STD and Pregnancy [8-11] | | | | X | X | X | | |
| SiHLE: Sistas, Informing, Healing, Living, Empowering [12] (Implemented and effective for girls only) | | | X | X | | X | X | X |
| **Mother-Adolescent Programs** | | | | | | | | |
| Keepin' It R.E.A.L.![13][2] | | | | X | | | | |
| **Clinic Protocols and One-on-One Programs** | | | | | | | | |
| Advance provision of emergency contraception (Implemented and effective for girls only)[3] | | | | | X[3] | | | |
| Reproductive Health Counseling for Young Men [14] | | | | | X | | | |
| **Community Programs with Multiple Components** | | | | | | | | |
| HIV Prevention for Adolescents in Low-Income Housing Developments [15] | X | | | X | | | | |
| **Service Learning[4]** | | | | | | | | |
| Reach for Health Community Youth Service Learning [16] | X | X | | | | X | | |
| Teen Outreach Program (Implemented with both genders; evaluated and found effective for girls only)[17] | | | | | | | X | |
| **Multi-Component Programs with Intensive Sexuality and Youth Development Components** | | | | | | | | |
| Aban Aya [18](Implemented with both genders; found effective for boys only) | | X | | X | | | | |
| Children's Aid Society Carrera Program[5] [19] (Implemented with both genders; found effective for girls only) | X | | | | X | | X | |

1. To be included in this table, programs had to improve one or more types of behavior for at least one year or reduce pregnancy or STD rates for at least nine months. Behavioral effects for six or more months are recorded in the cells below.
2. A similar program for fathers and their sons is called *REAL Men*. An evaluation of it provided evidence of impact on delay in sex and greater condom use, but it is not included in this list because only seven Boys and Girls Clubs were randomly assigned to intervention groups.
3. The advance provision of emergency contraception increased only the use of emergency contraception, not contraception generally.
4. All of the service learning programs that have been evaluated, including *Reach for Health Community Youth Service, Teen Outreach Program,* and *Learn and Serve,* have found results suggesting a positive impact upon either sexual behavior or pregnancy. According to the evaluation of *TOP,* the particular curriculum used in the small-group component did not appear to be critical to the success of service learning. Evaluation of the *Learn and Serve* programs did not meet the criteria for inclusion here because it did not use an experimental design, but it did confirm the impact of service learning on pregnancy, especially among middle school youth.
5. This program has provided the strongest evidence of reducing pregnancy for three years as reported by girls. However, when not implemented in New York City it was less effective, and when not implemented with the benefit of *CAS-Carrera* training, materials, and oversight in one study, it was not effective.

## *Table 10.1 References*


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## Box 10-2, Brief Summaries of the 15 Programs with Strong Evidence of Behavioral Impact

### Programs That Focus Primarily on Sexual Factors

### Curriculum-Based Sex and STD/HIV Education Programs

☆ *Becoming a Responsible Teen* focuses primarily on preventing the sexual transmission of HIV. It was implemented in both a clinic setting and a residential drug treatment center, but it can be implemented in a variety of community settings, including schools. In the first study, it delayed the initiation of sex, reduced the incidence of sex, reduced the number of sexual partners, increased the use of condoms, and reduced the frequency of unprotected sex during a 12-month period. In the second study, it reduced the frequency of sex, the number of partners, and unprotected sex, and it increased condom use.

☆ *¡Cu1´date! (Take Care of Yourself ) The Latino Youth Health Promotion* Program focuses on STD/HIV and pregnancy prevention. It was implemented at school on Saturdays and reduced the frequency of sex, number of sexual partners, and frequency of and unprotected sex and increased consistent condom use over a one-year period.

☆ *Draw the Line, Respect the Line* focuses on preventing both pregnancy and STDs and was implemented in schools. It delayed the initiation of sex among boys for three years, increased abstinence during the previous year for three years, reduced the frequency of sex for two years, and reduced the number of sexual partners for two years.

☆ *Making Proud Choices: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* was implemented after school. It reduced the frequency of sex, increased the use of condoms, and reduced unprotected sex during a 12-month period. Slightly modified versions of this curricula were implemented and evaluated in other studies and communities and were found to be effective.

☆ *Reducing the Risk* focuses on preventing both pregnancy and STDs. Although designed for school settings, it has been implemented after school and in community settings. Four studies found that Reducing the Risk delayed the initiation of sexual intercourse, and two studies found that it also increased condom or contraceptive use among some groups. The results lasted up to 18 months, depending on the study.

☆ *Safer Choices: Preventing HIV, Other STD and Pregnancy* was implemented in high schools and included components for parents and the community. It increased condom and contraceptive use and decreased the frequency of unprotected sex over a 31-month period. Among Hispanic youth only, it delayed the initiation of sex.

☆ *SIHLE: Sistas, Informing, Healing, Living, Empowering* is designed for young African-American women and focuses primarily on preventing STDs. It was implemented in a health clinic, but could be implemented in a variety of community settings. It reduced the number of partners, increased condom use, and reduced unprotected sex for a year. For six months it also reduced the pregnancy rate and for a year it reduced the STD rate.

#### MOTHER-ADOLESCENT PROGRAMS

☆ *Keepin' It R.E.A.L.!* is a mother-adolescent pregnancy and STD/HIV prevention program implemented in Boys and Girls Clubs. For two years it increased condom use. (A similar program, *REAL Men,* is a father-son program also focusing on STD/HIV prevention. It was also implemented in Boys and Girls Clubs and both delayed sex and increased condom use among boys. However, the study assigned fewer clubs at random and therefore it does not meet the criteria for inclusion in this short list.)

#### CLINIC PROTOCOLS AND ONE-ON-ONE PROGRAMS

☆ *Advance provision of emergency contraception* is not really a program, but a change in clinic protocol to provide emergency contraception in advance to teenage young women before they have unprotected sex instead of providing it upon request after unprotected sex. It increased the use of emergency contraception during the following year.

## Box 10-2, Brief Summaries of the 15 Programs with Strong Evidence of Behavioral Impact (Con't.)

### Programs That Focus Primarily on Sexual Factors (Con't)

#### Curriculum-Based Sex and STD/HIV Education Programs (Con't)

☆*Reproductive Health Counseling for Young Men* was a pregnancy and STD/HIV prevention program implemented in clinics. It included a slide-tape program and one-on-one counseling with a clinic practitioner. It increased contraceptive use for a year.

**COMMUNITY PROGRAMS WITH MULTIPLE COMPONENTS**

☆*HIV Prevention for Adolescents in Low-Income Housing Developments* is a community program focused on HIV prevention that uses multiple components, including educational brochures, free condoms, skills training workshops, follow-up sessions, and community activities and events. It delayed the initiation of sex and increased condom use for 18 months.

### Programs That Focus Primarily on Nonsexual Factors

#### Service Learning

*Service learning* programs have been evaluated multiple times and have been consistently found to be effective at either delaying the initiation of sex or reducing teen pregnancy. All of the programs that have been evaluated were very intensive, lasting many months with many hours of structured time for participants. Because *no* studies have measured the impact of intensive service learning programs and found that they failed to have a positive impact on behavior, it may be that many intensive service learning programs are effective. Evaluation of the Learn and Serve programs did not meet the criteria for inclusion here because it did not use an experimental design, but it did confirm the impact of service learning on pregnancy, especially among middle school youth.

☆The *Reach for Health* service learning program was implemented in middle schools and nearby nursing homes, neighborhood clinics, child day care centers, and a senior citizen center. It delayed the onset of sexual intercourse and reduced sexual activity for as long as three years.

☆The *Teen Outreach Program (TOP)* was implemented in school classes and in the surrounding communities. *TOP* reduced reported teen pregnancy rates during the academic year in which teens participated. Results of the evaluation indicate that it was the service learning component and not the content of the curriculum that produced the positive effects.

### Programs That Focus on Both Sexual and Nonsexual Factors

#### Multi-Component Programs with Intensive Sexuality and Youth Development Components

☆*Aban Aya* includes about 20 classroom lessons per year in grades 5-8 plus other parental, school and community components. Among boys only, it reduced the incidence of sex and increased condom use.

☆The *Children's Aid Society-Carrera Program* is an intensive, comprehensive, long-term program with multiple components. It is the only program with strong evidence that, among teenage girls, it delayed sex, increased simultaneous use of condoms and other more effective contraceptives, and reduced both pregnancy and birth rates. Furthermore, the program had very long term effects—that is, effects that lasted three years after girls joined the program. It did not have significant positive effects on the sexual behavior of boys. When another organization tried to implement the program without the benefit of *CAS-Carrera materials,* training or oversight, they found it quite challenging; they may not have been able to implement all components of the program with fidelity, and they failed to find positive effects. This indicates that the program should be implemented with the materials, training, and oversight of the CAS-Carrera staff.

An important guide for assessing the kinds of changes that can be made to programs without jeopardizing their effectiveness will be available in the fall of 2007 [1].

Although Table 10-1 identifies the programs with the strongest evidence, a very important question remains: what is the magnitude of the impact of these programs? How much do they improve teen sexual behavior? That question is also surprisingly difficult to answer. On the one hand, each of the programs had a meaningful impact on behavior. For example, *Reducing the Risk* decreased the percentage of sexually inexperienced teens who subsequently engaged in unprotected sex by almost half, from 16 percent to 9 percent [2]. *Safer Choices* reduced the mean number of acts of sexual intercourse not protected by a condom from 3.82 times in a three-month period to 2.44 times, a drop of 37 percent [3]. *Making Proud Choices: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* decreased the percentage of young people who reported having had unprotected sex during the previous month from 10.8 percent to 5.4 percent, a 50 percent reduction, and the mean number of acts of unprotected intercourse during the previous month from .51 to .17, a 67 percent reduction [4]. *Becoming A Responsible Teen* cut the percentage of sexually inexperienced teens who initiated sex during a 12-month period from 31 percent to 12 percent, a 63 percent reduction [5]. *SiHLE: Sistas, Informing, Healing, Living, Empowering* increased the consistent use of condoms by about 30 percent [6]. The *Reach for Health* service learning program decreased the percentage of teens who initiated sex from 27 percent to 19 percent, a 29 percent reduction [7]. Finally, the *Children's Aid Society-Carrera Program* reduced the pregnancy rate reported by girls after three years in the program, from 22 percent to 10 percent, a 55 percent reduction [8]. All of these reductions are very encouraging.

However, for several reasons, these improvements in behavior are somewhat misleading, and organizations seeking to replicate these programs should not expect to obtain such positive results. First, while all of these results measure important aspects of sexual risk-taking or pregnancy, they are among the largest effects found in each study—that is, the programs did not have as great an effect on other types of behavior. For example, *Reducing the Risk* did not have as large or significant an impact on frequency of sex as it did on the frequency of unprotected sex, and *Making a Difference: A Safer Sex Approach to STD, Teen Pregnancy, and HIV/AIDS Prevention* did not have as large an impact on delaying the initiation of sex as it did on reducing unprotected sex. Second, while all of the results were statistically significant, they all had rather large confidence intervals, meaning that chance probably enhanced the magnitude of some of them. (In theory, chance could either enhance or diminish results, but since these results were among the largest effects, it is likely that chance had a positive effect.) Replications of these programs would be likely to report smaller effects.

Although these 15 programs show the *strongest* evidence of success and the estimated magnitude of their success is impressive, it is important to emphasize that they are not the *only* programs in the United States that have been shown to have a positive impact on adolescent sexual behavior. Chapters 6 and 8 identify numerous other programs that changed behavior in desired directions, but the strength of the evidence for their effects is not as strong. And, as noted above, there are undoubtedly many effective programs that simply have not been evaluated. In the future, other programs will meet the specified criteria and can be added to this list.

When selecting programs to implement, should organizations confine themselves to the 15 with the strongest evidence of effectiveness? Not necessarily. They should give these programs serious consideration, but they may want to consider other programs as well. After all, the 15 programs are not appropriate for all ages, they may not match the needs of particular groups, and they do not match the values or resources of all communities. And, of course, none of them eliminated sexual risk-taking, pregnancy, or STDs among teens. Dramatic reductions in teen pregnancy probably require community-

wide initiatives with a number of components to address the wide variety of sexual and nonsexual factors that influence adolescent sexual behavior (Chapter 3).

## SELECT OR DESIGN PROGRAMS WITH CHARACTERISTICS OF PROGRAMS FOUND TO BE EFFECTIVE FOR SIMILAR POPULATIONS

When it is not possible to implement programs that have been demonstrated to be effective, a second promising strategy is to select or design programs that incorporate the common characteristics of effective programs and that target similar populations.

Chapter 7 identifies 17 characteristics of effective sex and STD/HIV education programs. Most effective programs incorporated all, or nearly all, of the characteristics; more programs with the characteristics were effective; and programs with the characteristics were more likely to be effective than programs without them. The first two categories of characteristics pertain to the development and content of curricula and can be used to select effective curricula, while the third category pertains to the implementation of programs and can be used for that purpose.

It is not always easy to assess whether or not specific curricula incorporate the characteristics. Therefore, the *Tool to Assess the Characteristics of Effective Sex and STD/HIV Education Programs* was developed to help people undertake that assessment [9].

Research on other effective programs (such as the clinic-based and other programs described in Chapter 8) is not sufficiently advanced to identify a similar list of characteristics, but those programs do appear to share a few characteristics. First, nearly all of the effective programs that addressed sexual risk and protective factors focused clearly on changing particular types of sexual behavior and sent a clear message to teens about that behavior (i.e., to remain or become abstinent or to always use protection against pregnancy and STDs). A particularly good example is the group of clinic-based programs with modest clinician-patient interaction that sent a clear message to patients. Second, effective programs with youth development components (e.g., service learning programs and the *CAS-Carrera Program*) were very intensive and involved participants for many months, if not years. However, it is not known which characteristics or components of these programs—staff, duration of special classes, and so on—are critical to their success.

## DESIGN NEW PROGRAMS BY COMPLETING THE FIVE ACTIVITIES USED BY DESIGNERS OF EFFECTIVE PROGRAMS

If it is not possible or appropriate to implement an existing program that research has shown to be effective or one that incorporates the common characteristics of effective programs, organizations can adopt another strategy: they can develop their own programs, using the five activities completed by many designers of effective sex and STD/HIV education programs.

This third strategy is much more challenging and problematic than the first two because it involves actually developing a completely new intervention rather than implementing an existing one. However, this strategy is far more flexible than trying to build on the specific characteristics of other programs, and it can be combined with either of the first two strategies.

The five activities typically completed by the developers of effective sex and STD/HIV education programs are described briefly in Chapter 7. Here, they are described a bit more fully and are presented as guidelines for developing a wider range of programs.

### Activity 1. Include Individuals (and Sometimes Groups) with Expertise in Different Areas of Program Design

Include people with different backgrounds and expertise, especially in the areas of theory of health behavior, research on adolescent sexual

behavior and risk and protective factors affecting that behavior, theory of instructional or program design (how to change each risk and protective factor), elements of good program design, specific activities to change each risk and protective factor, cultural knowledge, and evaluation. Some persons may have expertise in more than one of these areas, but usually several people are needed. Often, it is important to include members of the community or organization involved.

### Activity 2. Assess the Needs and Assets of the Young People Targeted

Review quantitative data on pregnancy, HIV, and other STD rates, as well as any survey data on adolescent sexual behavior. To the extent feasible, review data on the teens to be targeted. Conduct focus groups or interviews with young people about their reproductive health concerns and interview adults who work with young people. Ask questions about why young people had sex, even if unwanted; pressures to have sex; and barriers to using condoms or other forms of contraception.

### Activity 3. Use a Logic Model Approach To Develop the Curriculum

Logic models are concise, causal descriptions of the mechanisms through which specific program activities can affect behavior. At a minimum, they must specify the health goals to be achieved, the types of behavior to be changed in order to achieve the health goals, the risk and protective factors that affect each type of behavior and that can be improved, and specific activities designed to change each selected risk and protective factor. A logic model also specifies the expected causal links among these four components. Logic models are sometimes called causal models or program models.

A detailed discussion of logic models is too technical for this report, but a guide to developing logic models for pregnancy and STD prevention programs is available [10], as is an extensive discussion of logic models and the processes for designing programs [11].

The four most important steps in developing a logic model are as follows:

1. *Specify the health goal(s) to be achieved.* Two potentially important health goals are reducing teen pregnancy and reducing STDs among teens in specific communities or groups. Depending on the magnitude of these problems, an organization may select one or both of these goals.

2. *Identify the types of behavior that must be changed in order to reach the desired health goal(s).* Three behavioral goals for reducing teen pregnancy are delaying the onset of sexual intercourse, reducing the frequency of sexual intercourse (including returning to abstinence), and increasing the use of effective contraception among those having sex. Four behavioral goals for reducing STD/HIV infection are delaying the onset of sexual intercourse, reducing the frequency of sex, reducing the number of sexual partners, and increasing the use of condoms. An organization might also wish to increase testing for and treatment of STDs, increase vaccinations for specific STDs, and encourage other behaviors discussed in Chapter 2. Ideally, behavioral goals should be determined by current measures of sexual risk-taking and should reflect the values and other goals of the community.

3. *Identify (to the extent feasible) the risk and protective factors most closely related to the sexual behavior you want to change in the targeted group, and then select the factors that can be changed.* Table 3.1 summarizes the most important factors affecting teen sexual risk-taking and pregnancy; other reviews have identified many additional factors [12]. Theories about how to change health behavior can also be helpful in selecting important determinants and understanding why they are important. Although informative and helpful, the factors listed in Table 3.1 and elsewhere are based on studies of teens in many different communities. To the extent possible, an organization should identify the most important factors affecting the sexual behavior of the teens it has targeted. Those factors are very likely

to be the same as many of the factors in the table, but they may differ slightly. Surveys and focus groups can help identify important factors in individual communities.

After identifying the most important risk and protective factors influencing the sexual behavior to be changed, an organization needs to select the factors it can actually change substantially with the resources available. For example, if the goal is to delay the initiation of sex among teens in a particular school, many important factors may be highly relevant (Table 3.1). However, program designers might find only a few factors in the community that are both amenable to change and highly related to the initiation of sex: namely, permissive attitudes toward sex, perceptions that peers have permissive beliefs about sex, the belief that peers are having sex, and confidence in ones ability to avoid unwanted sex. These are just examples; when designing effective programs, program designers typically need to select more than three factors.

4. *Identify specific program activities or components that will affect each factor selected.* Program activities should be sufficiently strong to change the selected risk and protective factors markedly. Ideally, each selected factor will be targeted by several program activities or components. Fortunately, some activities or components can affect more than one risk or protective factor. Considerable experience, theory, and research have been devoted to identifying what types of program activities affect what factors. For example, there is research describing what types of activities change perceptions of peer norms and increase self-efficacy.

In the example above, program designers might conduct a survey of students to measure their beliefs about adolescent sex and their actual sexual behavior. Such surveys often reveal that most teens believe it is a good idea to wait until they are older to have sex and that fewer teens have had sex than most of their peers think. If that is the case in this hypothetical community, the program activity that logically comes next is to present the survey findings to the students and discuss them in small groups in an attempt to counter the beliefs that peers favor early sex and everyone is having sex.

When the logic model is completed, it provides a detailed guide specifying what key program activities will be implemented, which factors they will affect, and which sexual behaviors will be modified by changing those factors. Consequently, the logic model can guide the development and implementation of the program, as well as later evaluations of it.

### Activity 4. Design Activities That Are Consistent with Community Values and Available Resources

Community values and organizational resources—including staff time, staff skills, facility space, and supplies—must also be taken into account when designing activities. For example, a community that values abstinence among young people should emphasize abstinence as the safest and best sexual behavior for adolescents. A community that supports contraceptive use among teens who do have sex should provide access to contraception and teach the skills to use it properly. If a program is being implemented in schools and the teachers in those schools can conduct role-playing, then role-playing should be used to teach teens how to avoid sex or how to insist on using condoms or contraception. If a community organization has the resources to implement programs for parents, service learning programs, or intensive, long-term youth development programs such as the *CAS-Carrera Program*, it should do so.

### Activity 5. Conduct Pilot Projects To Test the Program

Some or all of a program's activities or components should be tested in a pilot project before the program is implemented widely. This enables designers to assess informally what did or did not work and to make improvements. If possible, conduct evaluations during implementation and make further improvements.

## LOOKING AHEAD

In the coming years, organizations need not rely naively on simplistic solutions that have little chance of markedly reducing teen pregnancy. Instead, they can replicate much more broadly and with fidelity those programs with the greatest evidence of success, replicate more broadly programs that incorporate the common qualities of effective programs, and design and implement programs of their own, using the strategies of successful program developers. In addition, everyone concerned with reducing teen pregnancy and STD/HIV rates should continue to explore, develop, and rigorously evaluate promising approaches.

This is a hopeful time. Declining teen pregnancy and birth rates, combined with an increasingly robust body of research on the factors that affect sexual risk-taking by teens and on the impact of prevention programs, should increase Americans' confidence that we can continue to build on current success. The challenge will be to integrate what we learn from experience with what we learn from research and to use that knowledge to guide the development of more effective programs for teens. Such programs will help young people avoid pregnancy and STDs, make a successful transition to adulthood, and be ready to be the parents of the next generation.

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Douglas Kirby, Ph.D., is a Senior Research Scientist at ETR Associates in Scotts Valley, California. For 30 years, he has directed state-wide or nation-wide studies of adolescent sexual behavior, abstinence programs, sexuality and STD/HIV education programs, school-based clinics, school condom-availability programs and youth development programs. He co-authored research on the *Reducing the Risk, Safer Choices, Draw the Line and All4You!* curricula, all of which significantly reduced unprotected sex, either by delaying sex, reducing the number of partners, increasing condom use, or increasing contraceptive use. He has identified important behaviors that affect the sexual transmission of STDs, painted a more comprehensive and detailed picture of the risk and protective factors associated with adolescent sexual behavior, contraceptive use, and pregnancy, and identified important common characteristics of effective sexuality education and HIV education programs. In 1997 he authored *No Easy Answers: Research Findings on Programs to Reduce Teen Pregnancy* and in 2001, he authored *Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy.* In 2005, he completed a review of 83 studies of sex and HIV education around the entire world. Over the years, he has also authored or co-authored more than 100 volumes, articles and chapters on adolescent sexual behavior and programs designed to change that behavior. These have included reviews of the field for the National Campaign to Prevent Teen Pregnancy, the Centers for Disease Control, the National Institutes of Health, and the World Health Organization, among others. He has also conducted research in Ugand a on the factors leading to the reduction of HIV transmission in that country.

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The National Campaign to Prevent Teen and Unplanned Pregnancy seeks to improve the lives and future prospects of children and families and, in particular, to help ensure that children are born into stable, two-parent families who are committed to and ready for the demanding task of raising the next generation. Our specific strategy is to prevent teen pregnancy and unplanned pregnancy among single, young adults. We support a combination of responsible values and behavior by both men and women and responsible policies in both the public and private sectors.

If we are successful, child and family well-being will improve. There will be less poverty, more opportunities for young men and women to complete their education or achieve other life goals, fewer abortions, and a stronger nation.

*For many years, people concerned about preventing teen pregnancy have turned to The National Campaign to Prevent Teen and Unplanned Pregnancy for help in determining what programs are likely to work for the teens in their community.* Emerging Answers 2007 *offers such help.*

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